

# **Stakeholders' perspectives as key drivers of health information management optimization: A system interoperability and data linkage approach**

Tese de Doutorado

Tiago Filipe Tavares Costa

Doutoramento em

**Ciências Económicas e Empresariais**



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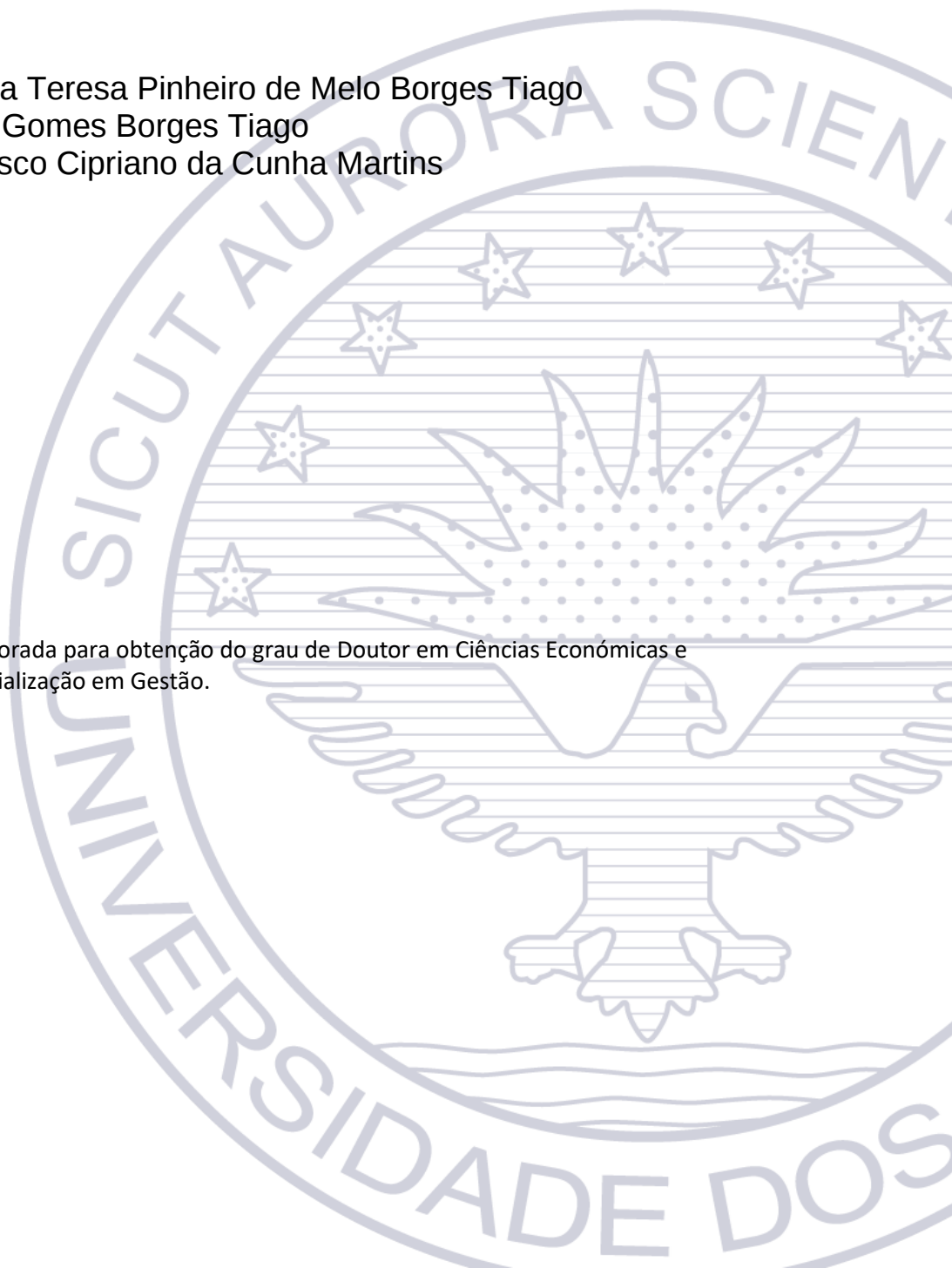
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## ABSTRACT

The complexity of healthcare provision is growing exponentially. Vast amounts of health data are generated and accumulated, imposing many health information management (HIM) and governance challenges to healthcare stakeholders. This research aims to evaluate the current state of the art in research about interoperability and data linkage within health data management and analyze the influence of healthcare stakeholders' perspectives on HIM optimization. To achieve the purposes of this research, a bibliometric analysis was performed, and an online survey about electronic systems to access healthcare data, based on the technology acceptance model and its extension with data utility, data importance, and data access barriers, was targeted at healthcare stakeholders living in the Azores (Portugal). PLS-SEM and one-way ANOVA provided the statistical outcomes. Findings from the bibliometric analysis identified three main clusters: (1) *e-health information stakeholder needs*; (2) *e-health information quality assessment*; and (3) *e-health information technological governance trends*. PLS-SEM analysis resulted in two model pathways rankings, which included pathways associated with the new concepts PUD, PID, and PBDA, demonstrating the different behaviors among each stakeholder category and within the healthcare system. The one-way ANOVA analysis produced heterogeneous scores among stakeholders' perspectives. This research shows how healthcare stakeholders' perspectives are valuable for optimizing stakeholder-specific health information management processes and healthcare IT solutions, while signaling future research paths. The new concepts PID, PBDA, and especially PUD bring new crucial perspectives for designing healthcare IT systems. The findings within this study also provide new grounds for conducting new research in other contexts due to the unique Azores healthcare system's administrative and geographical landscape.

**Keywords:** Health information management; Health information systems optimization; Healthcare stakeholders; Interoperability; Technology acceptance model

### Sustainable Development Goals (SDGs):



## RESUMO

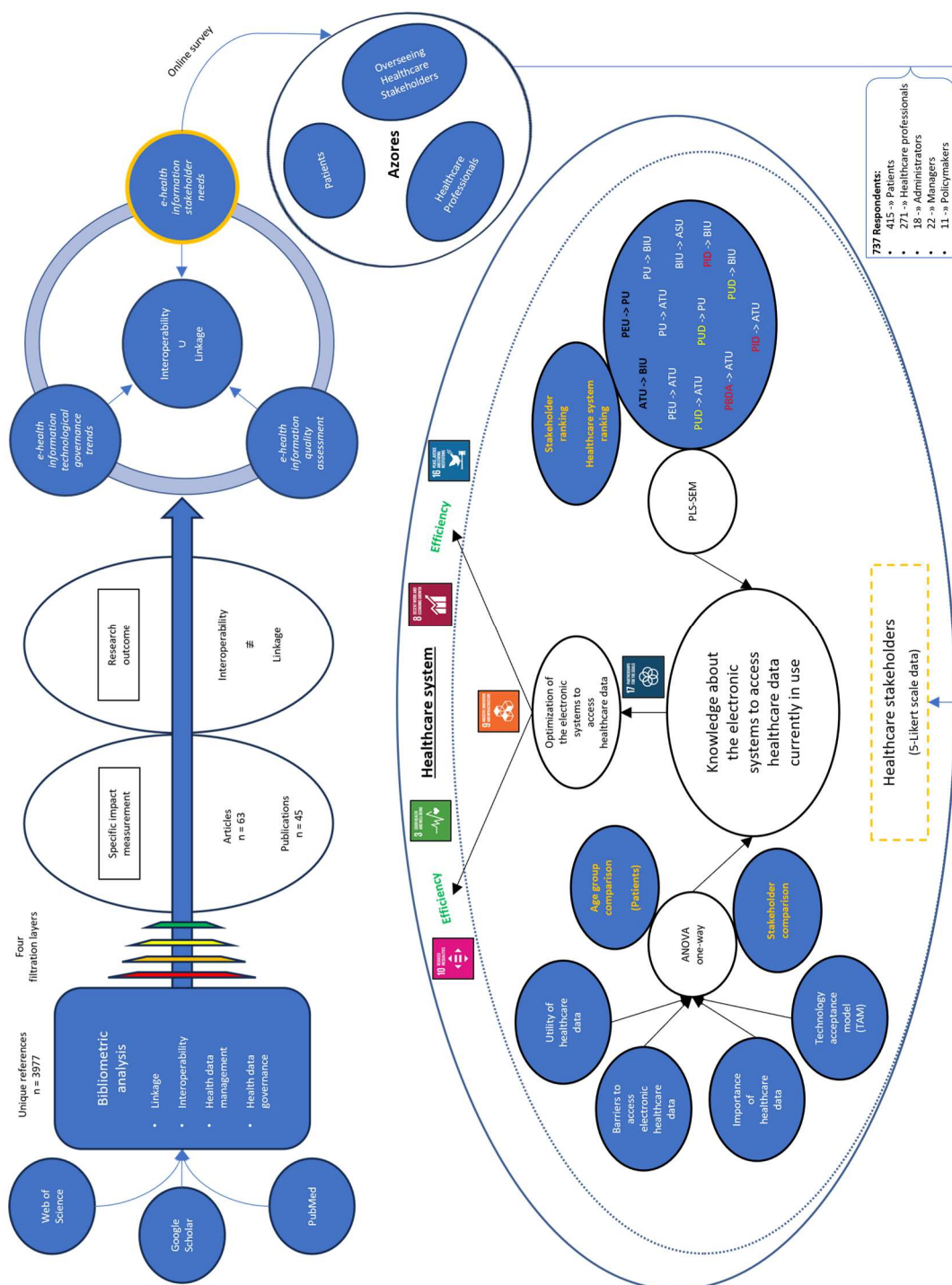
A complexidade dos cuidados de saúde está a crescer a um ritmo exponencial. Vastas quantidades de dados estão a ser geradas e acumuladas que impõem diversos desafios aos *stakeholders* da saúde associados à governança e gestão de informação de saúde (HIM). Esta investigação tem como objetivos avaliar o estado da arte da pesquisa sobre a interoperabilidade e ligação de dados no seio da HIM e analisar a influência das perspetivas do *stakeholders* da área da saúde na otimização da HIM. De forma a concretizar esta investigação, recorreu-se a uma análise bibliométrica e a um inquérito dirigido aos *stakeholders* da saúde residentes nos Açores, sobre sistemas eletrónicos de acesso a dados de saúde e baseado no modelo de aceitação tecnológica (estendido com a utilidade de dados, importância de dados e barreiras ao acesso a dados). As ferramentas PLS-SEM e ANOVA unidirecional providenciaram a análise estatística. Através desta investigação foi possível identificar três *clusters*: (1) *e-health information stakeholder needs*; (2) *e-health information quality assessment*; e (3) *e-health information technological governance trends*. Com a análise PLS-SEM obteve-se dois rankings de ligações do modelo que incluíram novas ligações associadas a novos conceitos PUD, PID e PBDA, demonstrando diversos comportamentos dos *stakeholders*. Os resultados da ANOVA unidirecional revelaram perspetivas heterogénicas. Esta investigação realça o importante papel das perspetivas dos *stakeholders* da área da saúde na otimização *stakeholder*-específica de processos de HIM e soluções de TI para o setor da saúde, enquanto fornece também pistas para futuras investigações no domínio da HIM. Os novos conceitos PID, PBDA e em especial o PUD trazem novas perspetivas para o desenho de sistemas TI na saúde. Também a particularidade geográfica e administrativa do sistema de saúde dos Açores permite replicar estes conceitos a diversos contextos de investigação.

**Palavras-chave:** Gestão de informação de saúde; Interoperabilidade; Modelo de aceitação tecnológica; Otimização de sistemas de informação de saúde; *Stakeholders* da área da saúde;

### Objetivos de Desenvolvimento Sustentável (ODS):



# GRAPHICAL ABSTRACT / RESUMO GRÁFICO



## DEDICATION / DEDICATÓRIA

To My Mother / À Minha Mãe



To My Girlfriend / À Minha Namorada



To Peanut & Star / Ao Amendoim e Estrela



To the Azores / Aos Açores



## ACKNOWLEDGEMENTS / AGRADECIMENTOS

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## CONTENTS

|                                                                                    |      |
|------------------------------------------------------------------------------------|------|
| ABSTRACT .....                                                                     | i    |
| RESUMO .....                                                                       | ii   |
| GRAPHICAL ABSTRACT / RESUMO GRÁFICO .....                                          | iii  |
| DEDICATION / DEDICATÓRIA .....                                                     | iv   |
| ACKNOWLEDGEMENTS / AGRADECIMENTOS .....                                            | v    |
| CONTENTS .....                                                                     | vi   |
| LIST OF TABLES .....                                                               | ix   |
| LIST OF FIGURES .....                                                              | xii  |
| LIST OF ABBREVIATIONS .....                                                        | xiii |
| CHAPTER I – INTRODUCTION .....                                                     | 1    |
| CHAPTER II – THEORETICAL BACKGROUND .....                                          | 5    |
| 2.1. Introduction .....                                                            | 5    |
| 2.2. Bibliometric methodology .....                                                | 7    |
| 2.2.1. Search strategy .....                                                       | 7    |
| 2.2.2. Data acquisition .....                                                      | 9    |
| 2.2.3. Data selection process and analysis .....                                   | 9    |
| 2.3. Results .....                                                                 | 11   |
| 2.3.1. Overview of the data acquisition and selection process .....                | 11   |
| 2.3.2. Sample overview .....                                                       | 13   |
| 2.3.3. Article citation analysis .....                                             | 16   |
| 2.3.4. Search platform analysis .....                                              | 19   |
| 2.3.5. Publication analysis .....                                                  | 20   |
| 2.3.6. Authors’ country of origin analysis .....                                   | 24   |
| 2.3.7. Authors’ keyword analysis .....                                             | 24   |
| 2.3.8. Analysis in VOSviewer software .....                                        | 25   |
| 2.3.9. Analysis of WORDSTAT software .....                                         | 30   |
| 2.4. Discussion of the bibliometric analysis results .....                         | 33   |
| 2.5 Adoption and acceptance models of technology and innovation in healthcare .... | 37   |
| 2.5.1 The technology acceptance model (TAM) .....                                  | 37   |
| 2.5.2. Diffusion of innovation (DOI) theory .....                                  | 38   |
| 2.5.3. Innovation resistance and barriers frameworks .....                         | 39   |
| 2.5.4. Toward an extended model for healthcare stakeholders .....                  | 40   |
| CHAPTER III – RESEARCH FRAMEWORK AND METHODOLOGY .....                             | 43   |
| 3.1. Research framework .....                                                      | 44   |
| 3.2. Research methodology .....                                                    | 45   |
| 3.2.1. Survey characteristics and framework .....                                  | 45   |
| 3.2.2. Data gathering .....                                                        | 49   |
| 3.2.3. Communication strategy .....                                                | 49   |
| 3.2.4. Data extraction and analysis .....                                          | 50   |
| CHAPTER IV – RESULTS .....                                                         | 51   |
| 4.1. Demographic data analysis .....                                               | 51   |
| 4.1.1. Overview of all healthcare stakeholders .....                               | 51   |
| 4.1.2. Overview of the different healthcare professionals .....                    | 53   |
| 4.1.3. Overview of patients by age group .....                                     | 54   |

|                                                                                                                                      |       |
|--------------------------------------------------------------------------------------------------------------------------------------|-------|
| 4.2. TAM-oriented perspectives about electronic systems in use to access healthcare data.....                                        | 56    |
| 4.2.1. All healthcare stakeholders' analysis .....                                                                                   | 56    |
| 4.2.2. Healthcare professionals analysis.....                                                                                        | 59    |
| 4.2.3. Patients by age group analysis.....                                                                                           | 61    |
| 4.3. Perspectives about barriers preventing electronic access to health data .....                                                   | 63    |
| 4.3.1. All healthcare stakeholders analysis.....                                                                                     | 63    |
| 4.3.2. Healthcare professionals analysis.....                                                                                        | 65    |
| 4.3.3. Patients by age group analysis.....                                                                                           | 66    |
| 4.4. Perspectives about the utility of selected healthcare data.....                                                                 | 67    |
| 4.4.1. All healthcare stakeholders analysis.....                                                                                     | 67    |
| 4.4.2. Healthcare professionals analysis.....                                                                                        | 70    |
| 4.4.3. Patients by age group analysis.....                                                                                           | 73    |
| 4.5. Perspectives about the importance of selected healthcare data .....                                                             | 75    |
| 4.5.1. All healthcare stakeholders analysis.....                                                                                     | 76    |
| 4.5.2. Healthcare professionals analysis.....                                                                                        | 79    |
| 4.5.3. Patients by age group analysis.....                                                                                           | 83    |
| 4.6. PLS-SEM's generated data analysis.....                                                                                          | 86    |
| 4.6.1. Healthcare professionals analysis.....                                                                                        | 86    |
| 4.6.2. Patients analysis.....                                                                                                        | 89    |
| 4.6.3. Overseeing healthcare stakeholders analysis.....                                                                              | 92    |
| 4.6.4. Healthcare stakeholders comparative analysis .....                                                                            | 95    |
| CHAPTER V – DISCUSSION .....                                                                                                         | 99    |
| 5.1. Theoretical implications .....                                                                                                  | 101   |
| 5.2. Managerial implications .....                                                                                                   | 103   |
| 5.3. Limitations and advantages .....                                                                                                | 104   |
| 5.4. Future directions .....                                                                                                         | 105   |
| CHAPTER VI – CONCLUSION .....                                                                                                        | 106   |
| REFERENCES .....                                                                                                                     | 108   |
| ANNEXES .....                                                                                                                        | xvi   |
| Annex I – Reproduction of the original online survey (in Portuguese).....                                                            | xvii  |
| Annex II – Translated reproduction of the online survey (in English).....                                                            | xxix  |
| Annex III – Deliberation n. ° 3/2024 of Ethics Committee of the University of the Azores .....                                       | xl    |
| Annex IV – Healthcare stakeholders' perspectives about TAM's constructs: standard deviation and number of answers .....              | xli   |
| Annex V – Healthcare stakeholders' perspectives about TAM's constructs: agreement and frequency analysis (%).....                    | xliii |
| Annex VI – Healthcare professionals' perspectives about TAM's constructs: standard deviation and number of answers .....             | xlvi  |
| Annex VII – Healthcare professionals' perspectives about TAM's constructs: agreement and frequency analysis (%).....                 | xlvii |
| Annex VIII – Patients' perspectives by age group about TAM's constructs: standard deviation and number of answers .....              | li    |
| Annex IX – Patients' perspectives by age group about TAM's constructs: agreement and frequency analysis (%).....                     | lii   |
| Annex X – Healthcare stakeholders' perspectives on barriers preventing electronic access to health data: agreement analysis (%)..... | lvi   |

|                                                                                                                                                                                           |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Annex XI – Healthcare professionals’ perspectives about barriers preventing electronic access to health data: standard deviation .....                                                    | lvii   |
| Annex XII – Healthcare professionals’ perspectives on barriers preventing electronic access to health data: agreement analysis (%).....                                                   | lviii  |
| Annex XIII – Patients’ perspectives by age group about barriers preventing electronic access to health data: standard deviation.....                                                      | lx     |
| Annex XIV – Patients’ perspectives by age group on barriers preventing electronic access to health data: agreement analysis (%).....                                                      | lxi    |
| Annex XV – Healthcare stakeholders’ perspectives about healthcare data utility: standard deviation.....                                                                                   | lxiii  |
| Annex XVI – Healthcare stakeholders’ perspectives about healthcare data: utility analysis (%) .....                                                                                       | lxv    |
| Annex XVII – Healthcare professionals' perspectives about healthcare data utility: standard deviation.....                                                                                | lxx    |
| Annex XVIII – Healthcare professionals' perspectives about healthcare data: utility analysis (%) .....                                                                                    | lxxii  |
| Annex XIX – Patients' perspectives by age group about healthcare data utility: standard deviation.....                                                                                    | lxxvii |
| Annex XX – Patients' perspectives by age group about healthcare data: utility analysis (%) .....                                                                                          | lxxix  |
| Annex XXI – Healthcare stakeholders' perspectives about healthcare data importance: standard deviation.....                                                                               | lxxxiv |
| Annex XXII – Healthcare stakeholders' perspectives about healthcare data: importance analysis (%) .....                                                                                   | lxxxvi |
| Annex XXIII – Healthcare professionals' perspectives about healthcare data importance: standard deviation.....                                                                            | xc     |
| Annex XXIV – Healthcare professionals' perspectives about healthcare data: importance analysis (%) .....                                                                                  | xciii  |
| Annex XXV – Patients' perspectives by age group about healthcare data importance: standard deviation.....                                                                                 | xcviii |
| Annex XXVI – Patients' perspectives by age group about healthcare data: importance analysis (%) .....                                                                                     | c      |
| Annex XXVII – PLS-SEM’s theoretical model about healthcare professionals’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago.....           | cv     |
| Annex XXVIII – Healthcare professionals' outer loadings values and average values for PID and PUD .....                                                                                   | cvi    |
| Annex XXIX – PLS-SEM’s theoretical model about patients’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago .....                           | cviii  |
| Annex XXX – Patients' outer loadings values and average values for PID and PUD .....                                                                                                      | cix    |
| Annex XXXI – PLS-SEM’s theoretical model about overseeing healthcare stakeholders’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago ..... | cx     |
| Annex XXXII – Overseeing healthcare stakeholders' outer loadings values and average values for PID and PUD.....                                                                           | cxii   |

## LIST OF TABLES

|                                                                                                                                                                       |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Table 1. Search query results obtained in Google Scholar, PubMed and Web of Science .....                                                                             | 7  |
| Table 2. Type of publication analysis.....                                                                                                                            | 11 |
| Table 3. Sample overview analysis. ....                                                                                                                               | 13 |
| Table 4. Reference characterization and its global impact ranking.....                                                                                                | 16 |
| Table 5. Publication characteristics and its global impact ranking .....                                                                                              | 21 |
| Table 6. Publication subject characterization and quantification within the publication<br>global impact ranking .....                                                | 23 |
| Table 7. Hypotheses' theoretical evidence and explanation: H1 to H6.....                                                                                              | 40 |
| Table 8. Hypotheses' theoretical evidence and explanation: H7 to H12.....                                                                                             | 42 |
| Table 9. Hypotheses definition.....                                                                                                                                   | 44 |
| Table 10. 5-Likert research categories: TAM's questions, barriers to access electronic<br>health data, and healthcare data utility and importance.....                | 47 |
| Table 11. Healthcare stakeholders' demographic characterization.....                                                                                                  | 52 |
| Table 12. Healthcare professionals' demographic characterization.....                                                                                                 | 54 |
| Table 13. Patients' demographic characterization .....                                                                                                                | 55 |
| Table 14. Healthcare stakeholders' perspectives about TAM's constructs: average and<br>one-way ANOVA results .....                                                    | 57 |
| Table 15. Healthcare professionals' perspectives about TAM's constructs: average and<br>one-way ANOVA results .....                                                   | 60 |
| Table 16. Patients' perspectives by age group about TAM's constructs: average and one-<br>way ANOVA results.....                                                      | 62 |
| Table 17. Healthcare stakeholders' perspectives about barriers preventing electronic<br>access to health data: average, standard deviation, and one-way ANOVA results | 64 |
| Table 18. Healthcare professionals' perspectives about barriers preventing electronic<br>access to health data: average and one-way ANOVA results .....               | 65 |
| Table 19. Patients' perspectives by age group about barriers preventing electronic access<br>to health data: average and one-way ANOVA results.....                   | 66 |
| Table 20. Healthcare stakeholders' perspectives about healthcare data utility: average<br>and one-way ANOVA results.....                                              | 68 |
| Table 21. Healthcare professionals' perspectives about healthcare data utility: average<br>and one-way ANOVA results.....                                             | 71 |
| Table 22. Patients' perspectives by age group about healthcare data utility: average and<br>one-way ANOVA results .....                                               | 74 |
| Table 23. Healthcare stakeholders' perspectives about healthcare data importance:<br>average and one-way ANOVA results .....                                          | 77 |
| Table 24. Healthcare professionals' perspectives about healthcare data importance:<br>average and one-way ANOVA results .....                                         | 81 |
| Table 25. Patients' perspectives by age group about healthcare data importance: average<br>and one-way ANOVA results.....                                             | 84 |
| Table 26. Healthcare professionals' PLS-SEM construct quality assessment.....                                                                                         | 87 |
| Table 27. Healthcare professionals' heterotrait-monotrait ratio (HTMT) matrix.....                                                                                    | 88 |
| Table 28. Healthcare professionals' PLS-SEM pathway quality assessment and<br>hypotheses testing.....                                                                 | 88 |
| Table 29. Patients' PLS-SEM construct quality assessment.....                                                                                                         | 89 |

|                                                                                                                                       |        |
|---------------------------------------------------------------------------------------------------------------------------------------|--------|
| Table 30. Patients' heterotrait-monotrait ratio (HTMT) matrix.....                                                                    | 90     |
| Table 31. Patients' PLS-SEM pathway quality assessment and hypotheses testing.....                                                    | 91     |
| Table 32. Overseeing healthcare stakeholders' PLS-SEM construct quality assessment.....                                               | 92     |
| Table 33. Overseeing healthcare stakeholders' heterotrait-monotrait ratio (HTMT) matrix.....                                          | 93     |
| Table 34. Overseeing healthcare stakeholders' PLS-SEM pathway quality assessment and hypotheses testing .....                         | 94     |
| Table 35. Ranking of the influence of constructs within electronic systems to access healthcare data .....                            | 96     |
| Table 36. Healthcare stakeholders' perspectives about TAM's constructs: standard deviation and number of answers .....                | xli    |
| Table 37. Healthcare stakeholders' perspectives about TAM's constructs: agreement and frequency analysis (%) .....                    | xliii  |
| Table 38. Healthcare professionals' perspectives about TAM's constructs: standard deviation and number of answers .....               | xlvi   |
| Table 39. Healthcare professionals' perspectives about TAM's constructs: agreement and frequency analysis (%) .....                   | xlvi   |
| Table 40. Patients' perspectives by age group about TAM's constructs: standard deviation and number of answers .....                  | li     |
| Table 41. Patients' perspectives by age group about TAM's constructs: agreement and frequency analysis (%) .....                      | lii    |
| Table 42. Healthcare stakeholders' perspectives on barriers preventing electronic access to health data: agreement analysis (%).....  | lvi    |
| Table 43. Healthcare professionals' perspectives about barriers preventing electronic access to health data: standard deviation.....  | lvii   |
| Table 44. Healthcare professionals' perspectives on barriers preventing electronic access to health data: agreement analysis (%)..... | lviii  |
| Table 45. Patients' perspectives by age group about barriers preventing electronic access to health data: standard deviation.....     | lx     |
| Table 46. Patients' perspectives by age group on barriers preventing electronic access to health data: agreement analysis (%).....    | lxi    |
| Table 47. Healthcare stakeholders' perspectives about healthcare data utility: standard deviation .....                               | lxiii  |
| Table 48. Healthcare stakeholders' perspectives about healthcare data: utility analysis (%).....                                      | lxv    |
| Table 49. Healthcare professionals' perspectives about healthcare data utility: standard deviation .....                              | lxx    |
| Table 50. Healthcare professionals' perspectives about healthcare data: utility analysis (%).....                                     | lxxii  |
| Table 51. Patients' perspectives by age group about healthcare data utility: standard deviation .....                                 | lxxvii |
| Table 52. Patients' perspectives by age group about healthcare data: utility analysis (%) .....                                       | lxxix  |
| Table 53. Healthcare stakeholders' perspectives about healthcare data importance: standard deviation.....                             | lxxxiv |
| Table 54. Healthcare stakeholders' perspectives about healthcare data: importance analysis (%) .....                                  | lxxxvi |
| Table 55. Healthcare professionals' perspectives about healthcare data importance: standard deviation.....                            | xc     |

|                                                                                                              |        |
|--------------------------------------------------------------------------------------------------------------|--------|
| Table 56. Healthcare professionals' perspectives about healthcare data: importance analysis (%) .....        | xciii  |
| Table 57. Patients' perspectives by age group about healthcare data importance: standard deviation.....      | xcviii |
| Table 58. Patients' perspectives by age group about healthcare data: importance analysis (%) .....           | c      |
| Table 59. Healthcare professionals' outer loadings values and average values for PID and PUD .....           | cvi    |
| Table 60. Patients' outer loadings values and average values for PID and PUD .....                           | cix    |
| Table 61. Overseeing healthcare stakeholders' outer loadings values and average values for PID and PUD ..... | cxii   |

## LIST OF FIGURES

|                                                                                                                                                                                         |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Figure 1. Research structure .....                                                                                                                                                      | 3     |
| Figure 2. First page of the article titled “System interoperability and data linkage in the era of health information management: A bibliometric analysis” by Costa et al. (2024) ..... | 4     |
| Figure 3. Number of articles per year analysis by artificial intelligence software Dimensions.ai .....                                                                                  | 9     |
| Figure 4. Data selection process and analysis .....                                                                                                                                     | 10    |
| Figure 5. Chronological evolution of publications by level of data selection .....                                                                                                      | 12    |
| Figure 6. Sample timeline overview .....                                                                                                                                                | 15    |
| Figure 7. Sample overview by a word cloud software generator .....                                                                                                                      | 16    |
| Figure 8. Number of results obtained in Google Scholar, PubMed and Web of Science .....                                                                                                 | 19    |
| Figure 9. Geographical distribution of articles according to their authors’ origin .....                                                                                                | 24    |
| Figure 10. Sample overview by a word cloud software generator .....                                                                                                                     | 25    |
| Figure 11. Title analysis performed by VOSviewer network visualization .....                                                                                                            | 26    |
| Figure 12. Title analysis performed by VOSviewer overlay visualization .....                                                                                                            | 27    |
| Figure 13. Title analysis performed by VOSviewer density analysis .....                                                                                                                 | 27    |
| Figure 14. Abstract analysis performed by VOSviewer network visualization .....                                                                                                         | 28    |
| Figure 15. Abstract analysis performed by VOSviewer overlay visualization .....                                                                                                         | 29    |
| Figure 16. Abstract analysis performed by VOSviewer density analysis .....                                                                                                              | 30    |
| Figure 17. Phrase extraction analysis performed by WORDSTAT .....                                                                                                                       | 31    |
| Figure 18. Proximity of keywords analysis by WORDSTAT: interoperability vs. linkage .....                                                                                               | 32    |
| Figure 19. WORDSTAT phrase analysis of authors’ keywords .....                                                                                                                          | 33    |
| Figure 20. Theoretical framework to achieve high quality interoperability and data linkage processes .....                                                                              | 36    |
| Figure 21. Survey characteristics and framework .....                                                                                                                                   | 46    |
| Figure 22. Examples of online and offline communication strategies .....                                                                                                                | 50    |
| Figure 23. Comparison of standard deviation values in path coefficients of healthcare stakeholders’ constructs relationships .....                                                      | 95    |
| Figure 24. Overall relevance of constructs’ relationships in the establishment of electronic systems to access healthcare data within the Azorean healthcare system .....               | 97    |
| Figure 25. Theoretical framework to achieve optimization of electronic systems to access healthcare through healthcare stakeholders’ perspectives. ....                                 | 102   |
| Figure 26. Deliberation n. ° 3/2024 of Ethics Committee of the University of the Azores .....                                                                                           | xl    |
| Figure 27. PLS-SEM’s theoretical model about healthcare professionals’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago ..cv            |       |
| Figure 28. PLS-SEM’s theoretical model about patients’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago .....                           | cviii |
| Figure 29. PLS-SEM’s theoretical model about overseeing healthcare stakeholders’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago ..... | cxi   |

## LIST OF ABBREVIATIONS

|          |                                                    |
|----------|----------------------------------------------------|
| Admi     | Administrators                                     |
| ANOVA    | Analysis of variance                               |
| ASU      | Actual System in Use                               |
| ATU      | Attitude Toward Using                              |
| AVE      | Average variance extracted                         |
| BIU      | Behavioral Intention to Use                        |
| DOI      | Diffusion of innovation                            |
| FHIR     | Fast Healthcare Interoperability Resources         |
| HIM      | Health information management                      |
| HL7      | Health Level 7                                     |
| Hpro     | Healthcare professionals                           |
| HTMT     | Heterotrait-monotrait                              |
| Mana     | Managers                                           |
| Nurs     | Nurses                                             |
| Nutr     | Nutritionists                                      |
| Pati     | Patients                                           |
| PBDA     | Perceived Barriers to Healthcare Data Access       |
| PEU      | Perceived Ease of Use                              |
| Phar     | Pharmacists                                        |
| Phys     | Physicians                                         |
| PID      | Perceived Importance of Healthcare Data            |
| PLS-SEM  | Partial least squares structural equation modeling |
| Pmkr     | Policymakers                                       |
| Psyc     | Psychologists                                      |
| PU       | Perceived Usefulness                               |
| PUD      | Perceived Usefulness of Healthcare Data            |
| $R^2$    | R-squared                                          |
| $\rho_A$ | Average Inter-item correlation                     |
| Sdt      | Senior diagnostic and therapeutic technicians      |
| Sht      | Senior health technicians                          |
| TAM      | Technology acceptance model                        |
| UTAUT    | Unified theory of acceptance and use of technology |
| VIF      | Variance inflation factor                          |

## CHAPTER I – INTRODUCTION

The rapid increase in health data generation is creating a new set of challenges when managing, governing, and strategically using that information. Healthcare players, whether they're professionals, patients, managers, or policymakers, are faced with an overwhelming amount of raw data. These data need to be organized, interpreted, and turned into actionable insights to drive evidence-based care and inform policy decisions (Arul et al., 2021; Genevieve et al., 2019). A crucial area that plays a role in this transformation is health information management (HIM). According to the American Health Information Management Association (AHIMA), HIM is all about acquiring, analyzing, and safeguarding health data (both digital and traditional) to ensure quality care, blending elements of business, science, and IT (AHIMA, 2023).

Tied closely to HIM is health data governance, which sets the standards for access, privacy, accuracy, and ethical use of data (Rosenbaum, 2010). As digital health systems become more common, their ability to integrate and process data from various sources is key to enhancing efficiency and creating value in healthcare delivery.

One of the main concerns in this landscape is achieving data linkage, which means bringing together data records from different sources to create comprehensive, interoperable profiles of individuals or events (Bohensky et al., 2010; Winglee et al., 2005). The OECD defines data linkage as a way for stakeholders to combine information that's scattered across systems and often inaccessible on its own (Harron, 2016). This process supports research and operational objectives, such as epidemiological surveillance and improving clinical performance (Christen, 2019; Green et al., 2015; Holman et al., 2008). However, successful linkage relies on the ability to achieve interoperability, which is the capacity of different systems to reliably exchange and utilize information (Lehne et al., 2019).

Despite the potential of health informatics systems, a significant gap persists in their integration across healthcare environments, particularly in geographically dispersed and resource-constrained regions. Although interoperability is a top priority in health IT (Torab-Miandoab et al., 2023), many systems still operate in silos due to outdated technologies, the absence of shared data standards, and minimal harmonization across platforms (Reisman, 2017). Architectural design, governance structures, and

interoperability standards such as HL7 and FHIR are critical to unlocking interconnected health ecosystems' benefits (Azarm et al., 2017; Gowda et al., 2022). Understanding core variables within different social, political, and clinical challenges and contexts can be crucial for establishing an interoperable system. Healthcare stakeholders must promote research in this field while promoting the awareness of the need for a universal interoperability strategy between all healthcare stakeholder (Tiago et al., 2016).

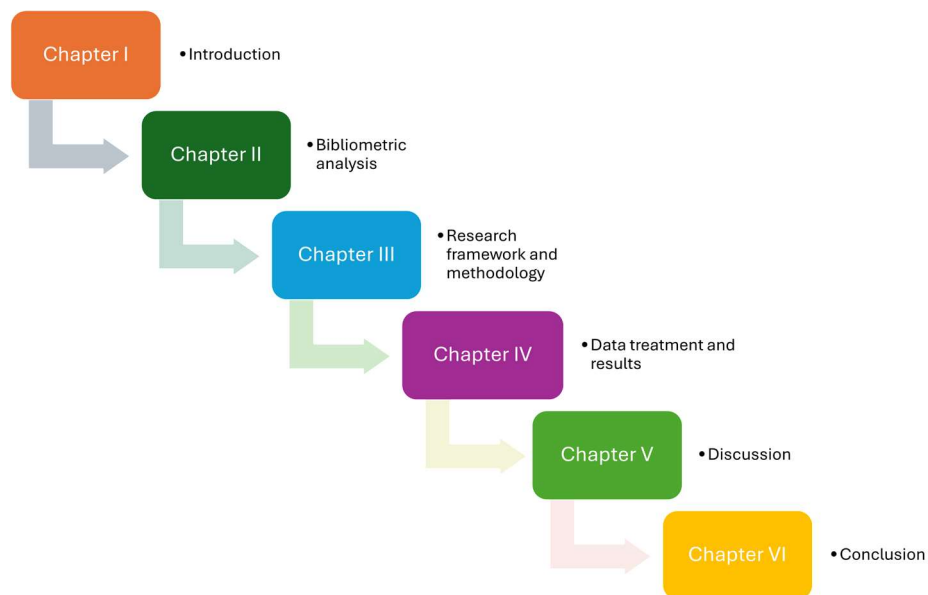
While these technical challenges are well studied, less is known about how healthcare stakeholders perceive and engage with these digital tools, especially in underserved or remote areas. This represents a significant research gap: much of the existing literature focuses on system performance or implementation outcomes but rarely considers the heterogeneous needs, attitudes, and barriers faced by different user groups at the local level. Additionally, even though frameworks like the technology acceptance model (TAM) have been widely used to assess technology use in healthcare (Chau & Hu, 2001; Davis, 1989; Davis et al., 1989; Holden & Karsh, 2010), studies that include managers, administrators, and policymakers (especially in decentralized health systems) are quite rare (Rahimi et al., 2018). Adding to this gap, most TAM-based studies often overlook important factors like data utility, data importance, and perceived access barriers, even though these elements play a crucial role in how systems are adopted. To truly understand how these additional factors influence user behavior, we need to optimize health information systems and encourage broader adoption among all stakeholders.

This research aims to dive into the perspectives of stakeholders in the Azores regarding the use of electronic health systems. It combines traditional TAM constructs with new dimensions, such as perceived data access barriers and datasets utility and importance. By doing this, we can gain a more thorough understanding of what encourages or hinders system usage among professionals, patients, and regulatory bodies. This study also seeks to fill the gap in empirical data concerning peripheral healthcare regions and aims to enhance existing theoretical models by factoring in context-sensitive variables and the diversity of stakeholders involved. This study is particularly timely given the policy drive toward digital health transformation in remote and island territories. By identifying key barriers, enablers, and perceptions, it informs both technological design and strategic planning. It also lays the groundwork for a stakeholder-informed roadmap to enhance interoperability and data linkage in complex healthcare environments.

While health data technologies continue to evolve, their true potential depends on aligning with the lived realities and expectations of the users they are meant to serve. Advancing interoperability and data linkage in health systems requires a multi-dimensional approach that balances technological innovation, stakeholder-centered design, and strategic governance. Bridging the gap between technical capability and stakeholder engagement is crucial for building smarter, more inclusive health information systems.

To achieve this research's purposes and objectives, a six-chapter structure was developed, as demonstrated in Figure 1.

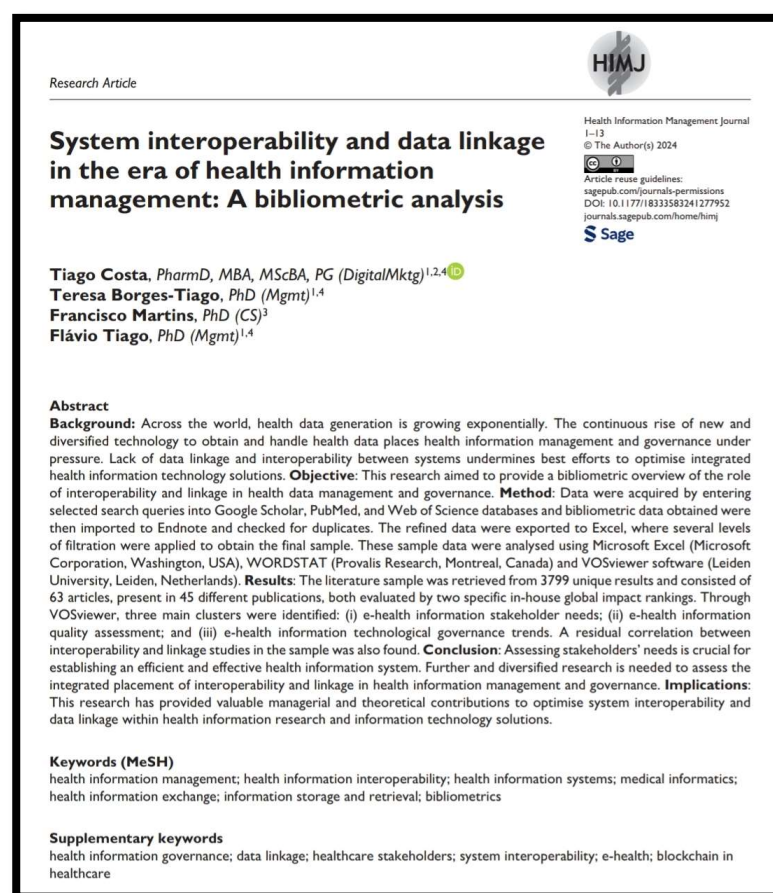
Figure 1. Research structure



The present chapter provides a short introduction to the research purpose and the questions raised by the literature that led to the formulation of the objectives of this research. Moreover, it also provides a view of the research structure.

The second chapter produces a bibliometric analysis, already published by Costa et al. (2024) (see Figure 2), that provides an overview of the current and future role of data linkage and interoperability within information health management and governance.

Figure 2. First page of the article titled “System interoperability and data linkage in the era of health information management: A bibliometric analysis” by Costa et al. (2024)



The third chapter includes the theoretical hypothesis raised by the literature following the bibliometric analysis results, leading to the creation of the research framework. It also provides all the required methodological steps taken to achieve the objectives of this research.

The methodology implementation through an online survey targeting residents in the Autonomous Region of the Azores led to the acquisition of data, which were treated and analysed using a diverse set of tools, leading to the creation of the fourth chapter.

In the fifth chapter, the discussion of results is performed, including the acknowledgement of limitations that have emerged. Also, theoretical and managerial contributions in this chapter provide insights for future research and optimizations within healthcare systems IT solutions.

In the final chapter, the conclusions of this research are summarized.

## CHAPTER II – THEORETICAL BACKGROUND

### 2.1. Introduction

The rapid digital transformation of the healthcare sector has led to the continuous generation of vast amounts of health-related data. This data explosion brings unprecedented opportunities and complex challenges, particularly in data governance, integration, and stakeholder engagement. As health systems strive to become more data-driven, the effective management and use of these data assets have become central to improving healthcare delivery, planning, and policy formulation.

At the heart of this digital shift are two key concepts: health information management (HIM) and health data governance. HIM is defined by the American Health Information Management Association (AHIMA, 2023) as the practice of acquiring, analyzing, and protecting medical information, both digital and traditional, to support quality patient care. It integrates business, science, and IT to ensure health data's secure and effective use. Health data governance complements this by establishing the principles, policies, and structures necessary for responsible access, sharing, and stewardship of data (Rosenbaum, 2010).

A significant challenge within this digital landscape is achieving data linkage, merging records from diverse sources to build comprehensive patient profiles or datasets (Bohensky et al., 2010; Harron, 2016; Winglee et al., 2005). Data linkage enhances the analytical power of health information systems by enabling integrated insights across clinical, administrative, and epidemiological domains (Christen, 2019; Green et al., 2015). However, its success is contingent upon the interoperability of different information systems to exchange and use data effectively (Lehne et al., 2019; Reisman, 2017). Without interoperability, even the most sophisticated digital tools risk functioning in isolation, limiting their potential impact on health outcomes and operational efficiency. Despite growing awareness of the importance of interoperability, significant gaps remain in its implementation, especially in peripheral and resource-limited settings. Previous research has predominantly focused on technological solutions, often overlooking the critical role of end-user perceptions, barriers, and contextual factors in shaping system effectiveness.

To address this gap, the present research is grounded in the TAM (Davis, 1989; Davis et al., 1989), which remains one of the most influential frameworks for studying the adoption of information technologies. TAM posits that user acceptance is primarily driven by perceived usefulness (PU) and perceived ease of use (PEU), which in turn influence users' attitudes and intentions toward system use. While TAM has been widely applied to assess health IT adoption among healthcare professionals and patients (Chau & Hu, 2001; Holden & Karsh, 2010; Palos-Sanchez et al., 2021), few studies have extended this framework to include administrators, managers, and policymakers—despite their pivotal roles in system implementation and governance (Rahimi et al., 2018).

To ensure the study is well-grounded in today's academic conversations, we conducted a bibliometric analysis to track how research has evolved within the health information management, data linkage, and system interoperability domains. This analysis helped us pinpoint key research themes, spot emerging trends, and identify gaps in the literature, especially by understanding how stakeholders engage with digital health systems. By charting the scientific landscape using quantitative measures like publication frequency, citation patterns, and keyword co-occurrence, a bibliometric study gives solid evidence for the importance of our chosen theoretical concepts. It lays a data-driven foundation for building our research model. In the next section, we will share the results of this analysis and show how it influenced the design and scope of our current investigation.

Bibliometric analysis is growing in the research domain (Donthu et al., 2021). It is based on techniques that allow measuring the scholar's communication performance. Some of these techniques, such as citation analysis, allow both quantitative and qualitative evaluations (Borgman & Furner, 2005). One of the major contributions to the evolution of these bibliometric analyses occurred when software (e.g., VOSviewer) and robust databases (e.g., Scopus and Web of Science) appeared in the academic market (Donthu et al., 2021). In the healthcare sector, this type of analysis can be found mainly in the field of medicine, such as medical data mining and big data research (Hu et al., 2020; Kokol et al., 2021; Liao et al., 2018). Regarding bibliometric analysis of system interoperability in the healthcare sector, studies associated with electronic health records and blockchain technology have emerged (Anand & Sadhna, 2023). As for data linkage studies adopting bibliometric analysis, they seem to be nonspecific or non-existent. In this way, in the current chapter, an evaluation of the state of the art about research on

interoperability and data linkage within health information management is conducted. Furthermore, parts of this chapter were already published by Costa et al. (2024).

## 2.2. Bibliometric methodology

### 2.2.1. Search strategy

This bibliometric analysis was based on the search of research papers on three platforms, namely Google Scholar, PubMed and Web of Science, as they were considered broad databases regarding the theme analysis. As displayed in Table 1, the search in each platform was performed using the words "health data management," "health information governance", "health information management", "healthcare data governance", "healthcare data management", "healthcare information governance", "healthcare information management", associated with the terms “linkage” and “interoperability”. No year limitations were used as the objective was to maximize the analysis of the evolution of publishing research papers over time.

Table 1. Search query results obtained in Google Scholar, PubMed and Web of Science

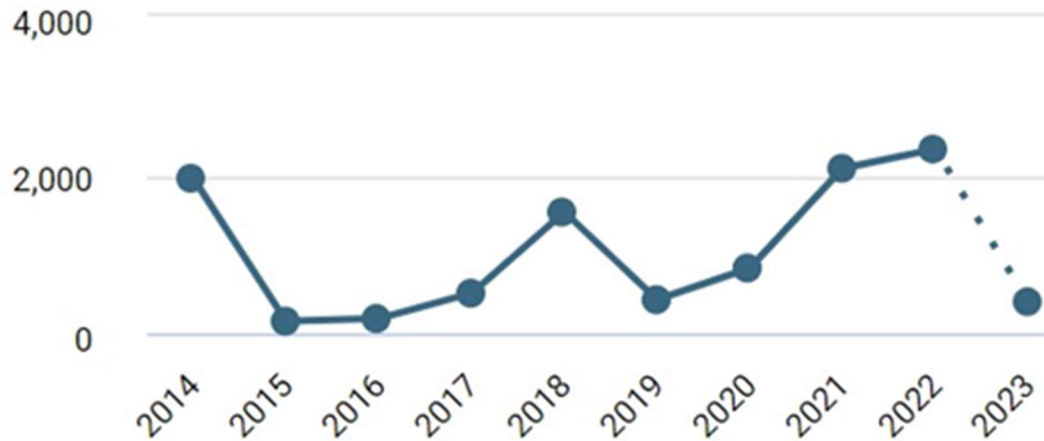
| Google Scholar                                                 |                      |                                          | PubMed                                                                 |                      |                                          | Web of Science                                                                      |                      |                                          |
|----------------------------------------------------------------|----------------------|------------------------------------------|------------------------------------------------------------------------|----------------------|------------------------------------------|-------------------------------------------------------------------------------------|----------------------|------------------------------------------|
| Search query                                                   | Search query results | Search query results exportation results | Search query                                                           | Search query results | Search query results exportation results | Search query                                                                        | Search query results | Search query results exportation results |
| linkage OR interoperability<br>"health data governance"        | 294                  | 280                                      | ("health data governance")<br>AND (linkage OR interoperability)        | 0                    | 0                                        | (ALL=("health data governance"))<br>AND<br>ALL=(linkage OR interoperability)        | 0                    | 0                                        |
| linkage OR interoperability<br>"health data management"        | 1,340                | 972                                      | ("health data management")<br>AND (linkage OR interoperability)        | 93                   | 93                                       | (ALL=("health data management"))<br>AND<br>ALL=(linkage OR interoperability)        | 8                    | 8                                        |
| linkage OR interoperability<br>"health information governance" | 141                  | 139                                      | ("health information governance")<br>AND (linkage OR interoperability) | 0                    | 0                                        | (ALL=("health information governance"))<br>AND<br>ALL=(linkage OR interoperability) | 0                    | 0                                        |
| linkage OR interoperability<br>"health information management" | 7,670                | 1,000                                    | ("health information management")<br>AND (linkage                      | 134                  | 134                                      | (ALL=("health information management"))<br>AND                                      | 51                   | 51                                       |

| Google Scholar                                                  |                      |                                          | PubMed                                                                  |                      |                                          | Web of Science                                                                    |                      |                                          |
|-----------------------------------------------------------------|----------------------|------------------------------------------|-------------------------------------------------------------------------|----------------------|------------------------------------------|-----------------------------------------------------------------------------------|----------------------|------------------------------------------|
| Search query                                                    | Search query results | Search query results exportation results | Search query                                                            | Search query results | Search query results exportation results | Search query                                                                      | Search query results | Search query results exportation results |
|                                                                 |                      |                                          | OR interoperability)                                                    |                      |                                          | ALL=(linkage OR interoperability)                                                 |                      |                                          |
| linkage OR interoperability "healthcare data governance"        | 22                   | 22                                       | ("healthcare data governance") AND (linkage OR interoperability)        | 0                    | 0                                        | (ALL=("healthcare data governance")) AND ALL=(linkage OR interoperability)        | 0                    | 0                                        |
| linkage OR interoperability "healthcare data management"        | 561                  | 540                                      | ("healthcare data management") AND (linkage OR interoperability)        | 4                    | 4                                        | (ALL=("healthcare data management")) AND ALL=(linkage OR interoperability)        | 7                    | 7                                        |
| linkage OR interoperability "healthcare information governance" | 9                    | 9                                        | ("healthcare information governance") AND (linkage OR interoperability) | 0                    | 0                                        | (ALL=("healthcare information governance")) AND ALL=(linkage OR interoperability) | 0                    | 0                                        |
| linkage OR interoperability "healthcare information management" | 1,970                | 1,000                                    | ("healthcare information management") AND (linkage OR interoperability) | 3                    | 3                                        | (ALL=("healthcare information management")) AND ALL=(linkage OR interoperability) | 4                    | 4                                        |
| Total                                                           | 12,007               | 3,962                                    |                                                                         | 234                  | 234                                      |                                                                                   | 70                   | 70                                       |
| EndNote importation results                                     |                      | 3,818                                    |                                                                         |                      | 234                                      |                                                                                   |                      | 70                                       |

Source: Costa et al. (2024), supplemental material

To confirm that the data covered the most established articles and did not suffer from database bias, secondary data gathering was conducted using the artificial intelligence software Dimensions (see Figure 3). The AI tool retrieved 22,958 references, from which 13,083 were articles and book chapters, with the following growth rate. Narrowing the search to articles, 2,481 were found, converging with the previous query, attesting to the quality and validity of the initial database.

Figure 3. Number of articles per year analysis by artificial intelligence software Dimensions.ai



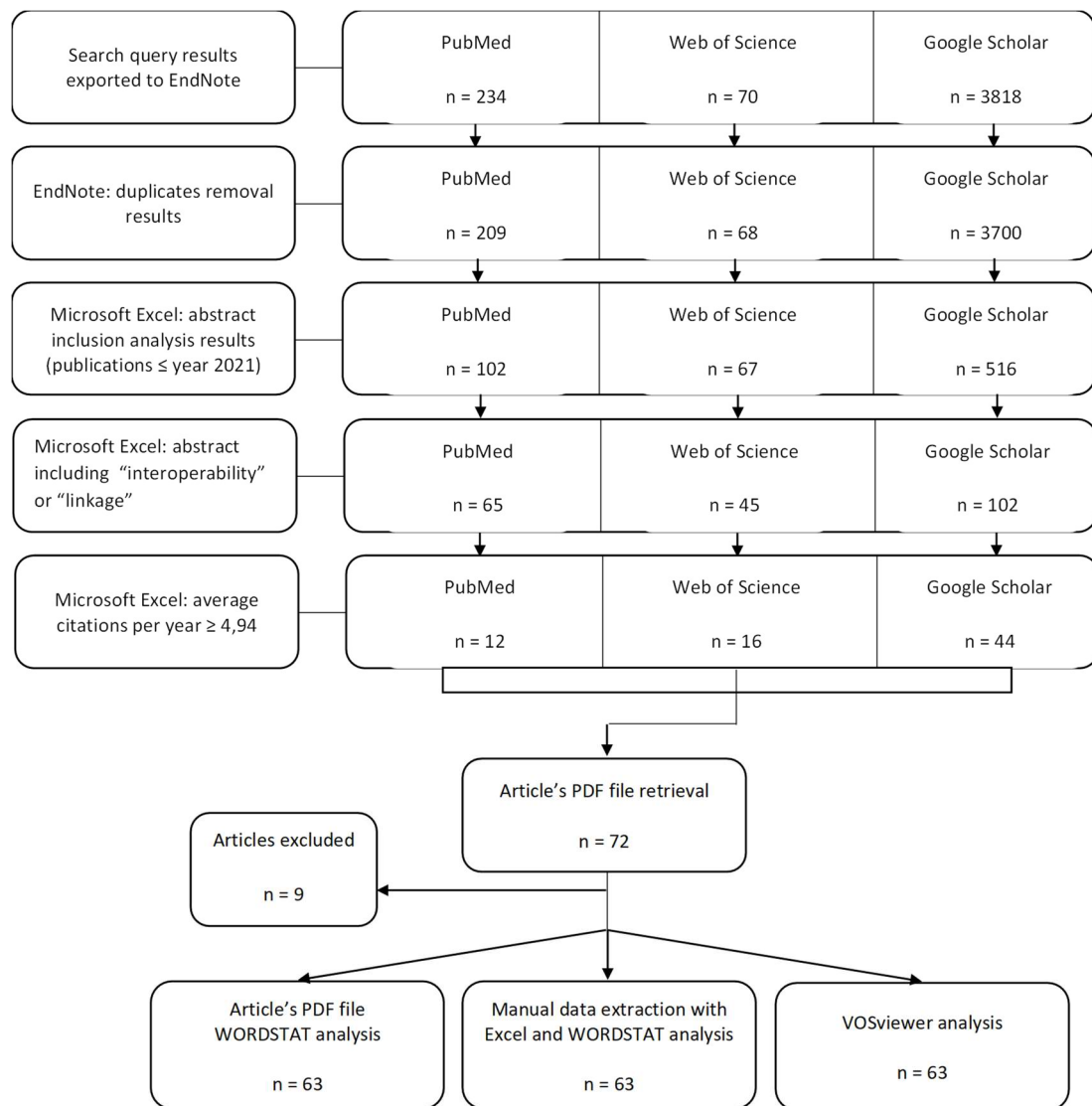
### 2.2.2. Data acquisition

Data was collected from the three search platforms between December 2021 and February 2022. The search results from Google Scholar were first added to the “My Library” feature and then retrieved to an EndNote file using the export function. In the Web of Science search platform (Web of Science Core Collection), data were retrieved directly into an EndNote file. Regarding PubMed, data was obtained using its citation manager, which created a compatible EndNote file. All data were extracted in February 2022. For the citations analysis, the number of citations per paper was retrieved manually and on the same day from Google Scholar.

### 2.2.3. Data selection process and analysis

All reference files obtained through the search platforms were imported to EndNote, followed by a reference update using EndNote’s “Find Reference Updates” feature. With up-to-date references, another automatic EndNote function, namely “Find Duplicates,” was used to eliminate duplicated references. The refined data obtained in EndNote was transferred to Microsoft Excel for further analyses (see Figure 4).

Figure 4. Data selection process and analysis



Source: Costa et al. (2024), p. 3

In this software, an article's abstract analysis was performed. The first stage was to verify which results were abstract and eliminate the ones without it (only articles published until the end of 2021 were considered at this stage, as 2022 was an incomplete year and could provide subsequent erroneous citation calculations and results). In the second stage, the selected abstracts were analyzed for the inclusion of the words "interoperability" or "linkage". Afterward, the results containing abstracts with the previous words were analyzed according to their average yearly citations. The baseline

value of the previous metric was calculated by the average number of citations and article years of the 212 selected articles, to narrow and obtain even more meaningful and impactful results. This way, research papers with an average of citations per year  $< 4.94$  were excluded as this value represents the minimum specific threshold within the scope of analysis for articles to be considered impactful (Emmer et al., 2022). Finally, the selected 72 references were screened to verify if they were by thematic analysis (through screening of articles' PDF files). After the previous selection procedure, data was evaluated using mainly Microsoft Excel, VOSviewer v. 1.6.18, and WORDSTAT v. 9.0.11 software as schematized in Figure 4. VOSviewer tools were deployed to verify the possible relationships of words and their strength within abstracts and titles of articles and assess their chronological appearance.

## 2.3. Results

### 2.3.1. Overview of the data acquisition and selection process

As Figure 4 and Table 2 demonstrated, search results were refined through several processes, leading to the final sample.

Table 2. Type of publication analysis

| Type of publication    | Global results<br>(without duplicates) |        | With<br>Abstract |        | Abstract with<br>"interoperability" and/or<br>"linkage" |        | Article number of citations per<br>year index $\geq 4,94$ (without<br>exclusions) |        |
|------------------------|----------------------------------------|--------|------------------|--------|---------------------------------------------------------|--------|-----------------------------------------------------------------------------------|--------|
| Book                   | 84                                     | 2.11%  | -                | -      | -                                                       | -      | -                                                                                 | -      |
| Book Section           | 284                                    | 7.14%  | -                | -      | -                                                       | -      | -                                                                                 | -      |
| Conference Proceedings | 488                                    | 12.27% | 11               | 1.61%  | 9                                                       | 4.25%  | 1                                                                                 | 1.39%  |
| Generic                | 52                                     | 1.31%  | -                | -      | -                                                       | -      | -                                                                                 | -      |
| Journal Article        | 2,884                                  | 72.52% | 674              | 98.39% | 203                                                     | 95.75% | 71                                                                                | 98.61% |
| Report                 | 16                                     | 0.40%  | -                | -      | -                                                       | -      | -                                                                                 | -      |
| Thesis                 | 169                                    | 4.25%  | -                | -      | -                                                       | -      | -                                                                                 | -      |
| Total                  | 3,977                                  | 100%   | 685              | 100%   | 212                                                     | 100%   | 72                                                                                | 100%   |

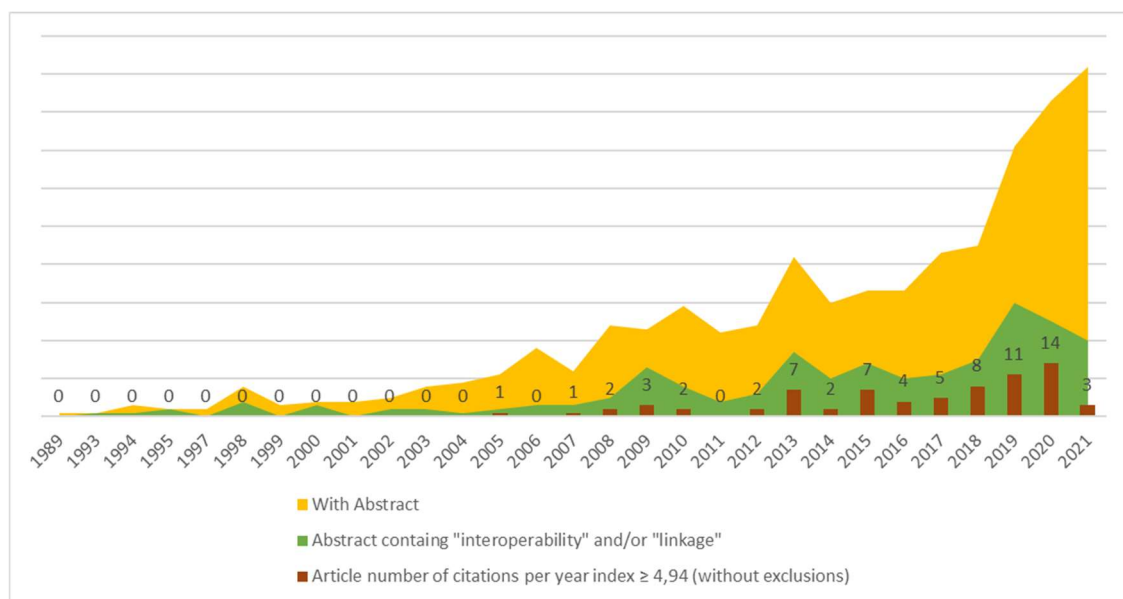
Note: Data extracted from EndNote and analysed in Microsoft Excel

Source: Adapted from Costa et al. (2024), supplemental material

One of the first meaningful levels of data treatment was the abstract inclusion criterion, which revealed that from the 3,977 unique references obtained in EndNote, only 685 (17.22%) had an abstract included in the exported results. When analyzing the abstract for the inclusion of “interoperability” and/or “linkage” words, the numbers dropped to 212 references (30.95%; 5.33% from the 3,977 unique references). In the last criterion applied, only 72 references (33.96%; 1.81% from the 3,977 unique references) were within the article number of citations per year index  $\geq 4.94$ . When analyzing the type of publication and according to Table 2, most of the publications were journal articles. This tendency of article dominance spread to the following restriction selection levels, increasing the prevalence of journal articles even more.

Regarding the publication chronological evolution and according to Figure 5, until 2005, few publications about this research subject were published.

Figure 5. Chronological evolution of publications by level of data selection



Source: Costa et al. (2024), p. 4

From this year, the number of publications continued to rise, reaching its top between 2018 and 2021. The number of refined publications (with abstract and abstract with selected words) also appears to have the same behavior until 2019. However, from 2020,

both these publications started to diverge as the number of publications with abstracts with selected words continuously dropped until the end of 2021.

### 2.3.2. Sample overview

As previously reported, 72 articles were selected for the preliminary sample. The detailed analysis of these research papers led to the exclusion of 9 articles as they did not fit into the scope of the present study. The 63 articles that were selected are summarized in Table 3. Of these 63 research articles, 51 (80.95%) contained the word “interoperability” in their abstract, followed by the word “linkage” with 11 (17.46%) results, and only 1 (1.59%) paper had an abstract containing simultaneously the words “interoperability” and “linkage”.

Table 3. Sample overview analysis

| Reference                     | Abstract with "interoperability" and/or "linkage"? | In-house overview                                                                                                                                                                                              |
|-------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Abdekhoda et al., 2016)      | interoperability                                   | Physicians' views and experiences about the use of electronic medical records                                                                                                                                  |
| (Ahmadi & Aslani, 2018)       | interoperability                                   | A systematic review about the usefulness of cloud computing in implementing electronic health records                                                                                                          |
| (Ahmed et al., 2020)          | interoperability                                   | Literature review that discusses the role of artificial intelligence and machine learning in the field of medicine, including electronic health records                                                        |
| (Alkrajji et al., 2013)       | interoperability                                   | Healthcare decision-makers' perspectives on the barriers to the adoption of health data standards                                                                                                              |
| (Alonso et al., 2019)         | interoperability                                   | Literature review that discusses blockchain use in eHealth, namely, electronic health and medical reports                                                                                                      |
| (Ammar et al., 2020)          | interoperability                                   | The role of personal health libraries as patients' private database to assist in their decision-making process regarding their health issues                                                                   |
| (Ammar et al., 2021)          | interoperability                                   | Development of personal health libraries and mobile applications according to the requirements of users                                                                                                        |
| (Arul et al., 2021)           | interoperability                                   | The role of blockchain applied to the Internet of Medical Things with a proposal for the Internet of Medical Things is discussed, along with a proposal for a multi-modal secure data dissemination framework. |
| (Avila et al., 2017)          | interoperability                                   | Applicability of service-oriented architecture to health systems as a tool for systems integration efficiency                                                                                                  |
| (Bahga & Madiseti, 2013)      | interoperability                                   | Design of a cloud-based interoperable electronic health record system (CHISTAR)                                                                                                                                |
| (Bates, 2005)                 | interoperability                                   | Barriers and policies influencing the adoption of electronic health records by U.S. physicians                                                                                                                 |
| (Blasimme et al., 2018)       | Interoperability                                   | Review of policy documents about data-sharing guidance                                                                                                                                                         |
| (Blazona & Koncar, 2007)      | Interoperability                                   | Application of the health level 7 (HL7) standard to a radiology information system for data integration into hospital information networks.                                                                    |
| (Boyd et al., 2015)           | Linkage                                            | Linkage of different health data records into a national data linkage infrastructure in Australia                                                                                                              |
| (de Moura Costa et al., 2020) | Interoperability                                   | Systematic literature review of fog computing application to healthcare                                                                                                                                        |
| (de Quiros et al., 2018)      | Interoperability                                   | Development of a hospital's interoperable health information system through a terminology server and its standard terminologies                                                                                |
| (Detmer et al., 2008)         | Interoperability                                   | Determinants of implementing an integrated personal health record framework                                                                                                                                    |
| (Dinh-Le et al., 2019)        | Interoperability                                   | Overview and review of the integration process between electronic health records and wearable health technology                                                                                                |

| Reference                        | Abstract with "interoperability" and/or "linkage"? | In-house overview                                                                                                                                                                                           |
|----------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Downs et al., 2019)             | Linkage                                            | Data linkage project between clinical mental health service data and education and social care services data                                                                                                |
| (Dubovitskaya et al., 2020)      | Interoperability                                   | Development of blockchain-based electronic health records data sharing and management, which involves actively the patient and caregivers                                                                   |
| (Durneva et al., 2020)           | Interoperability                                   | Systematic review of the application of blockchain technology in patient care                                                                                                                               |
| (Edwards et al., 2010)           | Interoperability                                   | Literature review about barriers to health information exchange                                                                                                                                             |
| (Ford et al., 2009)              | Linkage                                            | Establishment of a research databank (Huhtala et al.) of health and well-being personal data that safely gathers information from different types of data sources                                           |
| (Furukawa et al., 2013)          | Interoperability                                   | Internal and external exchange trends of hospital electronic health data                                                                                                                                    |
| (Gamal et al., 2021)             | Interoperability                                   | Overview and review of the current state of database management systems that stores standardized electronic health record data                                                                              |
| (Genevieve et al., 2019)         | Interoperability & Linkage                         | Systematic review of the barriers and enablers of health data sharing, linkage, and harmonization                                                                                                           |
| (Gordon & Catalini, 2018)        | Interoperability                                   | The role of blockchain technology in patient-centered interoperability                                                                                                                                      |
| (Huang et al., 2017)             | Interoperability                                   | Study cases about the implementation of information systems in the governmental healthcare sector and its challenges                                                                                        |
| (Hussien et al., 2019)           | Interoperability                                   | A systematic review about blockchain technology in the Healthcare sector                                                                                                                                    |
| (Hylock & Zeng, 2019)            | Interoperability                                   | Application of blockchain technology to a patient-centric framework as a promoter of consistent and comprehensive medical records                                                                           |
| (Ismail & Materwala, 2020)       | Interoperability                                   | Evaluation of the performance of a blockchain-based and patient-centric healthcare data management platform versus the traditional hospital data management                                                 |
| (Joda et al., 2019)              | Interoperability                                   | Health data collection, sharing, analytics, and artificial intelligence in oral healthcare practice and dental research                                                                                     |
| (Johnson et al., 2008)           | Linkage                                            | A provider-centric electronic health records platform proposal that incorporates narrative data and coded data                                                                                              |
| (Jones et al., 2014)             | Linkage                                            | Overview of the SAIL gateway (remote access) for access to a national architecture for e-health research and evaluation                                                                                     |
| (Jones et al., 2019)             | Linkage                                            | Operational overview of the SAIL databank as a health and well-being data source for research                                                                                                               |
| (Kalkman et al., 2019)           | Linkage                                            | Systematic review of the principles and norms (governance) of responsible data sharing in health research                                                                                                   |
| (Kaplan & Harris-Salamone, 2009) | Interoperability                                   | Overview and discussion of the determinants of implementation success or failure of health information technology in healthcare systems                                                                     |
| (Kasthurirathne et al., 2015)    | Interoperability                                   | Improvement of an electronic medical record system's interoperability using the fast healthcare interoperability resources (FHIR) standard instead of the Health Level 7 (HL7) standard.                    |
| (Kharrazi et al., 2017)          | Interoperability                                   | Overview and definition of population health informatics, including its data governance and management, interoperability, and standards                                                                     |
| (Koppel & Lehmann, 2015)         | Interoperability                                   | Advantages and disadvantages of having a unique electronic health record platform in hospitals and health systems.                                                                                          |
| (Krittawong et al., 2020)        | Interoperability                                   | Integrated application of blockchain and artificial intelligence to health data in the field of cardiovascular medicine                                                                                     |
| (Lavin et al., 2015)             | Interoperability                                   | Nurses' views and experiences about the use of electronic health records                                                                                                                                    |
| (Lee et al., 2020)               | Interoperability                                   | Development of an international personal health records management platform which is based on blockchain technology                                                                                         |
| (Lucyk et al., 2017)             | Linkage                                            | Barriers and challenges to obtain administrative health data of high-quality                                                                                                                                |
| (Mandel et al., 2016)            | Interoperability                                   | Development of an electronic health record platform based on FHIR standard                                                                                                                                  |
| (Masud et al., 2012)             | Interoperability                                   | Data interoperability among heterogenic patient-centric data and its sources                                                                                                                                |
| (Mohammadzadeh & Safdari, 2014)  | Interoperability                                   | Opportunities and challenges of mobile health technology in chronic disease management                                                                                                                      |
| (Oderkirk et al., 2013)          | Linkage                                            | Use and linkage of personal health data and its challenges in different countries.                                                                                                                          |
| (Park et al., 2018)              | Interoperability                                   | Creation of a smart emergency medical service based on the needs of paramedics through the development of an interoperable system that connects electronic medical records and data from monitoring devices |
| (Rezaeibagha et al., 2015)       | Interoperability                                   | Literature review that discusses the requirements for electronic health records in terms of security, privacy, and standards                                                                                |
| (Salas-Vega et al., 2015)        | Interoperability                                   | European policymakers pose challenges in the application of big data in healthcare                                                                                                                          |
| (Samra et al., 2020)             | Interoperability                                   | Overview of hospital databases' contribution to medical research by interviewing mostly healthcare professional                                                                                             |

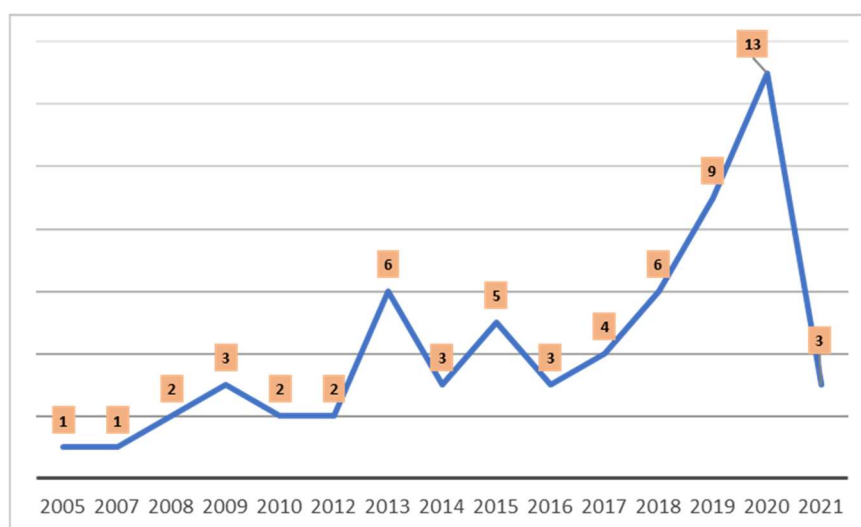
| Reference                   | Abstract with "interoperability" and/or "linkage"? | In-house overview                                                                                                                                                                              |
|-----------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Sethi & Laurie, 2013)      | Linkage                                            | Proportional information governance in health data linkage for research purposes                                                                                                               |
| (Shanbehzadeh et al., 2020) | Interoperability                                   | Interoperable reporting framework for COVID-19, which includes levels of administrative data and clinical data                                                                                 |
| (Sinaci et al., 2020)       | Interoperability                                   | Development of FAIR (findability, accessibility, interoperability, and reusability) principles-based framework using Health Level 7 FHIR standard for health data research                     |
| (Sittig et al., 2018)       | Interoperability                                   | Shared stakeholders' responsibility for the safety of electronic health records                                                                                                                |
| (Tapuria et al., 2013)      | Interoperability                                   | Role of clinical archetypes in achieving semantic interoperability of electronic health records                                                                                                |
| (van Olmen et al., 2020)    | Linkage                                            | Barriers in the implementation of mobile health platforms                                                                                                                                      |
| (Vazirani et al., 2020)     | Interoperability                                   | Role of blockchain in the management of electronic health records                                                                                                                              |
| (Vest, 2012)                | Interoperability                                   | Overview of health information exchange application in an international context                                                                                                                |
| (Warner et al., 2016)       | Interoperability                                   | Development of a mobile application based on the HL7 FHIR standard, which provides genomic health information to oncologists and their patients in real-time for precision medicine definition |
| (Witry et al., 2010)        | Interoperability                                   | Physician's views about the possible benefits and concerns in the use of personal health records from providers and patients                                                                   |
| (Wollersheim et al., 2009)  | Interoperability                                   | Literature review about archetype-based electronic health records relevant to health information managers                                                                                      |

Note: All references are journal articles except for (Ammar et al., 2020) (which is a conference proceeding).

Source: Costa et al. (2024), supplemental material

As for the sample timeline (Figure 6), the first article emerged in 2005. From 2017 to 2012, there was an average of 2 research papers a year while from 2013 to 2016 these average duplicates its value. From that year, the number of research papers increased exponentially, reaching a maximum of 13 articles in 2020. Only three research papers are from 2021. There are only two gap years, namely 2006 and 2011.

Figure 6. Sample timeline overview



An in-house overview was also produced for each reference type to summarize their content (Table 3). A word cloud software generator (WordArt.com) was also used to visualize the overview's main topics (see Figure 7). The most prominent words are “Health,” “Data,” “Record,” “Electronic” and “Review.” The second level of words consists of “Standard,” “Blockchain,” “System,” “Interoperable,” “Information” and “Application.” In a third level, words such as “Healthcare,” “Patient,” “Managers,” “Personal,” “Barriers,” “Hospital” and “Linkage” are found in this final analysis.

Figure 7. Sample overview by a word cloud software generator



### 2.3.3. Article citation analysis

According to the data retrieved and exported to Table 4, the highest number of citations was achieved by Koppel and Lehmann (2015) while the lowest was obtained by (Ammar et al., 2021). As for the average number of citations per year, Gordon and Catalini (2018) had the highest average as Ammar et al. (2021) continued to have the lowest one.

Table 4. Reference characterization and its global impact ranking

| Reference                 | Type of Publication | Publication name                                          | Number of citations (a) | Average number of citations per year (b) | Reference global impact ranking (a) x (b) |
|---------------------------|---------------------|-----------------------------------------------------------|-------------------------|------------------------------------------|-------------------------------------------|
| (Gordon & Catalini, 2018) | Journal Article     | Computational and Structural Biotechnology Journal (CSBJ) | 472                     | 118                                      | 1                                         |

| Reference                        | Type of Publication | Publication name                                                | Number of citations (a) | Average number of citations per year (b) | Reference global impact ranking (a) x (b) |
|----------------------------------|---------------------|-----------------------------------------------------------------|-------------------------|------------------------------------------|-------------------------------------------|
| (Mandel et al., 2016)            | Journal Article     | Journal of the American Medical Informatics Association (JAMIA) | 475                     | 79.17                                    | 2                                         |
| (Koppel & Lehmann, 2015)         | Journal Article     | Journal of the American Medical Informatics Association (JAMIA) | 513                     | 38.69                                    | 3                                         |
| (Kaplan & Harris-Salamone, 2009) | Journal Article     | Journal of the American Medical Informatics Association (JAMIA) | 503                     | 38.69                                    | 4                                         |
| (Detmer et al., 2008)            | Journal Article     | BMC Medical Informatics and Decision Making                     | 482                     | 34.43                                    | 5                                         |
| (Ford et al., 2009)              | Journal Article     | BMC Health Services Research                                    | 393                     | 30.23                                    | 6                                         |
| (Ahmed et al., 2020)             | Journal Article     | Database (Oxford)                                               | 142                     | 71                                       | 7                                         |
| (Bahga & Madiseti, 2013)         | Journal Article     | IEEE Journal of Biomedical and Health Informatics               | 217                     | 24.11                                    | 8                                         |
| (Bates, 2005)                    | Journal Article     | Health Affairs                                                  | 291                     | 17.11                                    | 9                                         |
| (Hussien et al., 2019)           | Journal Article     | Journal of Medical Systems                                      | 103                     | 34.33                                    | 10                                        |
| (Dinh-Le et al., 2019)           | Journal Article     | JMIR mHealth and uHealth                                        | 99                      | 33                                       | 11                                        |
| (Jones et al., 2014)             | Journal Article     | Journal of Biomedical Informatics (JBI)                         | 161                     | 20.23                                    | 12                                        |
| (Huang et al., 2017)             | Journal Article     | Globalization and Health                                        | 104                     | 20.8                                     | 13                                        |
| (Furukawa et al., 2013)          | Journal Article     | Health Affairs                                                  | 136                     | 15.11                                    | 14                                        |
| (Sittig et al., 2018)            | Journal Article     | Healthcare (Amsterdam, Netherlands)                             | 79                      | 19.75                                    | 15                                        |
| (Hylock & Zeng, 2019)            | Journal Article     | Journal of Medical Internet Research                            | 68                      | 22.67                                    | 16                                        |
| (Johnson et al., 2008)           | Journal Article     | Journal of the American Medical Informatics Association (JAMIA) | 117                     | 12.64                                    | 17                                        |
| (Lavin et al., 2015)             | Journal Article     | Online Journal of Issues in Nursing (OJIN)                      | 94                      | 13.43                                    | 18                                        |
| (Kalkman et al., 2019)           | Journal Article     | BMC Medical Ethics                                              | 54                      | 18                                       | 19                                        |
| (Mohammadzadeh & Safdari, 2014)  | Journal Article     | Medical Archives                                                | 88                      | 11                                       | 20                                        |
| (Rezaeibagha et al., 2015)       | Journal Article     | Health Information Management Journal (HIMJ)                    | 82                      | 11.71                                    | 21                                        |
| (Dubovitskaya et al., 2020)      | Journal Article     | Journal of Medical Internet Research                            | 43                      | 21.5                                     | 22                                        |
| (Witry et al., 2010)             | Journal Article     | Perspectives in Health Information Management                   | 105                     | 8.75                                     | 23                                        |
| (Krittanawong et al., 2020)      | Journal Article     | Nature Reviews Cardiology                                       | 41                      | 20.5                                     | 24                                        |
| (Jones et al., 2019)             | Journal Article     | International Journal of Population Data Science (IJPDS)        | 50                      | 16.67                                    | 25                                        |
| (Lucyk et al., 2017)             | Journal Article     | BMC Health Services Research                                    | 64                      | 12.8                                     | 26                                        |
| (Vazirani et al., 2020)          | Journal Article     | npj Digital Medicine                                            | 39                      | 19                                       | 27                                        |
| (Alonso et al., 2019)            | Journal Article     | Journal of Medical Systems                                      | 45                      | 15                                       | 28                                        |
| (Salas-Vega et al., 2015)        | Journal Article     | Health Systems & Reform (HS&R)                                  | 68                      | 9.71                                     | 29                                        |
| (Blasimme et al., 2018)          | Journal Article     | Health Affairs                                                  | 50                      | 12.5                                     | 30                                        |
| (Lee et al., 2020)               | Journal Article     | Journal of Medical Internet Research                            | 35                      | 17.5                                     | 31                                        |
| (Warner et al., 2016)            | Journal Article     | Journal of the American Medical Informatics Association (JAMIA) | 59                      | 9.83                                     | 32                                        |
| (Kharrazi et al., 2017)          | Journal Article     | Journal of the American Medical Informatics Association (JAMIA) | 53                      | 10.6                                     | 33                                        |
| (Downs et al., 2019)             | Journal Article     | BMJ Open                                                        | 38                      | 12.67                                    | 34                                        |
| (Blazona & Koncar, 2007)         | Journal Article     | International Journal of Medical Informatics                    | 83                      | 5.53                                     | 35                                        |

| Reference                     | Type of Publication    | Publication name                                                                               | Number of citations (a) | Average number of citations per year (b) | Reference global impact ranking (a) x (b) |
|-------------------------------|------------------------|------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------|-------------------------------------------|
| (Kasthurirathne et al., 2015) | Journal Article        | Journal of Medical Systems                                                                     | 56                      | 8                                        | 36                                        |
| (Edwards et al., 2010)        | Journal Article        | Journal of Healthcare Information Management (JHIM)                                            | 71                      | 5.92                                     | 37                                        |
| (Masud et al., 2012)          | Journal Article        | IEEE Transactions on Information Technology in Biomedicine                                     | 63                      | 6.3                                      | 38                                        |
| (Vest, 2012)                  | Journal Article        | Advances in Health Care Management: Health information technology in the international context | 60                      | 6                                        | 39                                        |
| (Avila et al., 2017)          | Journal Article        | Sensors                                                                                        | 42                      | 8.4                                      | 40                                        |
| (Oderkirk et al., 2013)       | Journal Article        | Health Policy                                                                                  | 56                      | 6.22                                     | 41                                        |
| (Durneva et al., 2020)        | Journal Article        | Journal of Medical Internet Research                                                           | 26                      | 13                                       | 42                                        |
| (Sethi & Laurie, 2013)        | Journal Article        | Medical Law International                                                                      | 55                      | 6.11                                     | 43                                        |
| (Wollersheim et al., 2009)    | Journal Article        | Health Information Management Journal (HIMJ)                                                   | 66                      | 5.08                                     | 44                                        |
| (Ahmadi & Aslani, 2018)       | Journal Article        | Acta Informatica Medica                                                                        | 36                      | 9                                        | 45                                        |
| (Abdekhoda et al., 2016)      | Journal Article        | Applied Clinical Informatics Journal (ACI)                                                     | 42                      | 7                                        | 46                                        |
| (Sinaci et al., 2020)         | Journal Article        | Methods of Information in Medicine                                                             | 24                      | 12                                       | 47                                        |
| (Alkraiiji et al., 2013)      | Journal Article        | Journal of Medical Systems                                                                     | 49                      | 5.44                                     | 48 = 49                                   |
| (Tapuria et al., 2013)        | Journal Article        | Healthcare Informatics Research (HIR)                                                          | 49                      | 5.44                                     | 49 = 48                                   |
| (Joda et al., 2019)           | Journal Article        | Public Health Genomics                                                                         | 27                      | 9                                        | 50                                        |
| (Ismail & Materwala, 2020)    | Journal Article        | Symmetry                                                                                       | 22                      | 11                                       | 51 = 52                                   |
| (Shanbehzadeh et al., 2020)   | Journal Article        | Journal of Education and Health Promotion (JEHP)                                               | 22                      | 11                                       | 52 = 51                                   |
| (Boyd et al., 2015)           | Journal Article        | BMC Health Services Research                                                                   | 36                      | 5.14                                     | 53                                        |
| (van Olmen et al., 2020)      | Journal Article        | Wellcome Open Research                                                                         | 17                      | 8.5                                      | 54                                        |
| (de Quiros et al., 2018)      | Journal Article        | Yearbook of Medical Informatics                                                                | 23                      | 5.75                                     | 55 = 56                                   |
| (Park et al., 2018)           | Journal Article        | IEEE Access                                                                                    | 23                      | 5.75                                     | 56 = 55                                   |
| (Gamal et al., 2021)          | Journal Article        | Journal of Biomedical Informatics (JBI)                                                        | 11                      | 11                                       | 57                                        |
| (de Moura Costa et al., 2020) | Journal Article        | Health and Technology                                                                          | 14                      | 7                                        | 58                                        |
| (Genevieve et al., 2019)      | Journal Article        | PLOS ONE                                                                                       | 16                      | 5.33                                     | 59                                        |
| (Ammar et al., 2020)          | Conference Proceedings | Studies in Health Technology and Informatics                                                   | 12                      | 6                                        | 60 = 61                                   |
| (Samra et al., 2020)          | Journal Article        | Health Information Management Journal (HIMJ)                                                   | 12                      | 6                                        | 61 = 60                                   |
| (Arul et al., 2021)           | Journal Article        | Personal and Ubiquitous Computing                                                              | 6                       | 6                                        | 62                                        |
| (Ammar et al., 2021)          | Journal Article        | JMIR Formative Research                                                                        | 5                       | 5                                        | 63                                        |

Note: For references (Alkraiiji et al., 2013) & (Tapuria et al., 2013); (Ismail & Materwala, 2020) & (Shanbehzadeh et al., 2020); (de Quiros et al., 2018) & (Park et al., 2018); (Ammar et al., 2020) & (Samra et al., 2020): the result of (a) x (b) results in a tie which means they share the same ranking.

Source: Adapted from Costa et al. (2024), p. 5-6

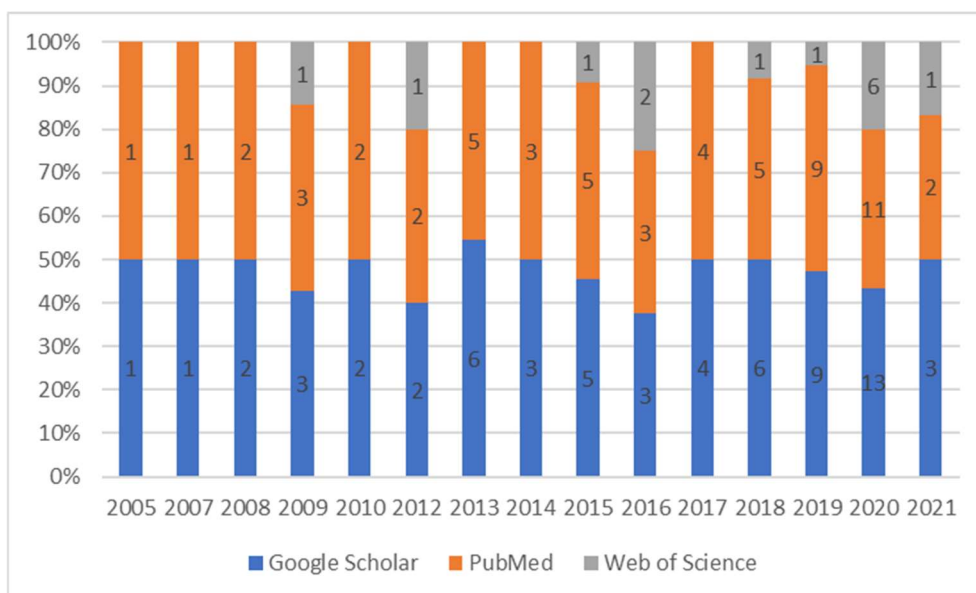
The average number of citations of all 63 articles was 101.38 while the mean value of the average number of citations per year was 17.19.

A reference global impact ranking was also established, which results from the multiplication of an average number of citations by the average number of citations per year. The top 5 publications of this ranking were (Detmer et al., 2008; Gordon & Catalini, 2018; Kaplan & Harris-Salamone, 2009; Koppel & Lehmann, 2015; Mandel et al., 2016), as the lowest five included (Ammar et al., 2020, 2021; Arul et al., 2021; Genevieve et al., 2019; Samra et al., 2020).

### 2.3.4. Search platform analysis

As defined in the research methodology, three search platforms were chosen to provide results about our subject of analysis. The selected articles were searchable heterogeneously throughout each platform. According to Figure 8, most articles were available on Google Scholar (63; 100%) and PubMed (58; 92%), while Web of Science results were scarce (14; 22%).

Figure 8. Number of results obtained in Google Scholar, PubMed and Web of Science



When analyzing the same results by year of publication, Google Scholar and PubMed appear to have identical behavior since 2005, starting markedly to diverge between 2018

and 2021, while Web of Science registers its first result in 2009, registering a boost to 6 articles out of the 13 available in 2020.

### **2.3.5. Publication analysis**

According to Table 5, the 63 references selected in this study are present in 45 different publications. Almost all these publications are journals, while only two are related to book series. The average number of references in these publications is 1.40. Regarding the citation analysis, the Journal of the American Medical Informatics Association (JAMIA) possesses the highest number of citations and the highest average number of citations per year. BMC Medical Informatics and Decision-Making publication registers the highest average number of citations per article. JMIR Formative Research publication records the lowest score in the three previously reported metrics. As for CiteScore, an Elsevier's metric based on citations indexed in the Scopus database, only 42 publications achieved a result. The highest CiteScore value was registered by Nature Reviews Cardiology publication (31.9), and the lowest was attributed to Advances in Health Care Management (0.6). The average CiteScore for the 42 publications with a result was 5.85. Another important metric is the impact factor of publications, a well-known metric from Clarivate Analytics. Only 27 publications registered a score on the impact factor metric. The highest value (49.421) was recorded by Nature Reviews Cardiology and the lowest value (1.8) by Methods of Information in Medicine publication. The average impact factor value within the publications which possessed score in this metric was 6.88. A publication global impact ranking was also established, which results from the multiplication of 4 metrics: (1) average number of citations per year; (2) average number of citations per article; (3) 2021 CiteScore; (4) 2021 impact factor. The top 5 publications of this ranking were: (1) Journal of the American Medical Informatics Association (JAMIA); (2) Computational and Structural Biotechnology Journal (CSBJ); (3) Nature Reviews Cardiology; (4) Health Affairs; (5) IEEE Journal of Biomedical and Health Informatics. The lowest 5 positions of publication global impact ranking were: (1) JMIR Formative Research; (2) Studies in Health Technology and Informatics; (3) Advances in Health Care Management; (4) Personal and Ubiquitous Computing; (5) Journal of Education and Health Promotion (JEHP).

Table 5. Publication characteristics and its global impact ranking

| Publication name                                                | ISSN      | Type of Publication | Articles per Reference | Average number of citations per year (a) | Average number of citations per article (b) | 2021 CiteScore (c) | Impact factor 2021 Journal Citation Reports (d) | Publication global impact ranking (a) x (b) x (c) <sup>a)</sup> x (d) <sup>a)</sup> |
|-----------------------------------------------------------------|-----------|---------------------|------------------------|------------------------------------------|---------------------------------------------|--------------------|-------------------------------------------------|-------------------------------------------------------------------------------------|
| Journal of the American Medical Informatics Association (JAMIA) | 1527-974X | Journal             | 6                      | 189.62                                   | 287                                         | 9,6                | 7,942                                           | 1                                                                                   |
| Computational and Structural Biotechnology Journal (CSBJ)       | 2001-0370 | Journal             | 1                      | 118.00                                   | 472                                         | 6                  | 6.155                                           | 2                                                                                   |
| Nature Reviews Cardiology                                       | 1759-5010 | Journal             | 1                      | 20.50                                    | 41                                          | 31.9               | 49.421                                          | 3                                                                                   |
| Health Affairs                                                  | 2694-233X | Journal             | 3                      | 44.72                                    | 159                                         | 9.6                | 9.048                                           | 4                                                                                   |
| IEEE Journal of Biomedical and Health Informatics               | 2168-2208 | Journal             | 1                      | 24.11                                    | 217                                         | 10.9               | 7.021                                           | 5                                                                                   |
| Database (Oxford)                                               | 1758-0463 | Journal             | 1                      | 71.00                                    | 142                                         | 6.6                | 4.462                                           | 6                                                                                   |
| BMC Medical Informatics and Decision Making                     | 1472-6947 | Journal             | 1                      | 34.43                                    | 482                                         | 4.6                | 3.298                                           | 7                                                                                   |
| Journal of Medical Systems                                      | 1573-689X | Journal             | 4                      | 62.77                                    | 63                                          | 11.5               | 4.92                                            | 8                                                                                   |
| Globalization and Health                                        | 1744-8603 | Journal             | 1                      | 20.80                                    | 104                                         | 8.7                | 10.401                                          | 9                                                                                   |
| Journal of Medical Internet Research                            | 1438-8871 | Journal             | 4                      | 74.67                                    | 43                                          | 8.2                | 7.076                                           | 10                                                                                  |
| Journal of Biomedical Informatics (JBI)                         | 1532-0480 | Journal             | 2                      | 31.23                                    | 86                                          | 8.2                | 8                                               | 11                                                                                  |
| npj Digital Medicine                                            | 2398-6352 | Journal             | 1                      | 19.00                                    | 39                                          | 11.8               | 15.357                                          | 12                                                                                  |
| JMIR mHealth and uHealth                                        | 2291-5222 | Journal             | 1                      | 33.00                                    | 99                                          | 8.2                | 4.947                                           | 13                                                                                  |
| BMC Health Services Research                                    | 1472-6963 | Journal             | 3                      | 48.17                                    | 164                                         | 3.9                | 2.908                                           | 14                                                                                  |
| Health Information Management Journal (HIMJ)                    | 1833-3575 | Journal             | 3                      | 22.79                                    | 53                                          | 5.6                | 3.778                                           | 15                                                                                  |
| Health Systems & Reform (HS&R)                                  | 2328-8620 | Journal             | 1                      | 9.71                                     | 68                                          | 4.9                | 6.378                                           | 16                                                                                  |
| International Journal of Medical Informatics                    | 1872-8243 | Journal             | 1                      | 5.53                                     | 83                                          | 8                  | 4.73                                            | 17                                                                                  |
| Healthcare (Amsterdam, Netherlands)                             | 2213-0772 | Journal             | 1                      | 19.75                                    | 79                                          | 2.5                | 3.16                                            | 18                                                                                  |
| BMC Medical Ethics                                              | 1472-6939 | Journal             | 1                      | 18.00                                    | 54                                          | 3.5                | 2.834                                           | 19                                                                                  |
| Sensors                                                         | 1424-3210 | Journal             | 1                      | 8.40                                     | 42                                          | 6.4                | 3.847                                           | 20                                                                                  |
| Health Policy                                                   | 1872-6054 | Journal             | 1                      | 6.22                                     | 56                                          | 5.2                | 3.255                                           | 21                                                                                  |
| BMJ Open                                                        | 2044-6055 | Journal             | 1                      | 12.67                                    | 38                                          | 3.9                | 3.006                                           | 22                                                                                  |
| Applied Clinical Informatics Journal (ACI)                      | 1869-0327 | Journal             | 1                      | 7.00                                     | 42                                          | 4                  | 2.762                                           | 23                                                                                  |
| IEEE Access                                                     | 2169-3536 | Journal             | 1                      | 5.75                                     | 23                                          | 6.7                | 3.476                                           | 24                                                                                  |
| Methods of Information in Medicine                              | 2511-705X | Journal             | 1                      | 12.00                                    | 24                                          | 4.5                | 1.8                                             | 25                                                                                  |
| Medical Archives                                                | 1986-5961 | Journal             | 1                      | 11.00                                    | 88                                          | 1.9                | n.a.                                            | 26                                                                                  |

| Publication name                                                                               | ISSN      | Type of Publication | Articles per Reference | Average number of citations per year (a) | Average number of citations per article (b) | 2021 CiteScore (c) | Impact factor 2021 Journal Citation Reports (d) | Publication global impact ranking (a) x (b) x (c) <sup>a)</sup> x (d) <sup>a)</sup> |
|------------------------------------------------------------------------------------------------|-----------|---------------------|------------------------|------------------------------------------|---------------------------------------------|--------------------|-------------------------------------------------|-------------------------------------------------------------------------------------|
| International Journal of Population Data Science (IJPDS)                                       | 2399-4908 | Journal             | 1                      | 16.67                                    | 50                                          | 2.2                | n.a.                                            | 27                                                                                  |
| PLOS ONE                                                                                       | 1932-6203 | Journal             | 1                      | 5.33                                     | 16                                          | 5.6                | 3.752                                           | 28                                                                                  |
| Public Health Genomics Healthcare Informatics Research (HIR)                                   | 1662-8063 | Journal             | 1                      | 9.00                                     | 27                                          | 2.9                | 2.132                                           | 29                                                                                  |
| Online Journal of Issues in Nursing (OJIN)                                                     | 2093-369X | Journal             | 1                      | 5.44                                     | 49                                          | 5.1                | n.a.                                            | 30                                                                                  |
| Symmetry                                                                                       | 1091-3734 | Journal             | 1                      | 13.43                                    | 94                                          | n.a.               | n.a.                                            | 31                                                                                  |
| Perspectives in Health Information Management                                                  | 2073-8994 | Journal             | 1                      | 11.00                                    | 22                                          | 4.3                | n.a.                                            | 32                                                                                  |
| Acta Informatica Medica                                                                        | 1559-4122 | Journal             | 1                      | 8.75                                     | 105                                         | 1.1                | n.a.                                            | 33                                                                                  |
| Wellcome Open Research                                                                         | 1986-5988 | Journal             | 1                      | 9.00                                     | 36                                          | 2.7                | n.a.                                            | 34                                                                                  |
| Yearbook of Medical Informatics                                                                | 2398-502X | Journal             | 1                      | 8.50                                     | 17                                          | 5.2                | n.a.                                            | 35                                                                                  |
| Journal of Healthcare Information Management (JHIM)                                            | 2364-0502 | Journal             | 1                      | 5.75                                     | 23                                          | 4.8                | n.a.                                            | 36                                                                                  |
| IEEE Transactions on Information Technology in Biomedicine                                     | 1943-734X | Journal             | 1                      | 5.92                                     | 71                                          | n.a.               | n.a.                                            | 37                                                                                  |
| Health and Technology                                                                          | 1558-0032 | Journal             | 1                      | 6.30                                     | 63                                          | n.a.               | n.a.                                            | 38                                                                                  |
| Medical Law International                                                                      | 2190-7196 | Journal             | 1                      | 7.00                                     | 14                                          | 3.2                | n.a.                                            | 39                                                                                  |
| Journal of Education and Health Promotion (JEHP)                                               | 2047-9441 | Journal             | 1                      | 6.11                                     | 55                                          | 0.9                | n.a.                                            | 40                                                                                  |
| Personal and Ubiquitous Computing                                                              | 2319-6440 | Journal             | 1                      | 11.00                                    | 22                                          | 1.2                | n.a.                                            | 41                                                                                  |
| Advances in Health Care Management: Health information technology in the international context | 1617-4917 | Journal             | 1                      | 6.00                                     | 6                                           | 6.1                | n.a.                                            | 42                                                                                  |
| Studies in Health Technology and Informatics                                                   | 1474-8231 | Book Series         | 1                      | 6.00                                     | 60                                          | 0.6                | n.a.                                            | 43                                                                                  |
| JMIR Formative Research                                                                        | 1879-8365 | Book Series         | 1                      | 6.00                                     | 12                                          | 1.4                | n.a.                                            | 44                                                                                  |
|                                                                                                | 2561-326X | Journal             | 1                      | 5.00                                     | 5                                           | 1.8                | n.a.                                            | 45                                                                                  |

<sup>a)</sup> This part of the formula is not applied if the metric is n.a.

Source: Adapted from Costa et al. (2024), p. 7

Another pertinent analysis is the assessment of the subjects associated with the identified publications. According to Table 6 and using data from Scopus database, the most prominent subjects are Medicine and Health Sciences.

Table 6. Publication subject characterization and quantification within the publication global impact ranking

| Publication subject <sup>a)</sup>            | Publication global impact ranking <sup>b)</sup> |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Absolute number of publication subjects |       |        | Relative number of publication subjects (%) |       |        |          |
|----------------------------------------------|-------------------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|-----------------------------------------|-------|--------|---------------------------------------------|-------|--------|----------|
|                                              | 1                                               | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                      | Top 5 | Top 20 | Total 45                                    | Top 5 | Top 20 | Total 45 |
| Agricultural and Biological Sciences         |                                                 |   |   |   |   | X |   |   |   |    |    |    |    |    |    |    |    |    |    |                                         | 0     | 1      | 1                                           | 0.00  | 5.00   | 2.22     |
| Biochemistry, Genetics and Molecular Biology |                                                 | X |   |   |   | X |   |   |   |    |    |    |    |    |    |    | X  |    |    |                                         | 1     | 3      | 6                                           | 20.00 | 15.00  | 13.33    |
| Chemical Engineering                         |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                         | 0     | 0      | 1                                           | 0.00  | 0.00   | 2.22     |
| Chemistry                                    |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    | X  |    |                                         | 0     | 1      | 2                                           | 0.00  | 5.00   | 4.44     |
| Computer Science                             |                                                 | X |   |   | X | X | X | X |   | X  | X  |    |    |    |    |    |    |    |    |                                         | 2     | 7      | 14                                          | 40.00 | 35.00  | 31.11    |
| Decision Sciences                            |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                         | 0     | 0      | 2                                           | 0.00  | 0.00   | 4.44     |
| Engineering                                  |                                                 |   |   |   |   | X |   |   |   |    |    |    |    |    |    |    | X  |    |    |                                         | 1     | 2      | 7                                           | 20.00 | 10.00  | 15.56    |
| General                                      |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                         | 0     | 0      | 1                                           | 0.00  | 0.00   | 2.22     |
| Health Professions                           |                                                 |   |   |   |   | X |   | X |   |    | X  |    |    |    | X  |    |    |    |    |                                         | 1     | 4      | 8                                           | 20.00 | 20.00  | 17.78    |
| Health Sciences                              | X                                               |   | X | X | X |   | X | X | X | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X                                       | 4     | 17     | 37                                          | 80.00 | 85.00  | 82.22    |
| Life Sciences                                |                                                 | X |   |   |   | X |   |   |   |    |    |    |    |    |    |    |    | X  |    |                                         | 1     | 3      | 6                                           | 20.00 | 15.00  | 13.33    |
| Materials Science                            |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                         | 0     | 0      | 1                                           | 0.00  | 0.00   | 2.22     |
| Mathematics                                  |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                         | 0     | 0      | 1                                           | 0.00  | 0.00   | 2.22     |
| Medicine                                     | X                                               |   | X | X | X |   | X | X | X | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X                                       | 4     | 17     | 35                                          | 80.00 | 85.00  | 77.78    |
| Nursing                                      |                                                 |   |   |   |   |   |   |   |   |    |    |    |    | X  |    |    | X  |    |    |                                         | 0     | 2      | 4                                           | 0.00  | 10.00  | 8.89     |
| Physical Sciences                            |                                                 | X |   |   | X | X | X | X |   | X  | X  |    |    |    |    |    |    | X  |    |                                         | 2     | 8      | 17                                          | 40.00 | 40.00  | 37.78    |
| Physics and Astronomy                        |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | X  |    |    |                                         | 0     | 1      | 2                                           | 0.00  | 5.00   | 4.44     |
| Social Sciences                              |                                                 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    | X  |    |                                         | 0     | 1      | 5                                           | 0.00  | 5.00   | 11.11    |

a) Data retrieved from Scopus database.

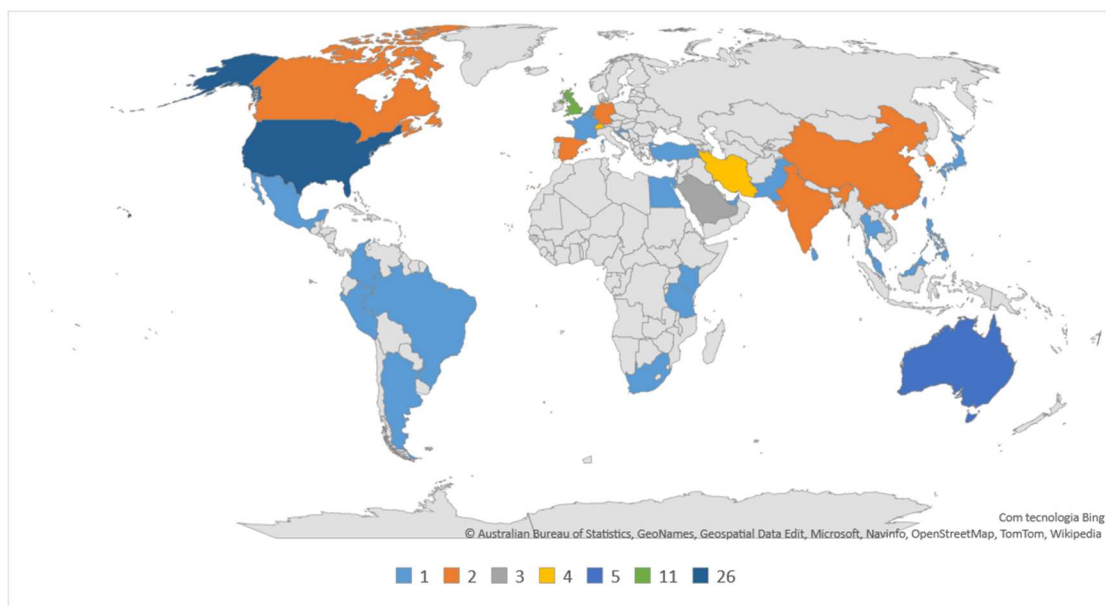
b) X represents the presence of the publication subject in the publication global impact ranking.

A second level of relevant subjects include Physical Sciences and Computer Science while a third level include Health Professions, Engineering, Life Sciences, Social Sciences and the Biochemistry, Genetics and Molecular Biology subject. Of the 18 subjects identified, only 55.56% are present in the Top 5 publications identified through the publication global impact ranking. This number increases to 83.33% when associated with the Top 20 publications.

### 2.3.6. Authors' country of origin analysis

In the 63 articles targeted for study, the average of authors per article was 5 and maximum and minimum number of authors per article was 15 and 1, respectively. Most of the articles had between 2 and 5 authors (48 articles; 76.19%). According to Figure 9, the identified 35 countries were associated with at least one article. The country most represented was the United States with 26 articles associated (41.27%), followed by United Kingdom with 11 articles (17.46%) and Australia with 5 articles (7.94%). Iran and Switzerland are only present in 4 articles, while Saudi Arabia is only present in 3. Only six countries (Canada; China; Germany; India; South Korea; Spain) are represented in 2 research papers as 23 countries are only present in 1 article.

Figure 9. Geographical distribution of articles according to their authors' origin



Source: Costa et al. (2024), p. 5

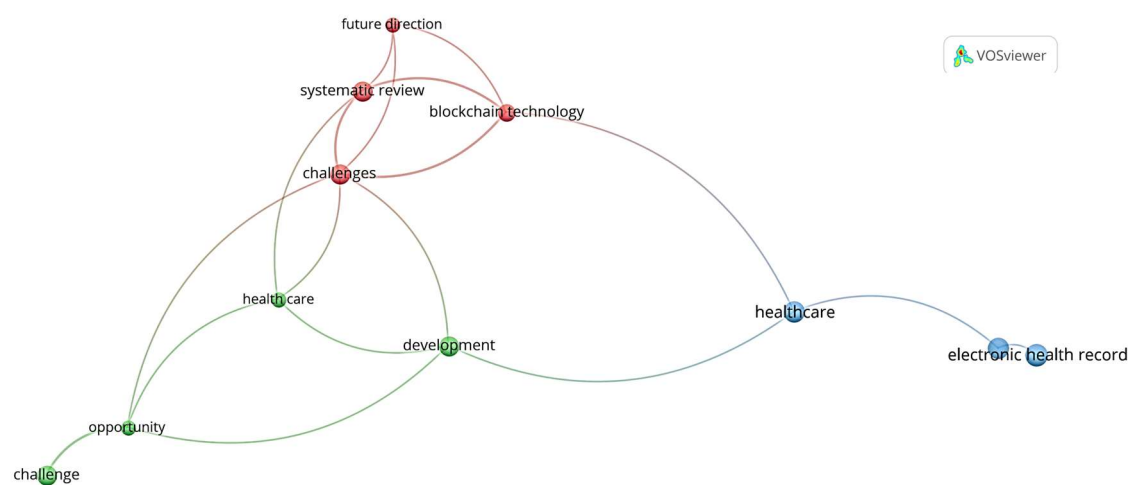
### 2.3.7. Authors' keyword analysis

As previously stated, the author's keywords of the papers were taken manually and inserted into a database. The word cloud software generator (WordArt.com) was used

The database generated in Endnote was exported and evaluated using the VOSviewer software. The analysis was based on the information in the article's title and abstract. Three dimensions were targeted for evaluation: (1) network visualization, (2) overlay visualization and (3) density visualization. The first dimension showed the level of relationship between words, providing information about potential word clusters, and allowing their naming (via word analysis), for better understanding. The overlay visualization showed which words and clusters are trending. The final dimension complemented the network visualization by presenting simplified information about each word's relevance.

The network visualization analysis found the existence of three clusters (see Figure 11). The first cluster (*e-health information future trends*) is consisted of the words “blockchain technology,” “challenges,” “future direction,” and “systematic review.” The second cluster (*e-health information uncertainty*) has in its composition the terms “challenge,” “development,” “health care,” and “opportunity.” Words such as “electronic health record,” “evaluation” and “healthcare” formulate the final cluster (*e-health information quality assessment*).

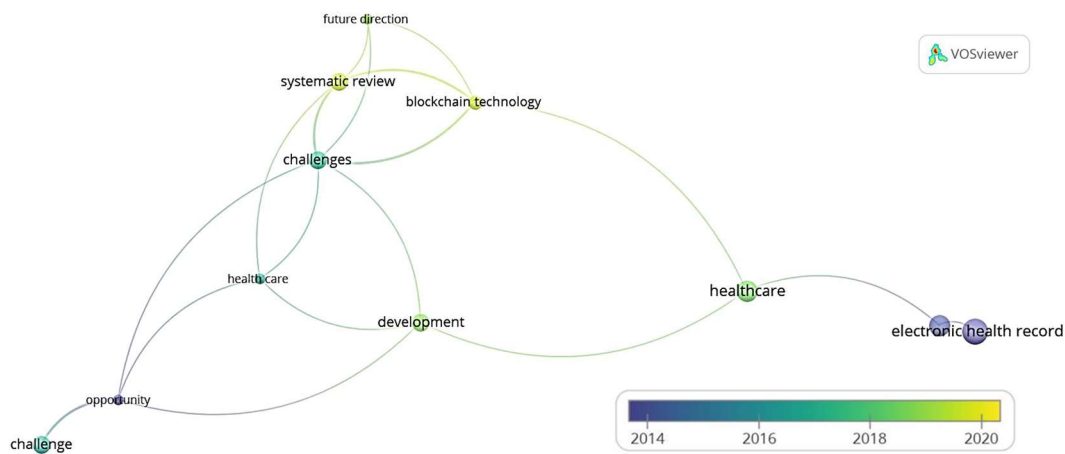
Figure 11. Title analysis performed by VOSviewer network visualization



Source: Adapted from Costa et al. (2024), supplemental material

When observing the same data display in overlay visualization (see Figure 12), the three clusters appear to have an increasing chronological appearance, as the *e-health information future trends* cluster seems to be discussed later in 2020, while the *e-health information uncertainty* emerges mainly between 2015 and 2018. The oldest cluster is the *e-health information quality assessment*.

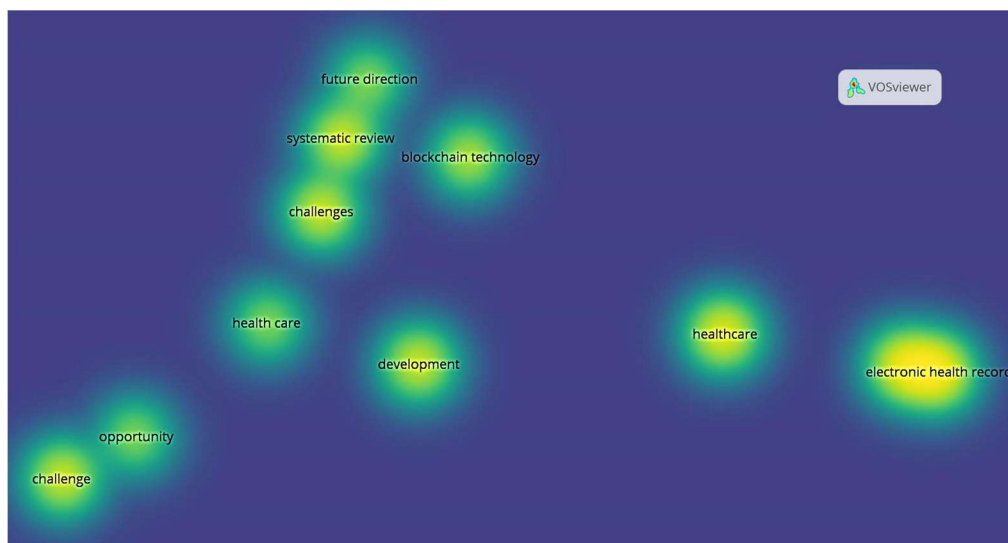
Figure 12. Title analysis performed by VOSviewer overlay visualization



Source: Adapted from Costa et al. (2024), supplemental material

The density analysis performed in Figure 13 showed that the distribution of occurrences of words in all three clusters is similar. The *e-health information quality assessment* cluster is the most homogeneous, while the other two clusters are slightly heterogeneous.

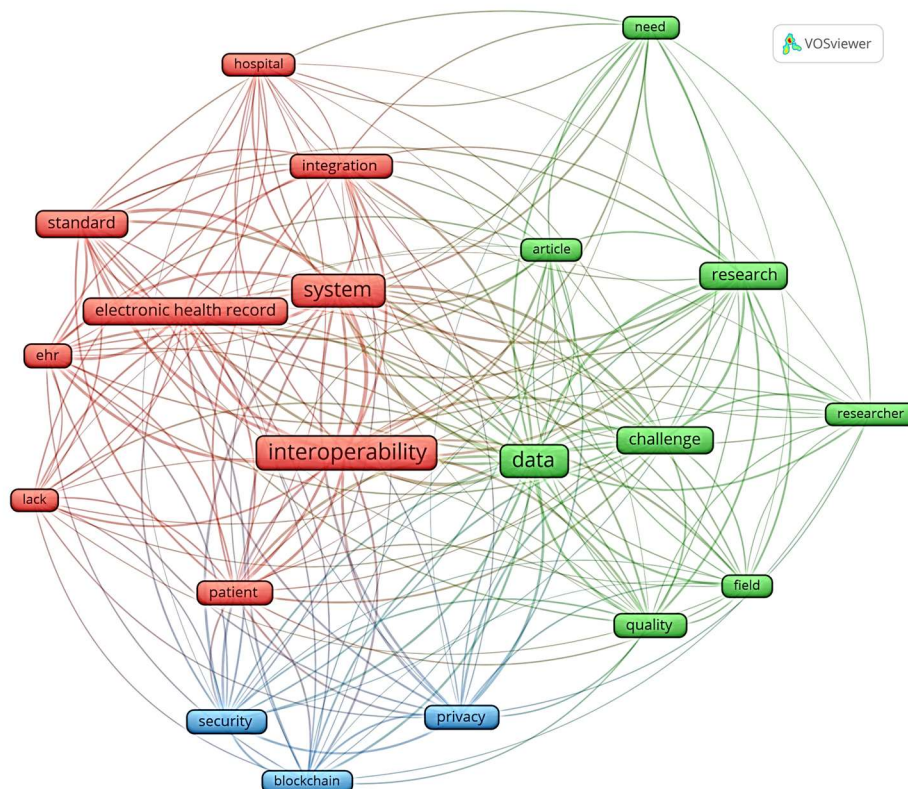
Figure 13. Title analysis performed by VOSviewer density analysis



Source: Adapted from Costa et al. (2024), supplemental material

The abstract analysis displayed in Figure 14 revealed increased relations between words when compared with the title analysis. In accordance with the title evaluation, the network visualization analysis also presented three clusters. The first cluster (*e-health information stakeholder needs*) consists of the words “EHR,” “electronic health record,” “hospital,” “integration,” “interoperability,” “lack,” “patient” “standard”, and “system”. The second cluster (*e-health information quality assessment*) has in its composition the terms “article”, “challenge”, “data”, “field”, “need”, “quality”, “research” and “researcher”. The final cluster (*e-health information technological governance trends*) is related to the words “blockchain”, “privacy” and “security”.

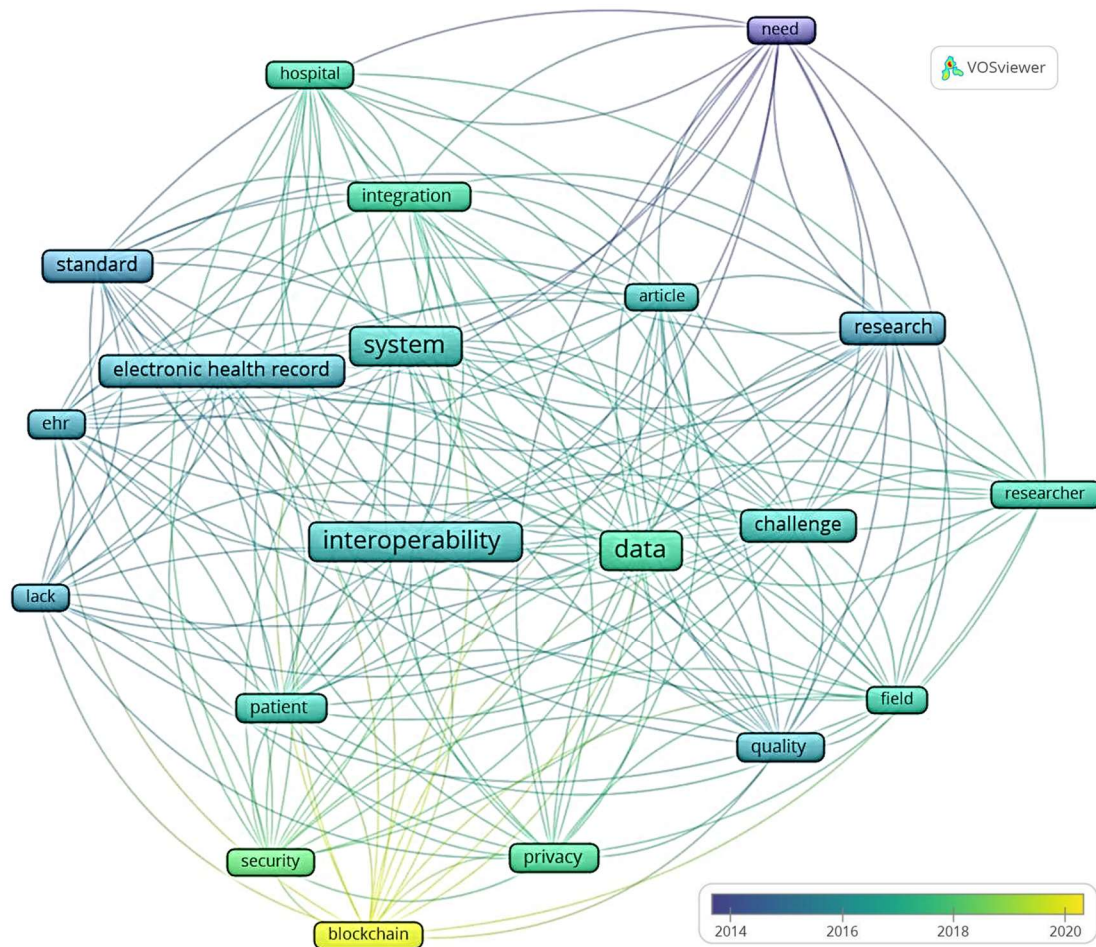
Figure 14. Abstract analysis performed by VOSviewer network visualization



Source: Adapted from Costa et al. (2024), supplemental material

In terms of timeline analysis (see Figure 15), the *e-health information technological governance trends* cluster is the most recent one, while the other two clusters seem to be within the years 2015 and 2018.

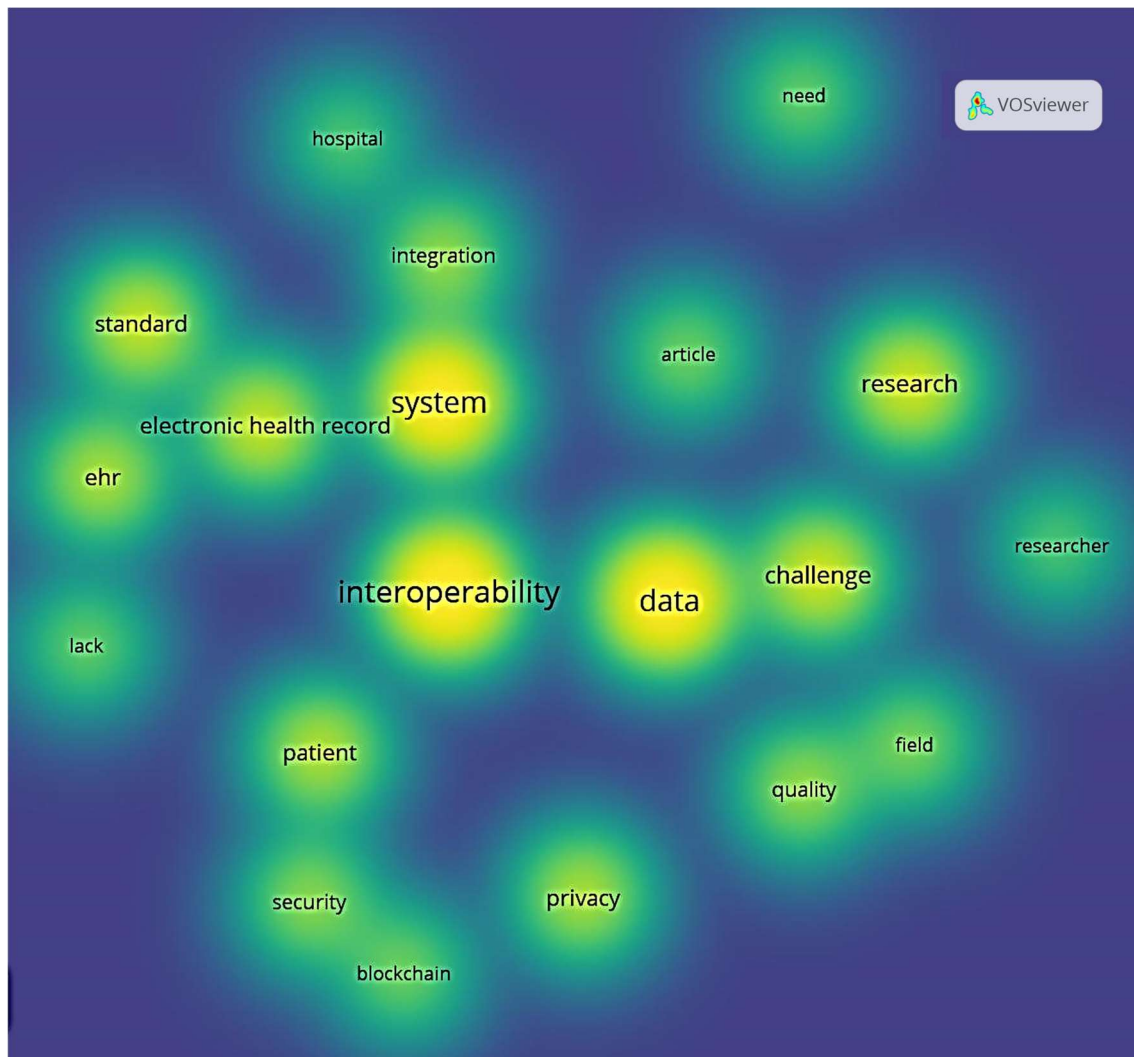
Figure 15. Abstract analysis performed by VOSviewer overlay visualization



Source: Adapted from Costa et al. (2024), supplemental material

When data is displayed considering the number of occurrences, the density analysis (see Figure 16) revealed that the most prominent words in the *e-health information stakeholder need* cluster were “interoperability” and “system,” with 48 and 44 occurrences, respectively. As for the *e-health information quality assessment* cluster, words such as “data” (45 occurrences), “challenge”, and “research” (both with 26 occurrences) are the core of the cluster. “Privacy” (20 occurrences) is the leading word in the *e-health information technological governance trends* cluster.

Figure 16. Abstract analysis performed by VOSviewer density analysis



Source: Adapted from Costa et al. (2024), supplemental material

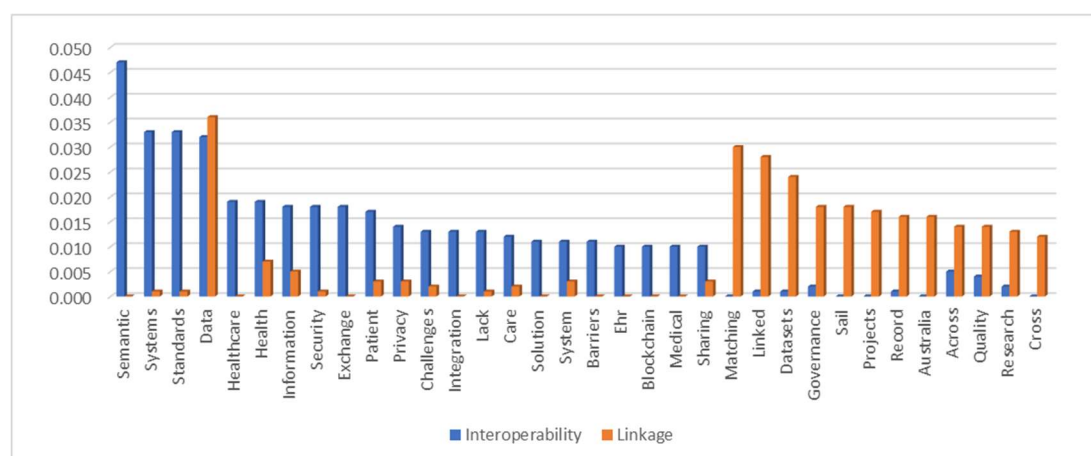
### 2.3.9. Analysis of WORDSTAT software

The phrase extraction analysis performed by WORDSTAT software was defined to provide 1,000 results (see Figure 17). The results with a frequency above 200 were the following: (1) health information; (2) health care; (3) electronic health; (4) health records; (5) health data; (6) big data; (7) health record; (8) data sharing; (9) personal health; (10) blockchain technology; (11) clinical data; (12) public health; (13) electronic health



(8) security; (9) exchange; (10) patient; (11) privacy; (12) integration; (13) lack. As for the word “linkage,” the following results emerged: (1) data; (2) matching; (3) linked; (4) datasets; (5) governance; (6) sail; (7) projects; (8) record; (9) Australia; (10) across; (11) quality; (12) research. The only word with similar proximity between the two words in the analysis is “data.”

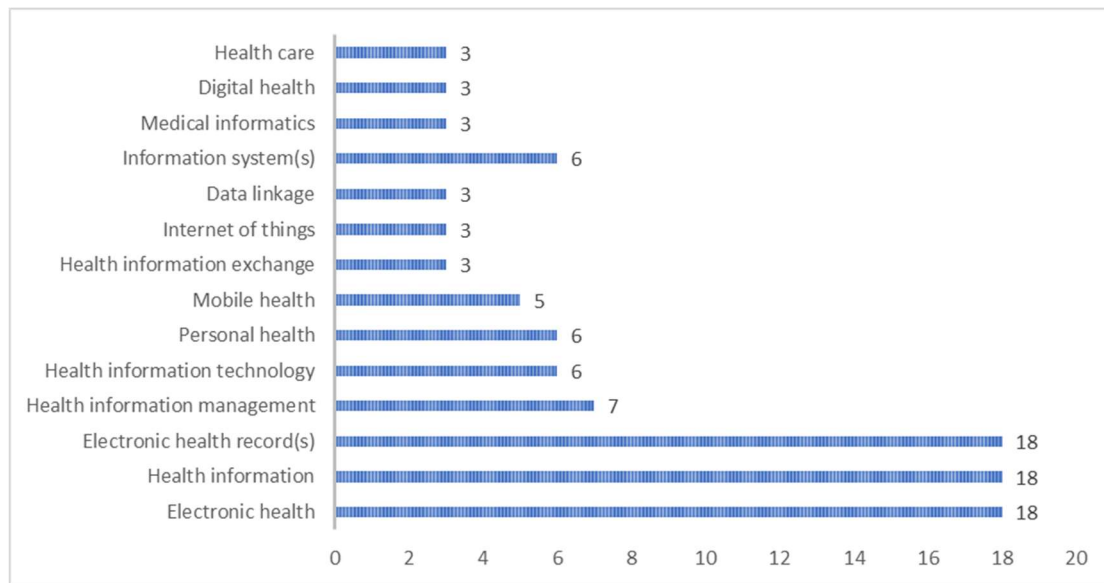
Figure 18. Proximity of keywords analysis by WORDSTAT: interoperability vs. linkage



Source: Adapted from Costa et al. (2024), p. 9

Another analysis was conducted using WORDSTAT software (phrase analysis) to obtain the most common words in the authors' keywords. Afterward, these data were processed using Excel (see Figure 19). According to the data retrieved, the most common keywords are “electronic health record(s),” “health information,” and “electronic health,” all with the same frequency. A second cluster of frequent keywords could be identified, which included the keywords “health information management,” “health information technology,” “information system(s),” “personal health,” and “mobile health.” The last frequent keyword cluster is composed by the keywords “health care,” “digital health,” “medical informatics,” “data linkage,” “internet of things” and “health information exchange.”

Figure 19. WORDSTAT phrase analysis of authors' keywords



## 2.4. Discussion of the bibliometric analysis results

The data-gathering process was based on the search results obtained on Google Scholar, PubMed, and Web of Science. Google Scholar was the platform that provided an astronomical number of search results when compared with PubMed and Web of Science results. However, when analyzing the selected sample, their search results appeared highly in Google Scholar and PubMed but remained low in Web of Science. According to this information, both Google Scholar and PubMed seem like effective search platforms, but only PubMed seems to be an efficient tool to provide broader and meaningful results. As for the quality of data, the results exported to Endnote revealed that the highest quality was obtained through Web of Science, followed by PubMed (lacked some abstract information). Regarding Google Scholar, several data problems were encountered, such as missing publication year, abstract information, and even some author and title information in languages other than English. This lack of data quality correlates with articles with abstract ratio in global results without duplicates, representing only 18.03%. On the other hand, the search query used in the three platforms may not guarantee the selection of the same articles, even if they are indexed in all search engine databases. For this reason, the best approach should always be to use multiple search platforms to acquire broad data after applying a rigorous sample selection process.

The selection process provided a sample consisting of 63 articles. This only represents 1,66% of the global results without duplicates and 9.25% of the articles containing abstracts. When filtering by including the words “interoperability” or “linkage” in abstracts, the percentage climbs to 29.72%. The selected articles represent 87.50 % of the results obtained when applying the average citations per year filter (article number of citations per year index  $\geq 4.94$ ), meaning that few results were out of the scope of this research (e.g., articles discussing only technical aspects, certain types of diseases, and research methodologies).

The timeline of the selected articles follows the trends verified in the several layers of data selection. The number of articles continuously increased from 2016 to 2020, decreasing abruptly in 2021. However, as the global results containing abstracts continued to grow in 2021, this could be a sign that the topics related to the scope of this research have deviated to other core subjects or that the COVID-19 pandemic urged quick solutions into the market without preoccupations about data linkage and systems interoperability.

The articles also appear to have a heterogeneous geographical distribution. Countries that contribute the most are native English-speaking countries such as the United States of America, the United Kingdom, and Australia. The rest of the world’s countries have few or zero scientific contributions, which may translate into a lack of concern towards system interoperability and data linkage. A correlation study of these findings should be addressed to verify if countries with high scientific production have better real-world performance than countries with low production, allowing global benchmarking interventions.

The reference global impact ranking is a metric that tries to eliminate the chronological bias that exists when considering only the number of citations of an article. Usually, earlier articles have a better probability of achieving a higher number of citations, diminishing the importance of recent articles with little time to accumulate possible citations. the article citations metric is not correlated with the ranking position. This ranking provides a more accurate method to evaluate the research’s impact within the scope of this research.

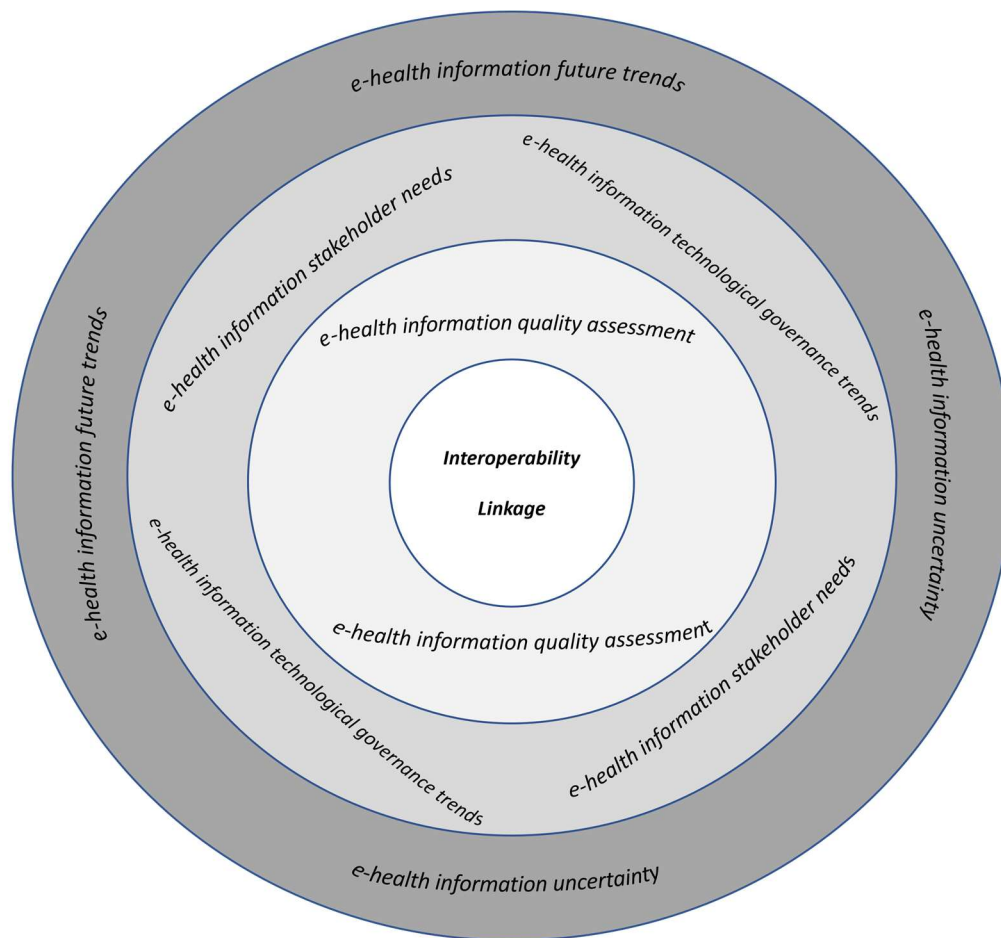
Publications are an essential part of the scientific environment. They are a vessel for research papers to reach their final consumer. Usually, researchers try to find journals with a high impact defined by standardized metrics (e.g., CiteScore and Impact factor).

However, these impact metrics are not synchronized with the narrowed scopes of research. As done in the article analysis, a more complex raking with four variables was produced to verify possible correlations and provide an evaluation associated with the scope of this investigation. The publication's global Impact ranking provided similar results to the article's global impact ranking, meaning that the cross combination between impact metrics and citation metrics did not correlate with standardized impact metrics. These findings suggest that acceptable metrics are not the best method to evaluate the power of influence of journals within specific literature subjects worldwide.

In this study, interoperability and linkage concepts seem to be separate. The abstract analysis performed in the sample selection procedure showed that most abstracts contained the word “interoperability” while “linkage” was present in only a few. Only one abstract had both words. This simple analysis demonstrates that researchers are giving more importance to interoperability than linkage, and they also do not value or neglect the potential symbiotic power within the connection between these two disciplines. Another data point to this finding is the proximity of keywords analysis performed in WORDSTAT software. Data showed that the word “interoperability” has a stronger association with more words when compared with the word “linkage.” The lack of association between these two words is also present, as only a few words with strong association are shared by them. Interestingly and in a slightly opposite direction, the WORDSTAT’s phrase extraction analysis revealed more phrases with the word “linkage” than with “interoperability”.

VOSviewer analysis originated three title clusters and three abstract clusters. As these clusters have interconnections, a theoretical framework was established as demonstrated through Figure 20.

Figure 20. Theoretical framework to achieve high quality interoperability and data linkage processes



Source: Adapted from Costa et al. (2024), p. 9

According to Figure 20, four levels were defined, representing different degrees of broadness. The outer layer is the most wide-ranging, and this complexity diminishes gradually until reaching the core. Interoperability and linkage issues in electronic health information management are uncertain as new trends emerge. To mitigate this uncertainty, stakeholders' needs such as the ones demonstrated by Witry et al. (2010), Alkrajji et al. (2013), Lavin et al. (2015), Abdekhoda et al. (2016) and Ammar et al. (2021) and governance models must be assessed so electronic health information possesses the highest degree of quality, in which system interoperability and data linkage can achieve their purpose with efficacy and efficiency.

The current bibliometric analysis has some limitations. Firstly, in the data-gathering process, results exported from the three search platforms did not generate the same quality of information when imported into EndNote, meaning that some crucial data was missing (e.g., some Google Scholar results were without year, abstract, and publication information). Due to this restriction, some meaningful articles could have been excluded from the sample selection process. Secondly, the criteria applied in the sample selection process, such as the one associated with article citations and selected keywords included in abstracts, may have enhanced the elimination of essential articles. Thirdly, sample data extracted from Endnote presented limitations when imported into software such as VOSviewer. In this way, only a few analysis tools were possible to run. However, the present study has at least three advantages. To the best of our knowledge, this is the first bibliometric research in which electronic health information is intersected with interoperability and linkage domains. Secondly, even with the previously listed limitations, it was still possible to assess the quality and evolution of the research about the subject of analysis. Finally, this research provides insights into the main topics and concerns of the role of interoperability and linkage in health information systems.

## **2.5 Adoption and acceptance models of technology and innovation in healthcare**

### **2.5.1 The technology acceptance model (TAM)**

In 1986, a new concept was developed to evaluate the core reasons influencing the acceptance of computing technologies by end-users. This concept, translated into the technology acceptance model, used several constructs (Perceived Usefulness; Perceived Ease of Use; Behavioral Intention to Use; Attitude Toward Using; Actual System in Use) and its relationships to explain the main reasons for technology adoption (Davis, 1989; Davis et al., 1989). Until 2006, studies using TAM were related to task-related, e-commerce, and hedonic systems (Hsiao & Yang, 2011). However, with time, variants of TAM were developed to evaluate a wide range of technologies and contexts. As highlighted by Palos-Sanchez et al. (2021), the ramified TAM concepts that were most significant were the TAM2 model, the unified theory of acceptance and use of technology

(UTAUT), the model for the acceptance of technology and user satisfaction, and the TAM3 model. TAM2 aggregated the background supporting PU while TAM3 was based on prior constructions towards PEU (Palos-Sanchez et al., 2021). For example, Chang (2004) and Mertins and Austermann (2014) assessed, using TAM variants, an academic intranet and managerial use of social media, respectively. Cowen and Kowalczyk (2009) developed a modified TAM to analyze the acceptance of computed radiography systems. In the healthcare sector, several studies have used TAM or its variants to understand the behavior of various healthcare stakeholders toward adopting health IT solutions (AlJarullah et al., 2018; Alsyoud et al., 2023; Chau & Hu, 2001; Edo et al., 2023; Holden & Karsh, 2010; Kamal et al., 2020; Ketikidis et al., 2012; Palos-Sanchez et al., 2021; Rahimi et al., 2018; Tsai et al., 2019). However, a systematic review demonstrated that few TAM-related studies were associated with managers and administrators while policymakers were nonexistent. Healthcare professionals and patients were among the most studied stakeholders (Rahimi et al., 2018). The TAM can also be potentiated by adding new concepts and forms of analysis that can increase the explanatory power of technology acceptance among broad and diversified numbers of healthcare stakeholders (Chau & Hu, 2001; Holden & Karsh, 2010).

### **2.5.2. Diffusion of innovation (DOI) theory**

A new concept for understanding the dissemination of technologies was firstly developed in 1962 (Rogers, 2003). Innovation was the key concept, and its communication, duration and social integration were perceived as major factors for its adoption. Moreover, innovation is required, to be effective in the adoption process of technology, to assimilate attributes such as relative advantage, compatibility, complexity, trialability and observability. As many of the innovation processes are adopted by organizations, three layers of decisions can be found in such collectivities (Rogers, 2003): (1) “optional innovation-decisions” (e.g. individual and independent decision-making; (2) “authority innovation-decisions” (e.g. minority decision-making); and (3) “collective innovation-decisions” (e.g. consensual decision-making). Studies using this theory can be found applied to the healthcare sector and involving multiple landscapes (e.g. Hawaiian islands), stakeholders and organizations (Balas & Chapman, 2018; Cote-Boileau et al., 2019; Spencer et al., 2023), some with modifications (Wainwright & Waring, 2007).

### 2.5.3. Innovation resistance and barriers frameworks

Innovation processes drive societies toward a better future. They promote efficiency in many domains, such as the technology sector and healthcare sector. However, according to Ram and Sheth (1989), potential users may manifest resistance to them even though they bring to the table positive outcomes. Such resistance may lead to new product failures. To understand innovation resistance, stakeholders need to realize that it is continuous process that can vary between passive and active resistance and very active resistance. Firstly, consumers feel discouraged from adopting innovation (e.g. due to cultural beliefs). Secondly, potential users' risk assessment can delay the adoption of innovation (e.g. due to perceived risks to their health). For example, technology adoption is particularly associated with a functional risk, meaning that if its features are not communicated properly, potential end-users will abandon it. Finally, they can view innovation as not meeting their needs and therefore retaliate (e.g. high costs of innovation) (Ram & Sheth, 1989).

Health data use can be affected by different types of barriers that arose from innovation in technology. A survey from the European Consumers Organisation (2017) identified several barriers related to health data use among European consumers. These barriers included the “heterogeneity of electronic health records”, “data privacy risks”, “legal restrictions”, “lack of adequate infrastructure”, “cybersecurity risks”, “lack of technical interoperability”, “data quality and reliability”, “lack of stakeholders' awareness”, and “lack of stakeholders' interest”. Genevieve et al. (2019) found that ethical, technical, legal, financial, and political barriers in the healthcare environment can affect data standardization, linkage, and sharing processes. Other barriers can be related to contextual, healthcare services, and regulatory environments (van Olmen et al., 2020). A study by Alkraihi et al. (2013) identified several barriers that affect health data standards use and disturb interoperability efficiency and efficacy within the healthcare system. Issues were related to (1) complexity, (2) compatibility, (3) IT infrastructure, (4) financial burden, (5) lack of adequate procedures and policies (6) resistance to change, (7) lack of stakeholders' engagement and (8) lack of harmonization. Demography, health status, stakeholders' specificities and attitudes toward health data, information usability, accessibility, and cost can also present themselves as barriers to technology adoption in the healthcare sector (Showell, 2017). The lack of technology usability and validation can

be viewed by some stakeholders as barriers affecting the acceptance of digital health technology (Palacholla et al., 2019). Patient's age was also perceived as a barrier to the adoption of health information technology (Kruse et al., 2016). Moreover, a study developed by Zhao et al. (2018) demonstrated the existence of an age-related moderating effect on the adoption of mobile health technologies. By eliminating such barriers, healthcare entities can play an imperative role in promoting of stakeholders' adherence to technology (Tsai et al., 2019). As illustrated in Table 7, all these concepts led to the proposal of six hypotheses which are well grounded in the established literature about technological adoption in healthcare. These six hypotheses allow for the replication and validation of TAM, across three key stakeholder groups: healthcare professionals, patients, and overseeing healthcare stakeholders (administrators, managers and policymakers).

Table 7. Hypotheses' theoretical evidence and explanation: H1 to H6

| Hypotheses | Statement                      | Description                                                                                                                                  | Evidence examples                                     |
|------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| H1; H2     | PEU influences PU and ATU      | This reflects the foundational logic that if a system is easy to use, users will perceive it as more useful and form more positive attitudes | (Davis, 1989; Davis et al., 1989)                     |
| H3; H4     | PU drives ATU and BIU          | Consistent with evidence that perceived usefulness is a dominant predictor of acceptance in both clinical and administrative settings        | (Chau & Hu, 2001; Holden & Karsh, 2010)               |
| H5; H6     | ATU and BIU predict system use | These hypotheses reflect the intention-behavior link, which has been extensively validated in healthcare IT adoption studies                 | (AlJarullah et al., 2018; Palos-Sanchez et al., 2021) |

#### 2.5.4. Toward an extended model for healthcare stakeholders

According to Hausvik et al. (2021), healthcare data sets can be established by both clinical (patient clinical history, allergies, and laboratory outcomes) and administrative information (demographic, socioeconomic, financial, and logistical data). Healthcare data related to patients can be useful to several healthcare stakeholders. However, clinical and technological information perspectives can have a high degree of concordance between some stakeholders, while logistic data can be more divergent (Reading & Merrill, 2018).

Healthcare systems possess unmet data needs that can affect healthcare stockholders' performance (Gauld et al., 2014). These data needs can have different importance levels

within each healthcare institution (Said & Tolba, 2021). According to Hassey et al. (2001), data such as morbidity registers, prescribing, appointments, laboratory testing, and immunizations must be assessed to ensure data validity and reliability, so useful electronic health records for general practitioners can be established. The heterogeneity of information needs is also present between physicians and nurses. Physicians have numerous needs, mainly related to diagnostics, specific treatments, patient information, and guidelines for patient care, while nurses' needs are more associated with day-to-day activities such as pharmaceutical treatments and diagnostics (Kostagiolas et al., 2014). Policymakers and healthcare professionals recognize the importance of cost information to be appropriately supplied to consumers (Carroll & Lord, 2016). Hospital pharmacists from the Azores archipelago highlighted the importance of the socioeconomic impact of antibiotic leftovers on antimicrobial resistance and healthcare spending (Costa et al., 2021). Dataset utility can also be a determinant for achieving healthcare professionals' purposes. Gordon et al. (2021) proposed a framework to measure the healthcare dataset's utility and bring value to users and data guardians. Moreover, Doll et al. (2024) stated that there must be a focus on data utility through establishing a health data-informed workforce. The utility of data can also have a key role in the performance of healthcare stakeholders. Its assessment can be crucial for users and data overseers (Gordon et al., 2021). According to Reading and Merrill (2018), patients and providers are among the principal stakeholders in the collection and use of health data generated by patients. These stakeholders possess a high degree of convergence regarding their clinical data (e.g., data interpretation and contextual metadata, technological data (e.g., flexible data entries), and some logistic data (e.g., convenience and usability). For example, customizable data entries can encourage patients to self-monitor their health (Reading & Merrill, 2018). Personal health records systems in the United States, the United Kingdom, and Europe allow patients to access their provider's electronic clinical record, submit health data, and self-manage it. Information about immunization, allergies, appointments, diagnostics, medicines, exam results, anthropometric values, and vital signs is among the accessible data (Pagliari et al., 2007). In Portugal, patients have access to several types of health information, including vaccination status, pathologies, allergies, medication-related information, exams, and even multipurpose certificates (Gómez-Bravo et al., 2024). A Portuguese study by Sa et al. (2016) revealed that patients can assign different levels of importance to several medical activities (e.g., vaccination, laboratory tests, exams,

smoking habits, etc.). The perceived utility of health data can also improve patients' engagement by increasing their motivation to use their health data (van Kessel et al., 2024). Evaluating healthcare stakeholders' needs can bring efficiency to the healthcare technology landscape (Costa et al., 2024). Moreover, knowledge about stakeholders' desires can promote electronic access to medical data (Thielmann et al., 2024). Increased access to data and easy-to-use technology can fulfill stakeholders' needs and desired outcomes (Meier, 2013). In this way, knowledge about barriers is crucial for tackling such impediments to healthcare data access. Therefore, barriers affecting technology in healthcare systems should be assessed to promote efficiency in the healthcare provision (Carayon et al., 2019). The previous theoretical background permitted the formulation of hypotheses (which are summarized on Table 8) for the new constructs added to a new extended version of the TAM.

Table 8. Hypotheses' theoretical evidence and explanation: H7 to H12

| Hypotheses    | Statement                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                        | Evidence examples                                  |
|---------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| H7            | PBDA affects ATU                               | This hypothesis explores whether perceived barriers (such as system heterogeneity, privacy risks, or lack of infrastructure) influence stakeholders' attitudes toward the system. Literature highlights these as common barriers to digital health adoption, making it crucial to test their impact empirically in under-researched settings like the Azores.                                                      | (Genevieve et al., 2019; Palacholla et al., 2019)  |
| H8; H9        | PUD influences PU;<br>PID influences BIU       | These hypotheses build on the idea that stakeholders are not only influenced by ease of use but also by how useful or important the available data is to their specific roles. For example, a pharmacist may value data on antimicrobial use, whereas a policymaker might prioritize cost-effectiveness indicators. This aligns with frameworks which emphasize dataset utility in driving stakeholder engagement. | (Costa et al., 2021; Gordon et al., 2021)          |
| H10; H11; H12 | PID impacts BIU;<br>PUD influences ATU and BIU | Prior studies have indicated that data relevance and personalization are key motivators of technology adoption, especially in self-managed care environments                                                                                                                                                                                                                                                       | (Reading & Merrill, 2018; van Kessel et al., 2024) |

## **CHAPTER III – RESEARCH FRAMEWORK AND METHODOLOGY**

Healthcare data is one of the most important assets to healthcare stakeholders as it contributes to the decision-making process. Several instruments allow electronic access to healthcare data so stakeholders may fulfill their purposes and objectives (Hoeyer et al., 2024; Meier, 2013). Patients and healthcare professionals are the most common stakeholders associated with the use of electronic systems to access healthcare data. For example, patients have multiple ways to receive health information about their health status (Ammar et al., 2020). Barker and Richwine (2023) reported that some of these ways include technologies that can consist of web portals, patient portal apps, or, more recently, third-party apps. In Portugal, the SNS24 app and portal are the main governmental tools that allow registered patients to access health data and services (Gómez-Bravo et al., 2024). However, managers, administrators, and policymakers are the ones who define the landscape in which electronic platforms are deployed in healthcare systems. This plenitude of perspectives and needs must be assessed to improve, for example, system interoperability and data linkage within healthcare IT systems (Costa et al., 2024). Comparison between all these stakeholders' perspectives can evaluate the IT landscape and promote optimizations to existing or new IT technologies to access healthcare data. One of the most common ways to assess technologies is by analyzing data gathered from their stakeholders (AlJarullah et al., 2018; Chau & Hu, 2001; Edo et al., 2023; Holden & Karsh, 2010; Hossain et al., 2019). Surveys or questionnaires associated with Likert scales are useful instruments to collect data about stakeholders' perspectives. Research by Sullivan and Artino (2013) and Norman (2010) suggested that Likert-scale assessments can be performed using parametric tests, even when normal distribution is absent, as it can provide higher quality results when compared to non-parametric tests. Accordingly, studies using a 5-point Likert-scale questionnaire and a one-way ANOVA tool were performed on some healthcare stakeholders to evaluate their perceptions about healthcare IT issues (Al-Harbi, 2011; Jacobs et al., 2016; Pflugeisen & Mou, 2017). (Jacobs et al., 2016). In accordance with the previous statement, research from Calero Valdez et al. (2009), which included a technology acceptance model analysis, used a ANOVA tool approach to analyze the patients' age impact on different knowledge

domains used in diabetes management via small screen equipment. PLS-SEM is another useful analytical instrument to accomplish a relationship analysis among constructs using p-value to assess the formulated hypotheses' significance (Kock, 2016). Several studies using this PLS-SEM approach were performed on different healthcare stakeholders to analyze their perspectives on IT healthcare solutions (Alsyof et al., 2023; Duarte & Pinho, 2019; Edo et al., 2023; Hossain et al., 2019; Mutonyi et al., 2021; Palos-Sanchez et al., 2021; Popa et al., 2022). An effective evaluation of health IT systems can be obtained from multiple perspectives and methodologies and by including technical, economic, and organizational views (Shahmoradi et al., 2007).

### 3.1. Research framework

The current study proposes to evaluate healthcare stakeholders' perspectives on the electronic system used to access healthcare data in the Autonomous Region of the Azores. Two analytical tools (one-way ANOVA and PLS-SEM) were chosen to analyse the application of the traditional technology acceptance model associated with the perceived barriers impeding electronic access to healthcare data, the utility of data for healthcare professionals for their professional use and the importance of data to increase the quality of the healthcare system. Several hypotheses were postulated in Table 9, based on this chapter introductory note and the theoretical background discussed in Chapter I (see Table 10 for extra details), to assess the different views of each group of healthcare stakeholders (one-way ANOVA) and the relationships between different constructs that could influence their use of electronic systems to access healthcare (PLS-SEM).

Table 9. Hypotheses definition

| Hypotheses             | Statement                                                                                                                                          | Analytical tool |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| H0 <sup>a) b) c)</sup> | There is no significant difference between the means of the tested dependent variables among the different groups of healthcare stakeholders       | one-way ANOVA   |
| Ha <sup>a) b) c)</sup> | At least one group of healthcare stakeholders differs significantly from the mean of the tested dependent variable                                 |                 |
| H1 <sup>a) b) c)</sup> | Healthcare stakeholders' perceived ease of use of the electronic system to access healthcare data influences their perceived usefulness of it.     | PLS-SEM         |
| H2 <sup>a) b) c)</sup> | Healthcare professionals' perceived ease of use of the electronic system used to access healthcare data influences their attitude toward using it. |                 |
| H3 <sup>a) b) c)</sup> | Healthcare professionals' perceived usefulness of the electronic system in accessing healthcare data influences their attitude.                    |                 |

| Hypotheses             | Statement                                                                                                                                                                     | Analytical tool |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| H4 <sup>a) b) c)</sup> | Healthcare professionals' perceived usefulness of the electronic system to access healthcare data influences their behavioral intention to use it.                            |                 |
| H5 <sup>a) b) c)</sup> | Healthcare professionals' attitude toward using the electronic system to access healthcare data influences their behavioral intention to use it.                              |                 |
| H6 <sup>a) b) c)</sup> | Healthcare stakeholders' behavioral intention to use the electronic system to access healthcare data influences their actual use of it.                                       |                 |
| H7 <sup>a) b) c)</sup> | The barriers to accessing electronic health data perceived by healthcare stakeholders influence their attitude towards using the electronic system to access healthcare data. |                 |
| H8 <sup>a) b) c)</sup> | The usefulness of specific data perceived by healthcare stakeholders influences their perceived usefulness of the electronic system in accessing healthcare data.             |                 |
| H9 <sup>a) c)</sup>    | The importance of specific data perceived by healthcare stakeholders influences their behavioral intention to use the electronic system to access healthcare data.            |                 |
| H10 <sup>b)</sup>      | The importance of specific data perceived by healthcare stakeholders influences their attitude toward using the electronic system to access healthcare data.                  |                 |
| H11 <sup>b)</sup>      | The usefulness of specific data perceived by healthcare stakeholders influences their attitude toward using the electronic system to access healthcare data.                  |                 |
| H12 <sup>b)</sup>      | The usefulness of specific data perceived by healthcare stakeholders influences their behavioral intention to use the electronic system to access healthcare data.            |                 |

a) Healthcare professionals

b) Patients

c) Overseeing healthcare stakeholders (administrators, managers, and policymakers)

## 3.2. Research methodology

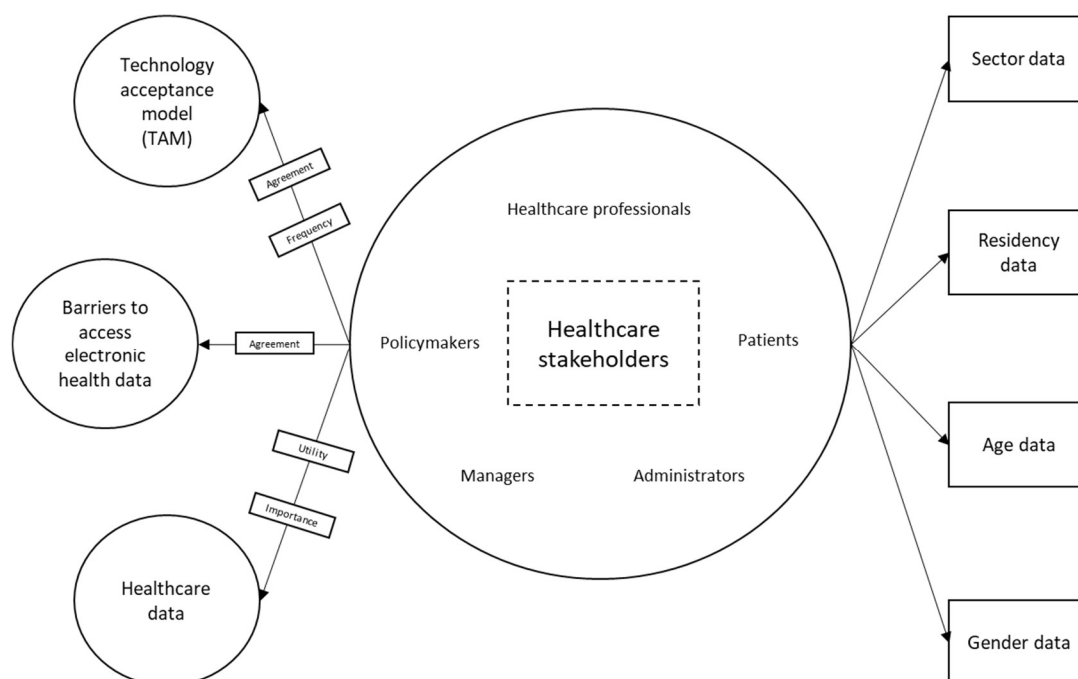
### 3.2.1. Survey characteristics and framework

Healthcare systems can present themselves as a complex network of different administrative routes and geographical restrains. Within them, ramifications of specific healthcare systems can be created to address certain specific needs of regional and local populations. The archipelago of the Azores is a well-known example of such specific system. This Portuguese archipelago, composed by nine islands, comprehends a total area per island between 745,8 km<sup>2</sup> and 17,2 km<sup>2</sup> (according to official data from the Regional Government of Azores), registers a population per island that varies between 133.288 and 470 inhabitants (according to Statistics Azores's Census 2021). Moreover, it possesses political, legislative, administrative, financial and patrimonial autonomy, attributed by the Political and Administrative Statute of the Autonomous Region of the Azores. In this way, a specific autonomous regional health service was stablished, were its organisation, planning, operation, financing and personnel are under the Azorean government authorities. Several attributes make this collection of islands a perfect living laboratory. Firstly, the population living there is subjected to geographical and healthcare

confinement (between the islands and Portugal's mainland), as only three islands possess an hospital (São Miguel Island, Terceira Island and Faial Island), while the other six only have primary healthcare centres. Moreover, a combination of urban and rural population is present which can be important for obtaining heterogenous samples. These characteristics can be shared with other worldwide ultra-peripheral territories. Macaronesia archipelagos such as Canarias and Madeira are one fine example. Hawaii and Iceland are other examples of similar territories for their island dispersion and unique healthcare systems.

In this way, a global online survey with closed-ended questions was developed (see Annex I) and Annex II) for Portuguese and English language, respectively) to retrieve data from a multitude of healthcare stakeholders living in the Azores archipelago and provide information about electronic systems in use to access healthcare data in this autonomous region of Portugal (see Figure 21).

Figure 21. Survey characteristics and framework



According to Table 10, the information about the technology acceptance model, barriers to accessing electronic health data, and the utility and importance of selected healthcare data were retrieved using 5-Likert scale questions (with non-applicable

options, excluding the last construct). Dropdown questions were used to collect demographic data detailed in Figure 4.

Table 10. 5-Likert research categories: TAM's questions, barriers to access electronic health data, and healthcare data utility and importance

| Primary category                                      | Secondary category                                                                                                                 | Originally based on                                           |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| TAM's Perceived Usefulness (PU) <sup>a)</sup>         | The electronic system to access healthcare data enables me to accomplish tasks more quickly (PU_1)                                 | Cowen and Kowalczyk (2009)                                    |
|                                                       | The electronic system to access healthcare data has improved my quality of work (PU_2)                                             |                                                               |
|                                                       | The electronic system to access healthcare data makes it easier to do my job (PU_3)                                                |                                                               |
|                                                       | The electronic system to access healthcare data has improved my productivity (PU_4)                                                |                                                               |
|                                                       | The electronic system to access healthcare data gives me greater control over my job (PU_5)                                        |                                                               |
|                                                       | The electronic system to access healthcare data enhances my effectiveness on the job (PU_6)                                        |                                                               |
|                                                       | The electronic system to access healthcare data enables me to access my healthcare status more quickly (PU_1P) <sup>d)</sup>       | Cowen and Kowalczyk (2009)<br><br>(adapted to patients' view) |
|                                                       | The electronic system to access healthcare data has improved the quality of my health (PU_2P) <sup>d)</sup>                        |                                                               |
|                                                       | The electronic system to access healthcare data makes it easier to access my healthcare data (PU_3P) <sup>d)</sup>                 |                                                               |
|                                                       | The electronic system to access healthcare data increased my knowledge about my health status (PU_4P) <sup>d)</sup>                |                                                               |
|                                                       | The electronic system to access healthcare data gives me greater control over my health status (PU_5P) <sup>d)</sup>               |                                                               |
|                                                       | The electronic system to access healthcare data enhances the effectiveness of my healthcare treatments (PU_6P) <sup>d)</sup>       |                                                               |
| TAM's Perceived Ease of Use (PEU) <sup>a)</sup>       | My interaction with the electronic system to access healthcare data has been clear and understandable (PEU_1)                      | Cowen and Kowalczyk (2009)                                    |
|                                                       | Overall, the electronic system to access healthcare data is easy to use (PEU_2)                                                    |                                                               |
|                                                       | Learning to operate the electronic system to access healthcare data was easy for me (PEU_3)                                        |                                                               |
|                                                       | I rarely become confused when I use the electronic system to access healthcare data (PEU_4)                                        |                                                               |
|                                                       | I rarely make errors when using the electronic system to access healthcare data (PEU_5)                                            |                                                               |
|                                                       | I am rarely frustrated when using the electronic system to access healthcare data (PEU_6)                                          |                                                               |
| TAM's Behavioral Intention to Use (BIU) <sup>a)</sup> | I intend to continue using the electronic system to access healthcare data to perform my job (BIU_1)                               | Cowen and Kowalczyk (2009)                                    |
|                                                       | I intend to frequently use the electronic system to access healthcare data to perform my job (BIU_2)                               |                                                               |
|                                                       | I intend to continue using the electronic system to access healthcare data to follow up on my health status (BIU_1P) <sup>d)</sup> |                                                               |

| Primary category                                                                                                                      | Secondary category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Originally based on                                           |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
|                                                                                                                                       | I intend to frequently use the electronic system to access healthcare data to follow up on my health status (BIU_2P) <sup>d)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Cowen and Kowalczyk (2009)<br><br>(adapted to patients' view) |
| TAM's Attitude Toward Using (ATU) <sup>a)</sup>                                                                                       | <p>I think positively about using the electronic system to access healthcare data (ATU_1)</p> <p>The electronic system to access healthcare data is a positive tool for health data management (ATU_2)</p> <p>Using the electronic system to access healthcare data is a good idea (ATU_3)</p> <p>The electronic system to access healthcare data is worth to use for health data management (ATU_4)</p> <p>I plan on using the electronic system to access healthcare data on a regular basis in the future (ATU_5)</p> <p>Using the electronic system to access healthcare data within the management of health data is pleasant (ATU_6)</p> | Chang (2004); Mertins and Austermann (2014)                   |
| TAM's Actual System in Use (ASU) <sup>b)</sup>                                                                                        | <p>How many times do you use the electronic system to access healthcare data during a day? (ASU_1)</p> <p>How many times do you use the electronic system to access healthcare data during a week? (ASU_2)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 | Chang (2004); Mertins and Austermann (2014)                   |
| Perceived Barriers to Healthcare Data Access (PBDA) <sup>a)</sup>                                                                     | Heterogeneity of electronic health records (PBDA_1); data privacy risks (PBDA_2); legal restrictions (PBDA_3); lack of adequate infrastructure (PBDA_4); cybersecurity risks (PBDA_5); lack of technical interoperability (PBDA_6); data quality and reliability (PBDA_7); lack of stakeholders' awareness (PBDA_8); lack of stakeholders' interest (PBDA_9)                                                                                                                                                                                                                                                                                   | European Consumers Organisation (2017)                        |
| Perceived Usefulness and Importance of Healthcare Data: patients' general information (PUD_1; PID_1) <sup>c)</sup>                    | Allergies and intolerances; demography; pregnancy; habits; clinical and family history; identification; death; pathologies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Empirical knowledge                                           |
| Perceived Usefulness and Importance of Healthcare Data: diagnostic and evaluation of patients' health (PUD_2; PID_2) <sup>c)</sup>    | Anthropometric evaluation; laboratory tests; imaging exams; rapid tests; physical exams; electrocardiogram; vital parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Empirical knowledge                                           |
| Perceived Usefulness and Importance of Healthcare Data: prevention and promotion of patients' health (PUD_3; PID_3) <sup>c)</sup>     | Vaccination and immunization; screenings; diet; physical activity; antimicrobial resistance; smoking; epidemiology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Empirical knowledge                                           |
| Perceived Usefulness and Importance of Healthcare Data: patients' treatments (PUD_4; PID_4) <sup>c)</sup>                             | Medicines; pharmaceutical products; pharmaceutical products; medical consumables; laboratory consumables; drug interactions; dosage; technical information about healthcare technologies                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Empirical knowledge                                           |
| Perceived Usefulness and Importance of Healthcare Data: accessibility of patients to healthcare services (PUD_5; PID_5) <sup>c)</sup> | Access to emergency services; access to appointments; access to treatments; access to surgeries                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Empirical knowledge                                           |
| Perceived Usefulness and Importance of Healthcare Data: financial resources spent on healthcare (PUD_6; PID_6) <sup>c)</sup>          | Cost with complementary diagnostic and therapeutic exams; cost with medicines; cost with pharmaceutical products; cost with medical consumables; cost with laboratory consumables; cost with human resources                                                                                                                                                                                                                                                                                                                                                                                                                                   | Empirical knowledge                                           |

| Primary category                                                                                                                                   | Secondary category                                                                                                             | Originally based on |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Perceived Usefulness and Importance of Healthcare Data: temporal resources spent on healthcare (PUD 7; PID 7) <sup>c)</sup>                        | Average time of appointment; average time of treatment; average time of waiting; average time of management and administration | Empirical knowledge |
| a) 5-Likert agreement scale                                                                                                                        |                                                                                                                                |                     |
| b) 5-Likert frequency scale                                                                                                                        |                                                                                                                                |                     |
| c) PUD: Perceived Usefulness of Healthcare Data (5-Likert utility scale); PID: Perceived Importance of Healthcare Data (5-Likert importance scale) |                                                                                                                                |                     |
| d) Related only to patients                                                                                                                        |                                                                                                                                |                     |

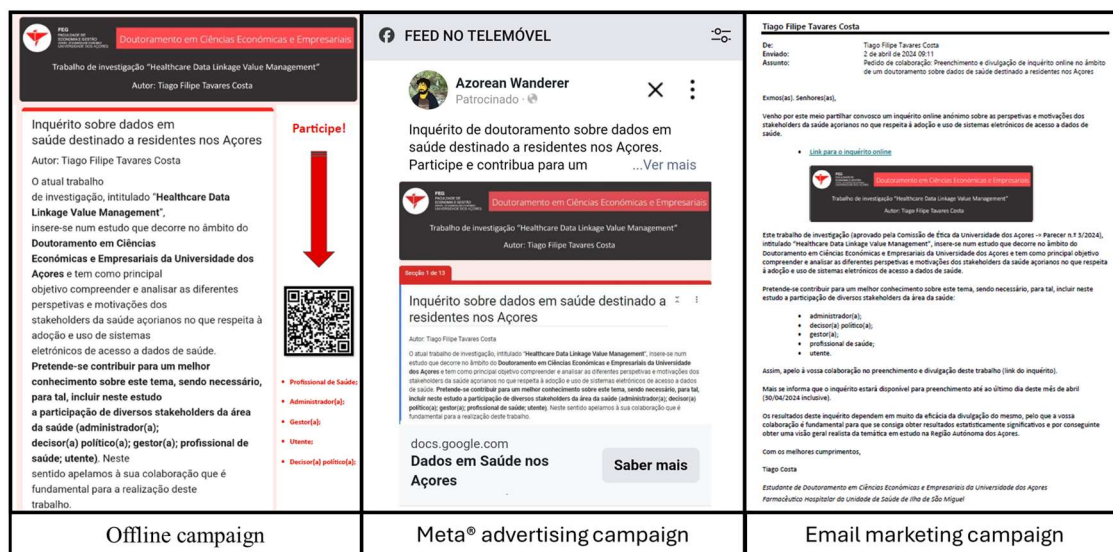
### 3.2.2. Data gathering

Healthcare professionals, patients, administrators, managers, and policymakers could provide their perspectives and data through a Google Forms survey (see Annex I), which was available from 22 January 2024 to 30 April 2024. Before the data collection process, the University of the Azores' Ethics Committee approved, on 16 January 2024, the survey's structure through its deliberation n. ° 3/2024 (approbation conceded under the initial and provisional thesis title "Healthcare Data Linkage Value Management", see Annex III). Moreover, this approval guaranteed the introduction of digital informed consent on the initial page of the Google Forms survey. The stakeholders' consent was mandatory to be accepted by stakeholders (by clicking on the "next" button) so they could initiate answering anonymously the survey.

### 3.2.3. Communication strategy

The communication strategy of the online survey was based on online and offline methods. This mixed strategy (see Figure 22 for examples) was seen as important due to the nine islands of the Azores archipelago. Therefore, electronic dissemination methods of the survey were essential to reach diversified healthcare stakeholders living in the Azores. In this way, email marketing campaigns were used to reach entities associated with healthcare stakeholders. Social media (Meta Platforms, Inc. platforms such as Facebook, Instagram, and WhatsApp) was also used through its organic and paid reach. The paid reach campaign was active from 01 February 2024 to 30 April 2024, and its audience scope was defined as stakeholders who only lived in the Azores archipelago. The offline strategy was based on word of mouth and QRC posters.

Figure 22. Examples of online and offline communication strategies



### 3.2.4. Data extraction and analysis

The information provided by healthcare stakeholders through the Google Forms survey was exported to a CSV file. Using an Excel version of the file (decreased compatibility issues), data was treated through Microsoft Excel, where a codification process that transformed text into numbers was performed, and non-applicable data was removed. This codified information was then imported into IBM SPSS Statistics 29.0, which allowed the use of descriptive analysis, through the Crosstabs tool, the Custom Tables tool, the One-way ANOVA tool, and its Tukey HSD post hoc test. SmartPLS 4.1.0.6 software was used to analyse the constructs' and indicators' relationships, by performing the partial least squares structural equation modeling (PLS-SEM) tool, which allowed the construction of a reflective model for healthcare professionals, patients, and overseeing healthcare stakeholders. These PLS-SEM data were crossed between the three groups of stakeholders to create rankings and characterize electronic systems to access healthcare data within the Azorean healthcare system. Additionally, data results obtained from IBM SPSS Statistics 29.0 and SmartPLS 4.1.0.6 were complemented with a Microsoft Excel analysis.

## CHAPTER IV – RESULTS

### 4.1. Demographic data analysis

#### 4.1.1. Overview of all healthcare stakeholders

According to Table 11, the online survey gathered information from five distinct types of healthcare stakeholders. Patients and healthcare professionals were among the stakeholders with more registered answers, totaling 56.31 % and 36.77% of the total sample, respectively. Administrators, managers, and policymakers represented the remaining 6.92%. The sector where working healthcare stakeholders developed their professional activities was also assessed. The public sector gathered the highest number of responses (79.11%), followed by the private sector with only 18.32%. Only 6 (1.86%) of the working healthcare stakeholders were from the social sector. As expected, all the policymakers' answers were from the public sector. The 18 administrators registered the highest percentage of non-public sector answers, reaching 38.89% of their stakeholder category. Around 70% of stakeholders who filled out the survey were females. Patients, healthcare professionals, and managers provided residual answers that did not disclose their gender information. Policymakers were the only group with a gender ratio favorable to the male gender (72.72% were males). Age distribution among the surveyed stakeholders was heterogeneous. More than 50% were aged between 35 to 54 years old. However, managers were the only stakeholders with the 55 to 64-year-olds registering the highest relative numbers of answers. Patients were the only group that gathered opinions from 18-year-olds or younger stakeholders. On the other hand, managers and policymakers inquiring resulted in null answers from stakeholders above 64 years old. The 19 to 24 age group also did not achieve any results in the administrators, managers, and policymakers. The geographical distribution of results demonstrated that the survey reached all islands and municipalities of the Azores archipelago. Three islands (São Miguel Island, Terceira Island, and Pico Island) registered answers from all stakeholders. Corvo Island was the only one to obtain results from one type of stakeholders, namely patients. São Miguel Island, the most populated island, gathered more than 50% of the opinions from all stakeholders, followed by Terceira Island (second most populated island) with around 19% of replies. Corvo Island, the least populated island, obtained the

lowest number of answers. Ponta Delgada, the main municipality of São Miguel Island, is responsible for 40.16% of the results, while Angra do Heroísmo (Terceira Island) accounts for 14.11%.

Table 11. Healthcare stakeholders' demographic characterization

| Primary information category            | Secondary information category | Type of healthcare stakeholder |         |               |         |             | Total <sup>b)</sup> |        |
|-----------------------------------------|--------------------------------|--------------------------------|---------|---------------|---------|-------------|---------------------|--------|
|                                         |                                | Healthcare professional        | Patient | Administrator | Manager | Policymaker |                     |        |
| Number of surveyed stakeholders         | -                              | 271                            | 415     | 18            | 22      | 11          | 737                 | 100%   |
| Type of healthcare sector <sup>a)</sup> | Public sector                  | 218                            | -       | 11            | 17      | 11          | 257                 | 34.87% |
|                                         | Private sector                 | 49                             | -       | 6             | 4       | 0           | 59                  | 8.01%  |
|                                         | Social sector                  | 4                              | -       | 1             | 1       | 0           | 6                   | 0.81%  |
| Stakeholders' gender                    | Male                           | 60                             | 134     | 5             | 6       | 8           | 213                 | 28.90% |
|                                         | Female                         | 210                            | 278     | 13            | 15      | 3           | 519                 | 70.42% |
|                                         | I prefer not to answer         | 1                              | 2       | 0             | 1       | 0           | 4                   | 0.54%  |
|                                         | Other                          | 0                              | 1       | 0             | 0       | 0           | 1                   | 0.14%  |
| Stakeholders' age groups                | 18 years or under              | 0                              | 3       | 0             | 0       | 0           | 3                   | 0.41%  |
|                                         | 19 to 24 years                 | 5                              | 19      | 0             | 0       | 0           | 24                  | 3.26%  |
|                                         | 25 to 34 years                 | 59                             | 52      | 3             | 2       | 1           | 117                 | 15.88% |
|                                         | 35 to 44 years                 | 108                            | 126     | 6             | 5       | 4           | 249                 | 33.79% |
|                                         | 45 to 54 years                 | 66                             | 111     | 7             | 5       | 4           | 193                 | 26.19% |
|                                         | 55 to 64 years                 | 25                             | 71      | 1             | 10      | 2           | 109                 | 14.79% |
|                                         | 65 years or over               | 8                              | 33      | 1             | 0       | 0           | 42                  | 5.70%  |
| Stakeholders' residence information     | São Miguel Island              | 173                            | 232     | 6             | 13      | 6           | 430                 | 58.34% |
|                                         | Santa Maria Island             | 2                              | 14      | 2             | 0       | 0           | 18                  | 2.44%  |
|                                         | Graciosa Island                | 10                             | 6       | 2             | 0       | 0           | 18                  | 2.44%  |
|                                         | Terceira Island                | 56                             | 72      | 4             | 3       | 2           | 137                 | 18.59% |
|                                         | Flores Island                  | 2                              | 10      | 2             | 0       | 1           | 15                  | 2.04%  |
|                                         | Pico Island                    | 7                              | 23      | 1             | 1       | 2           | 34                  | 4.61%  |
|                                         | Faial Island                   | 14                             | 29      | 1             | 4       | 0           | 48                  | 6.51%  |
|                                         | São Jorge Island               | 7                              | 22      | 0             | 1       | 0           | 30                  | 4.07%  |
|                                         | Corvo Island                   | 0                              | 7       | 0             | 0       | 0           | 7                   | 0.95%  |
|                                         | Municipalities (out of 19)     | 16                             | 19      | 11            | 9       | 6           | -                   | -      |

a) Non-applicable question to patients as this information category is only related to healthcare working classes

b) % values related to the total number of stakeholders (n=737)

Likewise, the same municipalities followed a similar pattern within each type of stakeholder (except for managers as Ribeira Grande and Horta obtained a higher value

than Angra do Heroísmo). Moreover, the survey reached 84.21% and 100% of municipalities for healthcare professionals and patients, respectively. Results from policymakers were only from 31.58% of the total municipalities, which was the lowest value among stakeholders.

#### **4.1.2. Overview of the different healthcare professionals**

The data collected from the survey provided results for 271 healthcare professionals, with nurses being the most representative category (39.11 %), followed by physicians (21.40%), pharmacists (14.02%), and senior diagnostic and therapeutic technicians (11.81%) (see Table 12). Three types of professionals, namely psychologists, senior health technicians, and nutritionists, represented only 13.65% of the healthcare professionals' sample. Most healthcare professionals perform their activities in the public sector. Pharmacists were the only group with more professionals working in the private sector (50%) than in the public (47.37%). Social sector representation in the sample is scarce (1.48%). As for gender categorization, female healthcare workers represent most of the surveyed professionals (77.49%). The age classification revealed that almost all stakeholders (85.98%) are between 25 and 54 years old. Professionals aged between 35 and 55 years are the most representative group. Only physicians and nurses registered professionals above 65 years old. Nurses, senior diagnostic and therapeutic technicians, and senior health technicians have obtained results in the lowest age group. Geographical analysis of the surveyed population showed that 63.84 % live in São Miguel Island and 20.66 % in Terceira Island, which represent the most populated and second most populated islands of the Azores Archipelago, respectively. These two islands are the only ones with answers from all types of healthcare professionals. Ponta Delgada municipality (São Miguel Island) accounts for 46.49% of healthcare professionals surveyed, followed by Angra do Heroísmo (Terceira Island) with 15.13% and Ribeira Grande (São Miguel Island) with 8.49%. Senior diagnostic and therapeutic technicians have the highest number of municipalities with 57,89% of the total possible municipalities. Corvo Island (the least populated) is the only island from the Azores Archipelago that did not achieve any results. The average number of registered municipalities by type of healthcare professionals was 8 municipalities.

Table 12. Healthcare professionals' demographic characterization

| Primary information category        | Secondary information category | Type of healthcare professionals |      |      |      |      |     |      | Total |        |
|-------------------------------------|--------------------------------|----------------------------------|------|------|------|------|-----|------|-------|--------|
|                                     |                                | Phar                             | Phys | Nurs | Sdtt | Psyc | Sht | Nutr |       |        |
| Number of surveyed professionals    | -                              | 38                               | 58   | 106  | 32   | 12   | 15  | 10   | 271   | 100%   |
| Type of healthcare sector           | Public sector                  | 18                               | 44   | 98   | 28   | 10   | 13  | 7    | 218   | 80.44% |
|                                     | Private sector                 | 19                               | 14   | 5    | 4    | 2    | 2   | 3    | 49    | 18.08% |
|                                     | Social sector                  | 1                                | 0    | 3    | 0    | 0    | 0   | 0    | 4     | 1.48%  |
| Stakeholders' gender                | Male                           | 9                                | 17   | 19   | 9    | 3    | 3   | 0    | 60    | 22.14% |
|                                     | Female                         | 29                               | 40   | 87   | 23   | 9    | 12  | 10   | 210   | 77.49% |
|                                     | I prefer not to answer         | 0                                | 1    | 0    | 0    | 0    | 0   | 0    | 1     | 0.37%  |
|                                     | Other                          | 0                                | 0    | 0    | 0    | 0    | 0   | 0    | 0     | 0.00%  |
| Stakeholders' age groups            | 19 to 24 years                 | 0                                | 0    | 1    | 3    | 0    | 1   | 0    | 5     | 1.85%  |
|                                     | 25 to 34 years                 | 12                               | 16   | 11   | 7    | 5    | 4   | 4    | 59    | 21.77% |
|                                     | 35 to 44 years                 | 16                               | 23   | 47   | 8    | 4    | 5   | 5    | 108   | 39.85% |
|                                     | 45 to 54 years                 | 8                                | 8    | 37   | 7    | 3    | 3   | 0    | 66    | 24.35% |
|                                     | 55 to 64 years                 | 2                                | 4    | 9    | 7    | 0    | 2   | 1    | 25    | 9.23%  |
|                                     | 65 years or over               | 0                                | 7    | 1    | 0    | 0    | 0   | 0    | 8     | 2.95%  |
| Stakeholders' residence information | São Miguel Island              | 22                               | 45   | 63   | 21   | 7    | 9   | 6    | 173   | 63.84% |
|                                     | Santa Maria Island             | 1                                | 0    | 0    | 0    | 1    | 0   | 0    | 2     | 0.74%  |
|                                     | Graciosa Island                | 0                                | 0    | 5    | 1    | 1    | 3   | 0    | 10    | 3.69%  |
|                                     | Terceira Island                | 12                               | 10   | 23   | 4    | 3    | 1   | 3    | 56    | 20.66% |
|                                     | Flores Island                  | 0                                | 0    | 0    | 1    | 0    | 0   | 1    | 2     | 0.74%  |
|                                     | Pico Island                    | 1                                | 1    | 1    | 2    | 0    | 2   | 0    | 7     | 2.58%  |
|                                     | Faial Island                   | 1                                | 1    | 10   | 2    | 0    | 0   | 0    | 14    | 5.17%  |
|                                     | São Jorge Island               | 1                                | 1    | 4    | 1    | 0    | 0   | 0    | 7     | 2.58%  |
|                                     | Municipalities (out of 19)     | 8                                | 9    | 10   | 11   | 5    | 5   | 5    | -     | -      |

#### 4.1.3. Overview of patients by age group

The online survey obtained results from 415 patients (see Table 13). The stakeholders were distributed in seven age groups. The age group with the highest representativity was 35 to 44 years old (30.36%), followed by 45 to 54 years old (26.75%). Both these age groups represented more than half of the sample gathered. Patients below 25 years old achieved only 5.30 % whereas those above 54 years old reached 25.06%. As for gender results, about one-third of the respondents were male while the female gender was responsible for the remaining two-thirds. In 6 age groups, the female gender represented more than 60% of the sample. Only the patients above 64 years registered more male

participants than females. The geographical distribution of the sample revealed that patients from all 9 islands of the Azores archipelago completed the survey. São Miguel Island and Terceira Island, the two most populated islands, achieved the highest representativity. More than 50% of the sample was associated with São Miguel Island while Terceira Island only registered 17,35%. The other 7 islands obtained values below 7%. Only one age group gathered answers from all nine islands. The distribution of results within the age groups and corresponding islands was heterogeneous. For example, regarding top results, the age group 35 to 44 years old represented 33.19% of all São Miguel Island results while for Terceira Island the 45 to 54 years old achieved 33.33%. The residency information revealed also that each one of the 19 municipalities of the Azores archipelago registered at least 3 submitted answers. Ponta Delgada registered 157 results (37.83%) followed by Angra do Heroísmo with 55 entries (13.25%).

Table 13. Patients' demographic characterization

| Primary information category        | Secondary information category | Age groups |         |         |         |         |         |      | Total |        |
|-------------------------------------|--------------------------------|------------|---------|---------|---------|---------|---------|------|-------|--------|
|                                     |                                | ≤ 18       | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 |       |        |
| Number of surveyed patients         | -                              | 3          | 19      | 52      | 126     | 111     | 71      | 33   | 415   | 100%   |
| Stakeholders' gender                | Male                           | 1          | 1       | 16      | 47      | 24      | 26      | 19   | 134   | 32.29% |
|                                     | Female                         | 2          | 17      | 36      | 79      | 85      | 45      | 14   | 278   | 66.99% |
|                                     | I prefer not to answer         | 0          | 1       | 0       | 0       | 1       | 0       | 0    | 2     | 0.48%  |
|                                     | Other                          | 0          | 0       | 0       | 0       | 1       | 0       | 0    | 1     | 0.24%  |
| Stakeholders' residence information | São Miguel Island              | 3          | 13      | 27      | 77      | 51      | 42      | 19   | 232   | 55.90% |
|                                     | Santa Maria Island             | 0          | 1       | 3       | 4       | 4       | 2       | 0    | 14    | 3.37%  |
|                                     | Graciosa Island                | 0          | 1       | 2       | 0       | 2       | 1       | 0    | 6     | 1.45%  |
|                                     | Terceira Island                | 0          | 3       | 7       | 20      | 24      | 10      | 8    | 72    | 17.35% |
|                                     | Flores Island                  | 0          | 1       | 2       | 3       | 0       | 3       | 1    | 10    | 2.41%  |
|                                     | Pico Island                    | 0          | 0       | 3       | 6       | 10      | 3       | 1    | 23    | 5.54%  |
|                                     | Faial Island                   | 0          | 0       | 1       | 6       | 11      | 7       | 4    | 29    | 6.99%  |
|                                     | São Jorge Island               | 0          | 0       | 5       | 7       | 7       | 3       | 0    | 22    | 5.30%  |
|                                     | Corvo Island                   | 0          | 0       | 2       | 3       | 2       | 0       | 0    | 7     | 1.69%  |
|                                     | Municipalities (out of 19)     | 2          | 9       | 16      | 16      | 16      | 16      | 9    | -     | -      |

The remaining municipalities obtained individual values below 10%. As for the age group distribution among the municipalities, none achieved consecutive results in all 19 municipalities. Four age groups between 25 and 64 years old reached 84.21% of the

municipalities. The 19 to 24 year old and above 64 years old groups reached only 47.37% while patients below 19 years old were present only in two different municipalities.

## **4.2. TAM-oriented perspectives about electronic systems in use to access healthcare data**

The following survey introductory questions were created to retrieve healthcare stakeholders' opinions about the technology acceptance model: (1) Regarding your perception of the utility (PU) / ease of use (PEU) of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your agreement degree with the following sentences; (2) Regarding your intention (BIU) / attitude towards (ATU) to use electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your agreement degree with the following sentences; and (3) Regarding your actual frequency (ASU) of use of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select the frequency level of use most adequate for you.

### **4.2.1. All healthcare stakeholders' analysis**

The adherence of healthcare stakeholders to the questions about the technology acceptance model revealed that they provided a high number of responses to the constructs with non-applicable options (see Annex IV). However, patients diminished intensively their average response rate (86.31%) in PEU while policymakers obtained their lowest average value (59.09%) in BIU. PU and PEU analysis revealed that patients and policymakers view, on average, the IT system as less useful than other stakeholders. Policymakers obtained the highest average standard deviation (see Annex IV), meaning there was a high level of mixed opinions. More than 70% of healthcare professionals, administrators, and managers agreed or totally agreed that the system is useful (see Annex V). However, for PEU, administrators are the only group of stakeholders who achieved 70% of responses between agreed or totally agreed (see Annex V), meaning the IT systems are more useful than easy to use. BIU and ATU are the constructs that presented more average positive opinions about the electronic system to access healthcare data. In BIU, around 90% of healthcare professionals and managers agreed or totally agreed with

the statements (see Annex V). Patients appear to have weaker intentions to use the system, as only 65.12% agreed or totally agreed with the overall construct's statements. As for ATU, about 86% of healthcare professionals, managers, and administrators agreed or totally agreed with having positive attitudes toward IT systems. As for using electronic systems to access healthcare data (ASU), healthcare professionals declared that they used more (around 80% use frequently or very frequently) than the other stakeholders. On the other hand, according to Annex V, around 68% of patients and 81% of policymakers affirmed that they rarely or never have used IT systems to access, making them as the stakeholders less engaged with this type of system.

The one-way ANOVA tool produced statistically significant results on three constructs (PEU, ATU, and ASU) shared by all 5 stakeholders. PU and BI data were not included in the analysis between patients and the other stakeholders as they measured different statements. According to Table 14, PEU\_1 (p-value: 0.001; F: 4.864), PEU\_3 (p-value: 0.003; F: 3.984) and PEU\_6 (p-value: 0.016; F: 3.069) were the meaningful categories. As for ATU, the only non-significant results were obtained on ATU\_1 (p-value: 0.373; F: 1.064) and ATU\_6 (p-value: 0.786; F: 0.431). ASU\_1 (p-value: 0.000; F: 159.594), and ASU\_2 (p-value: 0.000; F: 189.015) achieved meaningful results. According to the post hoc test, the ANOVA statistically significant results in PEU and ATU are based on the differences between patients and healthcare professionals, meaning these two stakeholders diverge in their attitudes towards the IT system and its user-friendly aspects. As for the real use of the system (ASU), healthcare professionals diverged with all stakeholders. Patients differed with all stakeholders except policymakers while managers' opinions contrasted with those of healthcare professionals, patients, and policymakers.

Table 14. Healthcare stakeholders' perspectives about TAM's constructs: average and one-way ANOVA results

| Primary information category            | Secondary information category | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|-----------------------------------------|--------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                                         |                                | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
| Perceived Usefulness (PU) <sup>a)</sup> | PU_1                           | 3.83 | -    | 3.94 | 4.00 | 3.70 | 3.87      | 0.891         | 0.208         |
|                                         | PU_1P                          | -    | 3.44 | -    | -    | -    | 3.44      | -             | -             |
|                                         | PU_2                           | 3.93 | -    | 3.76 | 4.05 | 2.88 | 3.66      | 0.103         | 2.078         |

| Primary information category                    | Secondary information category | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|-------------------------------------------------|--------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                                                 |                                | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
|                                                 | PU_2P                          | -    | 2.98 | -    | -    | -    | 2.98      | -             | -             |
|                                                 | PU_3                           | 3.95 | -    | 3.94 | 4.20 | 3.25 | 3.84      | 0.305         | 1.213         |
|                                                 | PU_3P                          | -    | 3.43 | -    | -    | -    | 3.43      | -             | -             |
|                                                 | PU_4                           | 3.47 | -    | 3.82 | 3.79 | 2.63 | 3.43      | 0.144         | 1.817         |
|                                                 | PU_4P                          | -    | 3.24 | -    | -    | -    | 3.24      | -             | -             |
|                                                 | PU_5                           | 3.82 | -    | 3.78 | 3.84 | 3.13 | 3.64      | 0.435         | 0.913         |
|                                                 | PU_5P                          | -    | 3.24 | -    | -    | -    | 3.24      | -             | -             |
|                                                 | PU_6                           | 3.65 | -    | 3.78 | 4.10 | 3.13 | 3.66      | 0.272         | 1.306         |
|                                                 | PU_6P                          | -    | 3.30 | -    | -    | -    | 3.30      | -             | -             |
| $\bar{X}$                                       |                                | 3.78 | 3.27 | 3.84 | 4.00 | 3.12 | -         | -             | -             |
| Perceived Ease of Use (PEU) <sup>a)</sup>       | PEU_1                          | 3.54 | 3.15 | 3.67 | 3.65 | 3.30 | 3.46      | 0.001         | 4.864         |
|                                                 | PEU_2                          | 3.34 | 3.13 | 3.59 | 3.30 | 3.20 | 3.31      | 0.193         | 1.527         |
|                                                 | PEU_3                          | 3.54 | 3.17 | 3.56 | 3.60 | 3.10 | 3.39      | 0.003         | 3.984         |
|                                                 | PEU_4                          | 3.34 | 3.19 | 3.50 | 3.32 | 2.70 | 3.21      | 0.258         | 1.329         |
|                                                 | PEU_5                          | 3.38 | 3.15 | 3.35 | 3.21 | 3.00 | 3.22      | 0.193         | 1.527         |
|                                                 | PEU_6                          | 2.70 | 3.05 | 3.06 | 2.89 | 2.60 | 2.86      | 0.016         | 3.069         |
| $\bar{X}$                                       |                                | 3.31 | 3.14 | 3.45 | 3.33 | 2.98 | -         | -             | -             |
| Behavioral Intention to Use (BIU) <sup>a)</sup> | BIU_1                          | 4.25 | -    | 4.00 | 4.32 | 3.83 | 4.10      | 0.980         | 0.403         |
|                                                 | BIU_1P                         | -    | 3.67 | -    | -    | -    | 3.67      | -             | -             |
|                                                 | BIU_1                          | 4.32 | -    | 3.89 | 4.30 | 3.86 | 4.09      | 1.930         | 0.125         |
|                                                 | BIU_2P                         | -    | 3.65 | -    | -    | -    | 3.65      | -             | -             |
| $\bar{X}$                                       |                                | 4.29 | 3.66 | 3.94 | 4.31 | 3.85 | -         | -             | -             |
| Attitude Toward Using (ATU) <sup>a)</sup>       | ATU_1                          | 3.86 | 3.78 | 3.94 | 4.19 | 3.89 | 3.93      | 0.373         | 1.064         |
|                                                 | ATU_2                          | 4.23 | 3.93 | 4.06 | 4.05 | 4.18 | 4.09      | 0.006         | 3.608         |
|                                                 | ATU_3                          | 4.42 | 4.09 | 4.22 | 4.38 | 4.55 | 4.33      | 0.000         | 6.397         |
|                                                 | ATU_4                          | 4.35 | 3.90 | 4.17 | 4.10 | 4.45 | 4.19      | 0.000         | 8.830         |
|                                                 | ATU_5                          | 4.31 | 3.87 | 3.88 | 4.43 | 4.20 | 4.14      | 0.000         | 8.559         |
|                                                 | ATU_6                          | 3.72 | 3.72 | 3.69 | 4.05 | 3.60 | 3.76      | 0.786         | 0.431         |
| $\bar{X}$                                       |                                | 4.15 | 3.88 | 3.99 | 4.20 | 4.15 | -         | -             | -             |
| Actual System in Use (ASU) <sup>b)</sup>        | ASU_1                          | 4.21 | 2.16 | 3.11 | 3.50 | 1.91 | 2.98      | 0.000         | 159.594       |
|                                                 | ASU_2                          | 4.30 | 2.12 | 3.00 | 3.55 | 1.91 | 2.97      | 0.000         | 189.015       |
| $\bar{X}$                                       |                                | 4.25 | 2.14 | 3.06 | 3.52 | 1.91 | -         | -             | -             |

a) 5-Likert agreement scale: 1 - Totally disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Totally agree

b) 5-Likert frequency scale: 1 - Never; 2 - Rarely; 3 - Occasionally; 4 - Frequently; 5 - Very frequently

#### 4.2.2. Healthcare professionals analysis

According to Annex VI, TAM's survey questions were considered applicable by most of this type of stakeholders. On average, 265 healthcare professionals (97.79%) answered all TAM's questions. The Perceived Usefulness dimension revealed that on average the senior diagnostic and therapeutic technicians agreed more (85.85% agreed or totally agreed, see Annex VII) that the electronic system to access healthcare data that they used was considered a useful tool, while nurses saw their electronic platform as the least useful among the survey population. Also, the senior diagnostic and therapeutic technicians and senior health technicians had a more homogenous opinion than the other healthcare professionals due to their lower average standard deviation values (see Annex VI). For the Perceived Ease of Use dimension, the physicians were the group of professionals that, on average, perceived the electronic system to access healthcare data that they use as more difficult to use compared to other professionals (47.13 % totally disagreed or disagreed, see Annex VII). On the other hand, pharmacists and senior health technicians viewed, on average, as an easier system to operate ( $\pm 67\%$  agreed or totally agreed, see Annex VII). The Behavioral Intention to Use construct revealed homogeneous results between all healthcare stakeholders, with 92.63% agreeing or totally agreeing on their intention on the use of their electronic system to access healthcare data (see Annex VII). Regarding the Attitude Toward Using category, physicians perceived, on average, their electronic system as less positive than other healthcare professionals (16.09% disagree or totally disagree). However, their answers were less homogenous due to their higher average standard deviation (mostly due to results from ATU\_1 and ATU\_6). For the final construct, the Actual System in Use, pharmacists were the healthcare workers who are less using their system (only 59.21% use frequently or very frequently, according to Annex VII). The registered standard deviation for pharmacists, psychologists and nutritionists revealed a heterogenous type of use of their system within their categories. The one-way ANOVA analysis of TAM's constructs provided statistically significant results (Table 15). Three of the constructs (Perceived Ease of Use, Attitude Toward Using, and Actual System in Use) registered p-values inferior to 0.05, meaning that some of their mean values differ among healthcare professionals. The PEU\_1 (p-value: 0.005; F: 3.181) and PEU\_6 (p-value: 0.012; F: 2.810) revealed that healthcare professionals, on average, have different opinions regarding their understanding of their systems and the

frustration felt. A more detailed analysis showed that this difference results from distinct perspectives of physicians with pharmacists and senior diagnostic and therapeutic technicians. The ATU\_1 (p-value: 0.028; F: 2.402), ATU\_2 (p-value: 0.024; F: 2.480) and ATU\_6 (p-value: 0.005; F: 3.198) revealed that healthcare professionals differ in their views about the level of positivity and pleasure experienced when using their informatics systems. Again, this diversion resulted from the viewpoints of physicians, pharmacists, and senior diagnostic and therapeutic technicians. As for the use of their system to access health data, ASU\_1 (p-value: 0.001; F: 3.823) and ASU\_2 (p-value: 0.002; F: 3.650) disclosed that both the daily and weekly use of informatic systems differ among the type of professionals, namely between pharmacists and, physicians, nurses and senior diagnostic and therapeutic technicians.

Table 15. Healthcare professionals' perspectives about TAM's constructs: average and one-way ANOVA results

| Primary information category                    | Secondary information category | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|-------------------------------------------------|--------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                                                 |                                | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
| Perceived Usefulness (PU) <sup>a)</sup>         | PU_1                           | 4.20 | 3.71 | 3.61 | 4.31 | 3.91 | 4.00 | 3.80 | 3.93      | 0.054         | 2.101         |
|                                                 | PU_2                           | 3.94 | 3.98 | 3.76 | 4.25 | 4.09 | 4.07 | 3.90 | 4.00      | 0.571         | 0.799         |
|                                                 | PU_3                           | 4.14 | 3.98 | 3.76 | 4.32 | 3.73 | 4.20 | 3.90 | 4.00      | 0.269         | 1.276         |
|                                                 | PU_4                           | 3.77 | 3.41 | 3.29 | 3.84 | 3.20 | 3.50 | 3.60 | 3.52      | 0.352         | 1.119         |
|                                                 | PU_5                           | 3.64 | 3.86 | 3.70 | 4.23 | 3.73 | 4.14 | 4.00 | 3.90      | 0.317         | 1.180         |
|                                                 | PU_6                           | 3.78 | 3.76 | 3.45 | 3.97 | 3.64 | 3.79 | 3.50 | 3.70      | 0.501         | 0.892         |
|                                                 | $\bar{X}$                      | 3.91 | 3.78 | 3.59 | 4.15 | 3.72 | 3.95 | 3.78 | -         | -             | -             |
| Perceived Ease of Use (PEU) <sup>a)</sup>       | PEU_1                          | 3.58 | 3.05 | 3.58 | 4.03 | 3.82 | 3.73 | 3.78 | 3.65      | 0.005         | 3.181         |
|                                                 | PEU_2                          | 3.74 | 2.98 | 3.30 | 3.41 | 3.55 | 3.73 | 3.56 | 3.47      | 0.075         | 1.938         |
|                                                 | PEU_3                          | 3.80 | 3.50 | 3.45 | 3.66 | 3.18 | 3.87 | 3.22 | 3.53      | 0.421         | 1.007         |
|                                                 | PEU_4                          | 3.37 | 2.98 | 3.40 | 3.69 | 3.36 | 3.60 | 3.22 | 3.38      | 0.147         | 1.603         |
|                                                 | PEU_5                          | 3.43 | 3.03 | 3.45 | 3.69 | 3.18 | 3.71 | 3.33 | 3.40      | 0.111         | 1.745         |
|                                                 | PEU_6                          | 3.09 | 2.24 | 2.70 | 3.06 | 2.27 | 3.07 | 2.67 | 2.73      | 0.012         | 2.810         |
|                                                 | $\bar{X}$                      | 3.50 | 2.97 | 3.31 | 3.59 | 3.23 | 3.62 | 3.30 | -         | -             | -             |
| Behavioral Intention to Use (BIU) <sup>a)</sup> | BIU_1                          | 4.26 | 4.21 | 4.18 | 4.44 | 4.45 | 4.36 | 4.33 | 4.32      | 0.767         | 0.554         |
|                                                 | BIU_2                          | 4.26 | 4.22 | 4.38 | 4.34 | 4.45 | 4.36 | 4.22 | 4.32      | 0.933         | 0.307         |
|                                                 | $\bar{X}$                      | 4.26 | 4.22 | 4.28 | 4.39 | 4.45 | 4.36 | 4.28 | -         | -             | -             |
| Attitude Toward Using (ATU) <sup>a)</sup>       | ATU_1                          | 4.11 | 3.48 | 3.87 | 4.16 | 4.00 | 3.93 | 3.90 | 3.92      | 0.028         | 2.402         |
|                                                 | ATU_2                          | 4.41 | 3.98 | 4.19 | 4.63 | 4.00 | 4.27 | 4.40 | 4.27      | 0.024         | 2.480         |
|                                                 | ATU_3                          | 4.51 | 4.34 | 4.37 | 4.53 | 4.33 | 4.53 | 4.60 | 4.46      | 0.690         | 0.651         |

| Primary information category             | Secondary information category | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------------------|--------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                                          |                                | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
|                                          | ATU_4                          | 4.39 | 4.10 | 4.37 | 4.63 | 4.36 | 4.53 | 4.40 | 4.40      | 0.080         | 1.908         |
|                                          | ATU_5                          | 4.46 | 4.14 | 4.28 | 4.47 | 4.33 | 4.46 | 4.22 | 4.34      | 0.423         | 1.005         |
|                                          | ATU_6                          | 4.11 | 3.28 | 3.71 | 4.09 | 3.36 | 4.13 | 3.67 | 3.77      | 0.005         | 3.198         |
|                                          | $\bar{X}$                      | 4.33 | 3.89 | 4.13 | 4.42 | 4.07 | 4.31 | 4.20 | -         | -             | -             |
|                                          | ASU_1                          | 3.47 | 4.43 | 4.35 | 4.34 | 4.08 | 4.27 | 3.90 | 4.12      | 0.001         | 3.823         |
| Actual System in Use (ASU) <sup>b)</sup> | ASU_2                          | 3.63 | 4.53 | 4.41 | 4.47 | 4.08 | 4.40 | 3.90 | 4.20      | 0.002         | 3.650         |
|                                          | $\bar{X}$                      | 3.55 | 4.48 | 4.38 | 4.41 | 4.08 | 4.33 | 3.90 | -         | -             | -             |

a) 5-Likert agreement scale: 1 - Totally disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Totally agree

b) 5-Likert frequency scale: 1 - Never; 2 - Rarely; 3 - Occasionally; 4 - Frequently; 5 - Very frequently

### 4.2.3. Patients by age group analysis

The technology acceptance model results (Annex VIII) showed that patients provided a heterogeneous number of answers for each one of the constructs. PU and ATU obtained the highest number of applicable answers, reaching 94.22% of the 415 surveyed patients. BIU registered an answer score of 93.13% while PEU received the lowest score, with only 86.31% of the patients selecting a valid option. As ASU did not have a non-applicable option, all 415 patients provided a valid answer. On average, patients viewed the IT system they used as slightly useful (Table 16). Patients below 19 years old agreed 100% that the system is useful, followed by the oldest age group with 56.45% of them, on average, agreeing or totally agreeing with its usefulness (see Annex IX). The characteristic that patients viewed on average more positively (67.09% agreed or totally agreed, see Annex IX) was the quickness to access healthcare data (PU\_1P). The Perceived Ease of Use data showed mixed positive and negative feelings, with about 30% of patients disagreeing or totally disagreeing with the IT ease of use, while around 40% agreed or totally agreed that the system is easy to use. Higher agreeability was achieved by the age groups between 19 and 24 and 45 to 54 with more than 50% agreeing or totally agreeing with PEU statements (Annex IX). The opinions were, on average, homogeneous through the different PEU statements. The Behavioral Intention to Use construct revealed a more positive opinion among patients when compared to the previous two previous constructs. The age groups between 25 to 44 appeared to share a more positive opinion on average (around 70% agreed or totally agreed, see Annex IX). The most positive

feedback was related to the ATU construct. On average, around 70% of patients agreed or totally agreed about having a positive attitude towards using the electronic system to access healthcare data (Annex IX). There was also homogeneity between almost all age groups, except among the younger patients (below 25 years old), who registered less favorable opinions. For the last construct, the Actual System in Use, average opinions from patients showed a very low level of use, with between 34% to 37% never using the IT system to access healthcare data in a day or a week and around 33% only rarely using it (see Annex IX). About 70% of patients aged above 54 reported never or rarely using a system to access healthcare data, making them the least active age group in this type of systems.

The one-way ANOVA results on Table 16 showed no significant differences between patients' age groups at a 5% significance. The lowest p-value registered was 0.217 (ATU\_3). These results suggest that age does not significantly affect the acceptance of electronic systems to access healthcare data by patients.

Table 16. Patients' perspectives by age group about TAM's constructs: average and one-way ANOVA results

| Primary information category                    | Secondary information category | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|-------------------------------------------------|--------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                                                 |                                | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
| Perceived Usefulness (PU) <sup>a)</sup>         | PU_1P                          | 4.00 | 3.47    | 3.37    | 3.38    | 3.40    | 3.52    | 3.69 | 3.55      | 0.919         | 0.334         |
|                                                 | PU_2P                          | 4.00 | 3.16    | 2.90    | 3.02    | 2.92    | 2.81    | 3.31 | 3.16      | 0.537         | 0.844         |
|                                                 | PU_3P                          | 4.00 | 3.22    | 3.29    | 3.46    | 3.49    | 3.28    | 3.71 | 3.49      | 0.766         | 0.555         |
|                                                 | PU_4P                          | 4.00 | 3.32    | 3.32    | 3.17    | 3.21    | 3.16    | 3.62 | 3.40      | 0.721         | 0.612         |
|                                                 | PU_5P                          | 4.00 | 3.42    | 3.36    | 3.23    | 3.23    | 3.05    | 3.44 | 3.39      | 0.786         | 0.530         |
|                                                 | PU_6P                          | 4.00 | 3.21    | 3.26    | 3.18    | 3.37    | 3.29    | 3.61 | 3.42      | 0.777         | 0.541         |
|                                                 | $\bar{X}$                      | 4.00 | 3.30    | 3.25    | 3.24    | 3.27    | 3.18    | 3.56 | -         | -             | -             |
| Perceived Ease of Use (PEU) <sup>a)</sup>       | PEU_1                          | 2.50 | 3.11    | 3.18    | 3.17    | 3.23    | 2.89    | 3.33 | 3.06      | 0.659         | 0.688         |
|                                                 | PEU_2                          | 3.50 | 3.00    | 3.29    | 3.23    | 3.18    | 2.79    | 3.04 | 3.15      | 0.396         | 1.045         |
|                                                 | PEU_3                          | 2.50 | 3.44    | 3.25    | 3.15    | 3.29    | 2.92    | 3.12 | 3.09      | 0.578         | 0.790         |
|                                                 | PEU_4                          | 3.50 | 3.28    | 3.15    | 3.17    | 3.22    | 3.08    | 3.31 | 3.25      | 0.987         | 0.158         |
|                                                 | PEU_5                          | 2.50 | 3.56    | 3.15    | 3.18    | 3.15    | 3.02    | 3.12 | 3.10      | 0.800         | 0.511         |
|                                                 | PEU_6                          | 3.50 | 3.22    | 3.06    | 3.09    | 3.01    | 2.82    | 3.32 | 3.15      | 0.743         | 0.584         |
|                                                 | $\bar{X}$                      | 3.00 | 3.27    | 3.18    | 3.17    | 3.18    | 2.92    | 3.21 | -         | -             | -             |
| Behavioral Intention to Use (BIU) <sup>a)</sup> | BIU_1P                         | 2.50 | 3.67    | 3.68    | 3.79    | 3.69    | 3.55    | 3.43 | 3.47      | 0.579         | 0.789         |
|                                                 | BIU_2P                         | 2.50 | 3.65    | 3.69    | 3.73    | 3.70    | 3.51    | 3.43 | 3.46      | 0.637         | 0.715         |

| Primary information category              | Secondary information category | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|-------------------------------------------|--------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                                           |                                | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
|                                           | $\bar{X}$                      | 2.50 | 3.66    | 3.69    | 3.76    | 3.70    | 3.53    | 3.43 | -         | -             | -             |
| Attitude Toward Using (ATU) <sup>a)</sup> | ATU_1                          | 3.50 | 3.42    | 3.80    | 3.79    | 3.85    | 3.71    | 3.86 | 3.70      | 0.741         | 0.586         |
|                                           | ATU_2                          | 3.50 | 3.74    | 3.94    | 4.00    | 3.95    | 3.88    | 3.86 | 3.84      | 0.940         | 0.292         |
|                                           | ATU_3                          | 3.50 | 3.53    | 4.10    | 4.16    | 4.12    | 4.07    | 4.07 | 3.94      | 0.217         | 1.390         |
|                                           | ATU_4                          | 3.33 | 3.68    | 4.00    | 3.99    | 3.80    | 3.88    | 3.93 | 3.80      | 0.728         | 0.603         |
|                                           | ATU_5                          | 3.50 | 3.53    | 3.92    | 4.03    | 3.85    | 3.72    | 3.79 | 3.76      | 0.431         | 0.991         |
|                                           | ATU_6                          | 3.33 | 3.61    | 3.94    | 3.76    | 3.68    | 3.56    | 3.79 | 3.67      | 0.647         | 0.704         |
|                                           | $\bar{X}$                      | 3.44 | 3.58    | 3.95    | 3.95    | 3.88    | 3.80    | 3.88 | -         | -             | -             |
| Actual System in Use (ASU) <sup>b)</sup>  | ASU_1                          | 2.00 | 2.53    | 2.19    | 2.12    | 2.23    | 2.10    | 1.97 | 2.16      | 0.562         | 0.811         |
|                                           | ASU_2                          | 2.00 | 2.05    | 2.29    | 2.12    | 2.18    | 2.04    | 1.82 | 2.07      | 0.438         | 0.980         |
|                                           | $\bar{X}$                      | 2.00 | 2.29    | 2.24    | 2.12    | 2.20    | 2.07    | 1.89 | -         | -             | -             |

a) 5-Likert agreement scale: 1 - Totally disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Totally agree

b) 5-Likert frequency scale: 1 - Never; 2 - Rarely; 3 - Occasionally; 4 - Frequently; 5 - Very frequently

### 4.3. Perspectives about barriers preventing electronic access to health data

The opinion of healthcare stakeholders about barriers impeding the access of electronic healthcare data was retrieved by formulating the following question: “Regarding the barriers preventing electronic access to health data in the Autonomous Region of the Azores, please select your agreement degree with the existence or not of the following barriers”.

#### 4.3.1. All healthcare stakeholders analysis

Healthcare stakeholders’ opinions on barriers affecting healthcare data access are shown in Table 17. According to it, healthcare professionals, administrators, and managers obtained higher averages about the general awareness of barriers (more than 65% agreed or totally agreed, see Annex X. The isolated analysis of barriers revealed that the heterogeneity of electronic health records, lack of adequate infrastructure, and lack of technical interoperability are among the ones getting higher average scores. However, according to Annex X, only in PBDA\_4 and PBDA\_6 did 70% of the stakeholders agreed or totally agreed with their existence. Higher average values (above 4) were also achieved by policymakers on PBDA\_1, managers on PBDA\_6, and administrators on PBDA\_5

and PBDA\_6. Average values below 3 were encountered on managers' and policymakers' opinions on PBDA\_3 and PBDA\_7, respectively.

The significance of the difference between the different barriers was statistically assessed. PBDA\_1 (p-value: 0.000; F: 14.183), PBDA\_4 (p-value: 0.001; F: 4.830), PBDA\_5 (p-value: 0.020; F: 2.939), and PBDA\_6 (p-value: 0.000; F: 11.384) produced significant results at a significance level of 5%. These results demonstrated the existence of different views on barriers associated with the heterogeneity of electronic health records, lack of technical interoperability, cybersecurity risks, and lack of adequate infrastructure. According to the Tukey HSD analysis, Patients and healthcare professionals presented different views on the heterogeneity of electronic health records, lack of technical interoperability, and lack of adequate infrastructure. Patients also diverged with managers regarding the lack of technical interoperability. Cybersecurity risks did not obtain any significant result in the post hoc analysis. The lowest post hoc p-value reported was 0.096 and it was related to administrators and policymakers.

Table 17. Healthcare stakeholders' perspectives about barriers preventing electronic access to health data: average, standard deviation, and one-way ANOVA results

| Barriers preventing electronic access to health data <sup>a)</sup> | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value | Standard deviation |      |      |      |      |           |
|--------------------------------------------------------------------|------|------|------|------|------|-----------|---------------|---------------|--------------------|------|------|------|------|-----------|
|                                                                    | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ |
| PBDA_1                                                             | 3.84 | 3.29 | 3.78 | 3.50 | 4.00 | 3.68      | 0.000         | 14.183        | 1.01               | 0.96 | 0.81 | 1.10 | 0.63 | 0.90      |
| PBDA_2                                                             | 3.46 | 3.27 | 3.56 | 3.64 | 3.00 | 3.38      | 0.078         | 2.107         | 1.13               | 1.06 | 1.04 | 1.14 | 1.34 | 1.14      |
| PBDA_3                                                             | 3.34 | 3.29 | 3.50 | 2.95 | 3.18 | 3.25      | 0.449         | 0.924         | 1.02               | 1.02 | 1.15 | 1.25 | 1.66 | 1.22      |
| PBDA_4                                                             | 3.82 | 3.47 | 3.94 | 3.55 | 3.64 | 3.68      | 0.001         | 4.830         | 1.07               | 1.05 | 0.54 | 1.30 | 1.63 | 1.12      |
| PBDA_5                                                             | 3.61 | 3.46 | 4.00 | 3.82 | 3.00 | 3.58      | 0.020         | 2.939         | 1.03               | 1.06 | 0.84 | 1.14 | 1.67 | 1.15      |
| PBDA_6                                                             | 3.96 | 3.45 | 4.11 | 4.09 | 3.64 | 3.85      | 0.000         | 11.384        | 1.00               | 1.06 | 0.96 | 1.23 | 1.21 | 1.09      |
| PBDA_7                                                             | 3.23 | 3.23 | 3.39 | 3.55 | 2.36 | 3.15      | 0.062         | 2.249         | 1.15               | 1.06 | 1.04 | 1.18 | 1.21 | 1.13      |
| PBDA_8                                                             | 3.61 | 3.51 | 3.50 | 3.55 | 3.55 | 3.54      | 0.833         | 0.366         | 1.02               | 1.05 | 1.04 | 1.22 | 1.37 | 1.14      |
| PBDA_9                                                             | 3.42 | 3.33 | 3.17 | 3.36 | 3.45 | 3.35      | 0.759         | 0.468         | 1.10               | 1.06 | 1.15 | 1.18 | 1.29 | 1.16      |
| $\bar{X}$                                                          | 3.59 | 3.37 | 3.66 | 3.56 | 3.31 | -         | -             | -             | 1.06               | 1.04 | 0.95 | 1.19 | 1.33 | -         |

a) 5-Likert agreement scale: 1 - Totally disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Totally agree

### 4.3.2. Healthcare professionals analysis

According to Table 18, healthcare professionals' perspectives about barriers preventing electronic access to health data demonstrated that on average, they slightly agreed or do not have a concrete opinion about them. Pharmacists, physicians, and nurses possessed a slightly higher average than the other professionals and between 60% to 70% agreed or totally agreed, on average, with the existence of barriers (Annex XII). The PBDA\_1, PBDA\_4, PBDA\_5, PBDA\_6, and PBDA\_8 were perceived as impacting electronic access to health data as 65% to 70% of surveyed healthcare professionals agreed or totally agreed with their existence (Annex XII). Data quality and reliability (PBDA\_7) was viewed as the less impactful barrier in the access to health data as 35.83% of the surveyed population disagreed or totally disagreed with it as an effective barrier (Annex XII). As for standard deviation values (see Annex XI), the highest average values were achieved by PBDA\_2 and PBDA\_7, while nutritionists registered the highest average value among the different types of professionals.

Table 18. Healthcare professionals' perspectives about barriers preventing electronic access to health data: average and one-way ANOVA results

| Barriers preventing electronic access to health data <sup>a)</sup> | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|--------------------------------------------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                                                                    | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
| PBDA_1                                                             | 3.79 | 4.16 | 3.84 | 3.75 | 3.42 | 2.93 | 4.30 | 3.74      | 0.001         | 3.995         |
| PBDA_2                                                             | 3.50 | 3.34 | 3.52 | 3.47 | 3.75 | 3.53 | 2.90 | 3.43      | 0.648         | 0.702         |
| PBDA_3                                                             | 3.53 | 3.28 | 3.39 | 3.38 | 3.17 | 3.00 | 3.10 | 3.26      | 0.637         | 0.717         |
| PBDA_4                                                             | 3.66 | 4.14 | 3.86 | 3.75 | 3.50 | 3.13 | 3.70 | 3.68      | 0.031         | 2.360         |
| PBDA_5                                                             | 3.68 | 3.47 | 3.67 | 3.75 | 3.33 | 3.80 | 3.20 | 3.56      | 0.511         | 0.879         |
| PBDA_6                                                             | 3.95 | 4.24 | 4.01 | 3.88 | 3.67 | 3.20 | 3.60 | 3.79      | 0.013         | 2.759         |
| PBDA_7                                                             | 3.63 | 3.19 | 3.22 | 3.00 | 3.00 | 3.20 | 3.00 | 3.18      | 0.333         | 1.151         |
| PBDA_8                                                             | 3.74 | 3.59 | 3.49 | 3.72 | 4.00 | 3.67 | 3.60 | 3.69      | 0.652         | 0.697         |
| PBDA_9                                                             | 3.37 | 3.48 | 3.42 | 3.28 | 3.67 | 3.47 | 3.30 | 3.43      | 0.958         | 0.252         |
| $\bar{X}$                                                          | 3.65 | 3.65 | 3.60 | 3.55 | 3.50 | 3.33 | 3.41 | -         | -             | -             |

a) 5-Likert agreement scale: 1 - Totally disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Totally agree

From the nine barriers analyzed, only three recorded significant statistical results in the one-way ANOVA analysis (Table 18). The PBDA\_1 (p-value: 0.001; F: 3.995),

PBDA\_4 (p-value: 0.031; F: 2.360) and PBDA\_6 (p-value: 0.013; F: 2.759) differ statistically on their averages between the healthcare professionals surveyed. These results are the responsibility of the diversified views between senior health technicians and, physicians, nurses, and nutritionists. In this way, these professionals have statistically different opinions concerning the heterogeneity of electronic health records, lack of adequate infrastructure, and technical interoperability.

### 4.3.3. Patients by age group analysis

In general, and according to Table 19 (and Annex XIII), patients provided a linear view about the existence of barriers which influence the access to healthcare data. A neutral to slightly positive opinion was the overall feeling associated with the 9 surveyed barriers. On average, 30% to 40% of patients did not have a clear opinion on this matter while 38% to 48% agreed or totally agreed with its barriers' impact on their access to healthcare data (see Annex XIV). The lack of adequate infrastructure and cybersecurity risks achieved the highest level of agreeability (agreed or totally agreed) among patients. On average, more than 50% of patients of the age groups between 19 and 34 and 55 to 64 responded that they agreed or totally agreed with the existence of barriers.

As in the technology acceptance model results, the one-way ANOVA did not produce any significant results at a 5% significance value. The p-value varied between 0.867 and 0.070. The lowest value was associated with the lack of stakeholders' awareness. In this way, patients' age did not influence the perception about data access barriers.

Table 19. Patients' perspectives by age group about barriers preventing electronic access to health data: average and one-way ANOVA results

| Barriers preventing electronic access to health data <sup>a)</sup> | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|--------------------------------------------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                                                                    | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
| PBDA_1                                                             | 2.67 | 3.21    | 3.38    | 3.22    | 3.29    | 3.31    | 3.42 | 3.22      | 0.783         | 0.533         |
| PBDA_2                                                             | 2.67 | 3.05    | 3.29    | 3.23    | 3.36    | 3.20    | 3.39 | 3.17      | 0.741         | 0.586         |
| PBDA_3                                                             | 2.67 | 3.26    | 3.21    | 3.19    | 3.41    | 3.31    | 3.39 | 3.21      | 0.616         | 0.742         |
| PBDA_4                                                             | 2.67 | 3.63    | 3.56    | 3.43    | 3.43    | 3.58    | 3.33 | 3.38      | 0.655         | 0.694         |
| PBDA_5                                                             | 2.67 | 3.26    | 3.44    | 3.47    | 3.46    | 3.51    | 3.48 | 3.33      | 0.867         | 0.418         |

| Barriers preventing electronic access to health data <sup>a)</sup> | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|--------------------------------------------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                                                                    | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
| PBDA_6                                                             | 2.67 | 3.26    | 3.38    | 3.49    | 3.44    | 3.54    | 3.45 | 3.32      | 0.798         | 0.514         |
| PBDA_7                                                             | 2.67 | 3.26    | 3.33    | 3.32    | 3.14    | 3.15    | 3.27 | 3.16      | 0.777         | 0.541         |
| PBDA_8                                                             | 2.67 | 3.32    | 3.56    | 3.68    | 3.29    | 3.61    | 3.52 | 3.38      | 0.070         | 1.960         |
| PBDA_9                                                             | 2.67 | 3.32    | 3.52    | 3.40    | 3.14    | 3.38    | 3.30 | 3.25      | 0.317         | 1.178         |
| $\bar{X}$                                                          | 2.67 | 3.29    | 3.41    | 3.38    | 3.33    | 3.40    | 3.40 | -         | -             | -             |

a) 5-Likert agreement scale: 1 - Totally disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Totally agree

#### 4.4. Perspectives about the utility of selected healthcare data

The utility of selected healthcare data was assessed by inquiring healthcare stakeholders through the following statement: “Regarding the data related to the PUD\_n, please classify the access to them according to their utility degree”. To clarify the purpose of the questions, an initial question was also presented: “Do you consider the following data useful to achieve your personal and/or professional goals?”.

##### 4.4.1. All healthcare stakeholders analysis

According to Table 20 (Annex XV for standard deviation values), healthcare stakeholders found, in general, that the utility of data associated with PUD\_1 to PUD\_5 was higher than PUD\_6 and PUD\_7. This first overview demonstrates that data about the financial burden of healthcare systems and the time spent on it are less useful than clinical data and healthcare systems’ accessibility. Regarding PUD\_1, data about pregnancy, clinical and family history, and pathologies were, in general, perceived by stakeholders as the most useful data (more than 82% agreed or totally agreed, see Annex XVI). Data integrated on PUD\_2 about laboratory tests, imaging exams, and vital parameters also achieved the same relative results. PUD\_3’s vaccination and immunization data were perceived, on average, as the most useful data within its category (around 81% saw them as useful to very useful, see Annex XVI) while data about medicines achieved the highest average degree of utility on PUD\_4 (around 86% perceived it as useful to very useful, see Annex XVI). The costs related to medicines are of higher utility for stakeholders than the other types of costs (about 72% saw it as useful to very useful, see Annex XVI). As for

PUD\_6's data, the average time of treatment and the average time of waiting were the most useful data within their category (around 68% thought as useful or very useful, see Annex XVI). The lowest perceived data utility among all constructs was data about costs with human resources (around 61% of the stakeholders agreed or totally agreed with its utility, see Annex XVI).

The statistical analysis performed through the one-way ANOVA tool revealed several significant results. According to Table 20, PUD\_1 to PUD\_4 are the only ones that achieved significant outcomes at a 5% significance level. In PUD\_1, all data types achieved p-values inferior to 0.05. As for PUD\_2, meaningful results were achieved on data about anthropometric evaluation (p-value: 0.001; F: 4.687), laboratory tests (p-value: 0.000; F: 5.383), and vital parameters (p-value: 0.007; F: 3.548). The information categories about diet (p-value: 0.038; F: 2.553), antimicrobial resistance (p-value: 0.024; F: 2.817) and smoking (p-value: 0.000; F: 5.719) obtained significant differences between stakeholders' average values for PUD\_3. The laboratory consumables information category (p-value: 0.308; F: 1.204) was the only one with a non-significant result within the seven data categories available on PUD\_4. According to the post hoc test, the significant differences are mostly due to the divergent opinions between healthcare professionals and patients (present in all data defined as significant). Healthcare professionals were more positive than patients about the utility of the targeted data. However, the antimicrobial resistance category did not achieve significant results through the Tukey HSD analysis (the lowest p-value of 0.055 was between healthcare professionals and patients). Managers and patients also diverged on their opinions about the utility of habits data while healthcare professionals and administrators diverged about the utility of data about pathologies and drug interactions.

Table 20. Healthcare stakeholders' perspectives about healthcare data utility: average and one-way ANOVA results

| Primary information category | Secondary information category | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|--------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
| PUD_1 <sup>a)</sup>          | Allergies and intolerances     | 4.36 | 4.01 | 3.72 | 4.36 | 4.55 | 4.20      | 0.000         | 5.360         |
|                              | Demography                     | 3.71 | 3.47 | 3.61 | 4.05 | 3.91 | 3.75      | 0.016         | 3.056         |
|                              | Pregnancy                      | 4.31 | 3.88 | 4.11 | 4.36 | 4.45 | 4.22      | 0.000         | 7.020         |
|                              | Habits                         | 4.17 | 3.71 | 3.89 | 4.36 | 4.27 | 4.08      | 0.000         | 9.692         |

| Primary information category | Secondary information category                           | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|----------------------------------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                                          | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
| PUD_2 <sup>a)</sup>          | Clinical and family history                              | 4.37 | 4.09 | 3.78 | 4.55 | 4.55 | 4.27      | 0.001         | 4.773         |
|                              | Identification                                           | 4.48 | 3.97 | 4.17 | 4.36 | 4.09 | 4.21      | 0.000         | 11.764        |
|                              | Death                                                    | 4.07 | 3.73 | 3.56 | 4.18 | 3.82 | 3.87      | 0.001         | 4.745         |
|                              | Pathologies                                              | 4.56 | 4.13 | 3.89 | 4.50 | 4.55 | 4.33      | 0.000         | 8.687         |
|                              | $\bar{X}$                                                | 4.26 | 3.87 | 3.84 | 4.34 | 4.27 | -         | -             | -             |
|                              | Anthropometric evaluation                                | 4.01 | 3.68 | 3.83 | 4.14 | 4.18 | 3.97      | 0.001         | 4.687         |
|                              | Laboratory tests                                         | 4.45 | 4.09 | 4.06 | 4.36 | 4.36 | 4.26      | 0.000         | 5.383         |
|                              | Imaging exams                                            | 4.27 | 4.07 | 3.89 | 4.14 | 4.36 | 4.15      | 0.112         | 1.878         |
| PUD_3 <sup>a)</sup>          | Rapid tests                                              | 4.13 | 3.94 | 3.78 | 4.23 | 4.00 | 4.01      | 0.133         | 1.771         |
|                              | Physical exams                                           | 4.15 | 3.94 | 3.78 | 4.14 | 4.09 | 4.02      | 0.120         | 1.835         |
|                              | Electrocardiogram                                        | 4.09 | 4.01 | 3.94 | 4.14 | 4.36 | 4.11      | 0.718         | 0.524         |
|                              | Vital parameters                                         | 4.27 | 3.98 | 4.00 | 4.32 | 4.36 | 4.18      | 0.007         | 3.548         |
|                              | $\bar{X}$                                                | 4.20 | 3.96 | 3.90 | 4.21 | 4.25 | -         | -             | -             |
|                              | Vaccination and immunization                             | 4.30 | 4.16 | 3.94 | 4.41 | 4.18 | 4.20      | 0.319         | 1.179         |
|                              | Screenings                                               | 4.19 | 4.14 | 3.94 | 4.27 | 4.00 | 4.11      | 0.805         | 0.405         |
|                              | Diet                                                     | 4.05 | 3.79 | 3.72 | 4.00 | 3.91 | 3.89      | 0.038         | 2.553         |
| PUD_4 <sup>a)</sup>          | Physical activity                                        | 3.94 | 3.76 | 3.78 | 4.00 | 3.91 | 3.88      | 0.289         | 1.247         |
|                              | Antimicrobial resistance                                 | 4.19 | 3.95 | 3.72 | 4.18 | 4.55 | 4.12      | 0.024         | 2.817         |
|                              | Smoking                                                  | 4.19 | 3.79 | 3.89 | 4.18 | 4.27 | 4.06      | 0.000         | 5.719         |
|                              | Epidemiology                                             | 4.10 | 3.98 | 3.94 | 4.23 | 4.27 | 4.10      | 0.500         | 0.840         |
|                              | $\bar{X}$                                                | 4.14 | 3.94 | 3.85 | 4.18 | 4.16 | -         | -             | -             |
|                              | Medicines                                                | 4.55 | 4.06 | 4.06 | 4.41 | 4.36 | 4.29      | 0.000         | 5.921         |
|                              | Pharmaceutical products                                  | 4.28 | 4.06 | 4.06 | 3.86 | 4.36 | 4.12      | 0.004         | 3.831         |
|                              | Medical consumables                                      | 4.00 | 3.83 | 3.83 | 4.00 | 3.91 | 3.91      | 0.037         | 2.576         |
| PUD_5 <sup>a)</sup>          | Laboratory consumables                                   | 3.90 | 3.72 | 3.72 | 3.86 | 3.91 | 3.82      | 0.308         | 1.204         |
|                              | Drug interactions                                        | 4.38 | 3.61 | 3.61 | 4.36 | 4.36 | 4.07      | 0.000         | 6.330         |
|                              | Dosage                                                   | 4.38 | 3.67 | 3.67 | 4.36 | 4.09 | 4.03      | 0.000         | 5.425         |
|                              | Technical information about healthcare technologies      | 4.15 | 3.67 | 3.67 | 3.82 | 4.36 | 3.93      | 0.005         | 3.760         |
|                              | $\bar{X}$                                                | 4.23 | 3.80 | 3.80 | 4.10 | 4.19 | -         | -             | -             |
|                              | Access to emergency services                             | 4.14 | 3.99 | 4.33 | 4.27 | 4.27 | 4.20      | 0.252         | 1.345         |
|                              | Access to appointments                                   | 4.24 | 4.05 | 4.28 | 4.27 | 4.36 | 4.24      | 0.181         | 1.568         |
|                              | Access to treatments                                     | 4.27 | 4.05 | 4.22 | 4.36 | 4.36 | 4.25      | 0.066         | 2.212         |
| PUD_6 <sup>a)</sup>          | Access to surgeries                                      | 4.08 | 3.99 | 4.00 | 4.32 | 4.36 | 4.15      | 0.537         | 0.782         |
|                              | $\bar{X}$                                                | 4.18 | 4.02 | 4.21 | 4.31 | 4.34 | -         | -             | -             |
|                              | Cost with complementary diagnostic and therapeutic exams | 3.58 | 3.67 | 3.78 | 3.73 | 4.36 | 3.82      | 0.308         | 1.204         |
|                              | Cost with medicines                                      | 3.64 | 3.74 | 3.89 | 4.18 | 4.27 | 3.95      | 0.148         | 1.699         |
|                              | Cost with pharmaceutical products                        | 3.59 | 3.68 | 3.83 | 4.00 | 4.09 | 3.84      | 0.375         | 1.061         |
|                              | Cost with medical consumables                            | 3.52 | 3.58 | 3.61 | 3.95 | 4.00 | 3.73      | 0.411         | 0.992         |
|                              | Cost with laboratory consumables                         | 3.46 | 3.56 | 3.61 | 3.77 | 4.00 | 3.68      | 0.471         | 0.887         |
|                              | $\bar{X}$                                                | 3.54 | 3.61 | 3.71 | 3.91 | 4.14 | 3.79      | 0.000         | 1.204         |

| Primary information category | Secondary information category                | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|-----------------------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                               | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
|                              | Cost with human resources                     | 3.51 | 3.55 | 3.67 | 3.91 | 3.82 | 3.69      | 0.598         | 0.691         |
|                              | $\bar{X}$                                     | 3.55 | 3.63 | 3.73 | 3.92 | 4.09 | -         | -             | -             |
| PUD_7 <sup>a)</sup>          | Average time of appointment                   | 3.66 | 3.56 | 3.83 | 3.91 | 3.73 | 3.74      | 0.507         | 0.829         |
|                              | Average time of treatment                     | 3.71 | 3.62 | 3.78 | 3.95 | 3.82 | 3.78      | 0.586         | 0.709         |
|                              | Average time of waiting                       | 3.73 | 3.60 | 3.89 | 3.95 | 3.82 | 3.80      | 0.411         | 0.993         |
|                              | Average time of management and administration | 3.61 | 3.47 | 3.78 | 3.77 | 3.82 | 3.69      | 0.407         | 0.999         |
|                              | $\bar{X}$                                     | 3.68 | 3.56 | 3.82 | 3.90 | 3.80 | -         | -             | -             |

a) 5-Likert utility scale: 1 - Not useful at all; 2 - Not very useful; 3 - Moderately useful; 4 - Useful; 5 - Very useful

#### 4.4.2. Healthcare professionals analysis

The data retrieved showed that, in general, the surveyed healthcare workers viewed PUD\_1, PUD\_2, PUD\_3, PUD\_4, and PUD\_5 as more useful than the data from PUD\_6 and PUD\_7 (see Table 21). However, these two constructs possessed, on average, higher standard deviation value (see Annex XVII), demonstrating more volatile opinions among the professionals. For PUD\_1, pathologies, clinical and family history, and identification were perceived, on average, as the most useful data (over 87% stated this data, on average, was useful or very useful, see Annex XVIII). For PUD\_2, laboratory testing was perceived as the most useful data among the professionals (on average, 84,79% considered data useful to very useful). As for PUD\_3, the less useful data were about physical activity while antimicrobial resistance achieved the highest average value for very useful data (45.29%, according to Annex XVIII). Data about medicines was the most useful for patients' treatments (PUD\_4), according to healthcare workers' views (89.96%, see Annex XVIII). The accessibility of patients to healthcare services (PUD\_5) was viewed as useful or very useful by  $\pm 80\%$  of the healthcare professionals, while financial resources spent on healthcare (PUD\_6) and temporal resources spent on healthcare (PUD\_7) only achieved about 54% and 60%, respectively (see Annex XVIII). Physicians viewed PUD\_1 to PUD\_3 on average as more useful than other professionals. Nurses shared with physicians the usefulness of PUD\_4. Senior health technicians, pharmacists, and nurses thought PUD\_5, PUD\_6, and PUD\_7 as more useful, respectively.

Table 21. Healthcare professionals' perspectives about healthcare data utility: average and one-way ANOVA results

| Primary information category | Secondary information category                      | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|-----------------------------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                                     | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
| PUD_1 <sup>a)</sup>          | Allergies and intolerances                          | 4.37 | 4.47 | 4.44 | 4.44 | 3.08 | 3.93 | 4.80 | 4.22      | 0.000         | 4.288         |
|                              | Demography                                          | 3.79 | 3.86 | 3.73 | 3.66 | 3.08 | 3.20 | 4.10 | 3.63      | 0.112         | 1.738         |
|                              | Pregnancy                                           | 4.29 | 4.34 | 4.33 | 4.31 | 4.00 | 4.07 | 4.60 | 4.28      | 0.734         | 0.595         |
|                              | Habits                                              | 4.05 | 4.14 | 4.25 | 4.13 | 4.17 | 3.87 | 4.60 | 4.17      | 0.522         | 0.863         |
|                              | Clinical and family history                         | 4.34 | 4.21 | 4.46 | 4.41 | 4.33 | 4.33 | 4.50 | 4.37      | 0.783         | 0.533         |
|                              | Identification                                      | 4.11 | 4.57 | 4.60 | 4.41 | 4.42 | 4.27 | 4.70 | 4.44      | 0.017         | 2.639         |
|                              | Death                                               | 4.03 | 4.26 | 4.10 | 3.94 | 3.50 | 3.87 | 4.30 | 4.00      | 0.290         | 1.233         |
|                              | Pathologies                                         | 4.47 | 4.60 | 4.59 | 4.59 | 4.25 | 4.47 | 4.70 | 4.53      | 0.753         | 0.571         |
|                              | $\bar{X}$                                           | 4.18 | 4.31 | 4.31 | 4.23 | 3.85 | 4.00 | 4.54 | -         | -             | -             |
| PUD_2 <sup>a)</sup>          | Anthropometric evaluation                           | 3.74 | 3.91 | 4.18 | 4.16 | 3.42 | 3.80 | 4.50 | 3.96      | 0.029         | 2.381         |
|                              | Laboratory tests                                    | 4.26 | 4.59 | 4.46 | 4.50 | 3.75 | 4.47 | 4.80 | 4.40      | 0.020         | 2.555         |
|                              | Imaging exams                                       | 3.92 | 4.64 | 4.21 | 4.69 | 3.33 | 4.33 | 3.90 | 4.15      | 0.000         | 5.640         |
|                              | Rapid tests                                         | 4.00 | 4.24 | 4.18 | 4.16 | 3.75 | 4.20 | 3.70 | 4.03      | 0.420         | 1.008         |
|                              | Physical exams                                      | 3.87 | 4.26 | 4.26 | 4.16 | 3.75 | 3.93 | 4.30 | 4.08      | 0.194         | 1.455         |
|                              | Electrocardiogram                                   | 3.84 | 4.45 | 4.08 | 4.22 | 3.50 | 3.73 | 3.80 | 3.95      | 0.014         | 2.722         |
|                              | Vital parameters                                    | 3.95 | 4.29 | 4.44 | 4.28 | 3.67 | 4.13 | 4.30 | 4.15      | 0.017         | 2.642         |
|                              | $\bar{X}$                                           | 3.94 | 4.34 | 4.26 | 4.31 | 3.60 | 4.09 | 4.19 | -         | -             | -             |
| PUD_3 <sup>a)</sup>          | Vaccination and immunization                        | 4.24 | 4.41 | 4.49 | 3.91 | 3.83 | 4.20 | 3.80 | 4.13      | 0.007         | 3.025         |
|                              | Screenings                                          | 4.11 | 4.36 | 4.28 | 3.75 | 3.75 | 4.53 | 3.90 | 4.10      | 0.021         | 2.537         |
|                              | Diet                                                | 3.97 | 4.00 | 4.13 | 3.91 | 3.75 | 4.00 | 4.60 | 4.05      | 0.460         | 0.950         |
|                              | Physical activity                                   | 3.87 | 3.98 | 3.99 | 3.84 | 3.67 | 3.80 | 4.40 | 3.94      | 0.714         | 0.620         |
|                              | Antimicrobial resistance                            | 4.34 | 4.21 | 4.32 | 3.91 | 3.33 | 4.40 | 3.70 | 4.03      | 0.024         | 2.481         |
|                              | Smoking                                             | 4.13 | 4.29 | 4.24 | 4.19 | 3.58 | 4.00 | 4.30 | 4.10      | 0.372         | 1.084         |
|                              | Epidemiology                                        | 4.18 | 4.02 | 4.17 | 4.06 | 3.58 | 4.13 | 4.10 | 4.04      | 0.641         | 0.711         |
|                              | $\bar{X}$                                           | 4.12 | 4.18 | 4.23 | 3.94 | 3.64 | 4.15 | 4.11 | -         | -             | -             |
| PUD_4 <sup>a)</sup>          | Medicines                                           | 4.55 | 4.60 | 4.60 | 4.50 | 4.17 | 4.40 | 4.40 | 4.46      | 0.494         | 0.901         |
|                              | Pharmaceutical products                             | 4.53 | 4.28 | 4.24 | 4.13 | 4.17 | 4.27 | 4.40 | 4.29      | 0.606         | 0.755         |
|                              | Medical consumables                                 | 3.89 | 4.09 | 4.10 | 3.81 | 3.58 | 4.27 | 3.40 | 3.88      | 0.093         | 1.830         |
|                              | Laboratory consumables                              | 3.76 | 4.02 | 4.00 | 3.66 | 3.33 | 4.33 | 3.40 | 3.79      | 0.042         | 2.210         |
|                              | Drug interactions                                   | 4.39 | 4.43 | 4.46 | 4.25 | 4.08 | 4.33 | 4.00 | 4.28      | 0.615         | 0.743         |
|                              | Dosage                                              | 4.50 | 4.47 | 4.50 | 4.25 | 3.58 | 4.00 | 4.00 | 4.19      | 0.006         | 3.086         |
|                              | Technical information about healthcare technologies | 4.11 | 4.17 | 4.14 | 4.50 | 3.67 | 4.13 | 3.90 | 4.09      | 0.233         | 1.356         |
|                              | $\bar{X}$                                           | 4.25 | 4.29 | 4.29 | 4.16 | 3.80 | 4.25 | 3.93 | -         | -             | -             |
| PUD_5 <sup>a)</sup>          | Access to emergency services                        | 4.11 | 4.29 | 4.08 | 4.00 | 4.00 | 4.53 | 4.00 | 4.15      | 0.606         | 0.755         |
|                              | Access to appointments                              | 4.13 | 4.26 | 4.33 | 4.06 | 4.17 | 4.27 | 4.10 | 4.19      | 0.770         | 0.550         |
|                              | Access to treatments                                | 4.21 | 4.34 | 4.37 | 4.06 | 3.92 | 4.33 | 3.90 | 4.16      | 0.262         | 1.289         |

| Primary information category | Secondary information category                           | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|----------------------------------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                                          | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
|                              | Access to surgeries                                      | 4.11 | 4.19 | 4.01 | 4.16 | 3.50 | 4.53 | 3.90 | 4.06      | 0.287         | 1.239         |
|                              | $\bar{X}$                                                | 4.14 | 4.27 | 4.20 | 4.07 | 3.90 | 4.42 | 3.98 | -         | -             | -             |
| PUD_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 3.74 | 3.53 | 3.67 | 3.66 | 2.92 | 3.33 | 3.30 | 3.45      | 0.464         | 0.944         |
|                              | Cost with medicines                                      | 4.05 | 3.64 | 3.68 | 3.56 | 2.92 | 3.33 | 3.30 | 3.50      | 0.118         | 1.713         |
|                              | Cost with pharmaceutical products                        | 4.05 | 3.50 | 3.65 | 3.56 | 2.92 | 3.20 | 3.30 | 3.45      | 0.083         | 1.888         |
|                              | Cost with medical consumables                            | 3.79 | 3.28 | 3.66 | 3.50 | 2.92 | 3.40 | 3.30 | 3.41      | 0.207         | 1.421         |
|                              | Cost with laboratory consumables                         | 3.74 | 3.28 | 3.57 | 3.44 | 2.92 | 3.27 | 3.30 | 3.36      | 0.371         | 1.087         |
|                              | Cost with human resources                                | 3.76 | 3.33 | 3.62 | 3.53 | 2.92 | 3.27 | 3.40 | 3.40      | 0.357         | 1.109         |
|                              | $\bar{X}$                                                | 3.86 | 3.43 | 3.64 | 3.54 | 2.92 | 3.30 | 3.32 | -         | -             | -             |
| PUD_7 <sup>a)</sup>          | Average time of appointment                              | 3.53 | 3.55 | 3.88 | 3.38 | 3.33 | 3.53 | 3.90 | 3.59      | 0.215         | 1.398         |
|                              | Average time of treatment                                | 3.89 | 3.59 | 3.90 | 3.44 | 3.33 | 3.60 | 3.30 | 3.58      | 0.135         | 1.645         |
|                              | Average time of waiting                                  | 3.68 | 3.71 | 3.89 | 3.34 | 3.83 | 3.53 | 3.70 | 3.67      | 0.365         | 1.095         |
|                              | Average time of management and administration            | 3.71 | 3.57 | 3.79 | 3.28 | 3.33 | 3.40 | 3.10 | 3.46      | 0.178         | 1.502         |
|                              | $\bar{X}$                                                | 3.70 | 3.60 | 3.86 | 3.36 | 3.46 | 3.52 | 3.50 | -         | -             | -             |

a) 5-Likert utility scale: 1 – Not useful at all; 2 – Not very useful; 3 – Moderately useful; 4 – Useful; 5 – Very useful

According to Table 21, only the first five utility constructs achieved p-values under 0.05. Regarding PUD\_1, allergies and intolerances data (p-value: 0.000; F: 4.288) and identification data (p-value: 0.017; F: 2.639) are the ones where diverging means values exist between the professionals. The diagnostic and evaluation of patients' health (PUD\_2) possess the highest number of statistically significant results, namely anthropometric evaluation data (p-value: 0.029; F: 2.381), laboratory testing data (p-value: 0.020; F: 2.555), imaging exams data (p-value: 0.000; F: 5.640), electrocardiogram data (p-value: 0.014; F: 2.722) and vital parameters data (p-value: 0.017; F: 2.642). Vaccination and immunization data (p-value: 0.007; F: 3.025) screenings data (p-value: 0.021; F: 2.537) and antimicrobial resistance data (p-value: 0.024; F: 2.481) composed the significant results for PUD\_3. Laboratory consumables data (p-value: 0.042; F: 2.210) and dosage data (p-value: 0.006; F: 3.086) appeared to have different levels of usefulness between the surveyed healthcare professionals to patients' treatments (PUD\_4). The divergence of opinion in allergies and intolerances data was largely due to psychologists' views versus all the other professionals' views (except for senior health technicians) while in the identification data was due to different opinions of pharmacists with physicians and nurses. Psychologists diverged with physicians and nutritionists about laboratory testing

data, pharmacists diverged with physicians and senior diagnostic and therapeutic technicians and, psychologists with physicians, nurses and senior diagnostic and therapeutic technicians when data is about imaging exams, and pharmacists with nurses when it comes to vital parameters data. One-way ANOVA's Tukey analysis did not find any significant results to explain the differences in electrocardiogram data views (nonetheless physicians vs. pharmacists and psychologists registered the similar lowest above 0.05 p-values). Nurses had statistical different opinions about vaccination and immunization data when compared with senior diagnostic and therapeutic technicians. Screening data did not produce specific meaningful results as no p-value was inferior to 0.05 (the lowest p-value was registered by senior diagnostic and therapeutic technicians vs. physicians). The antimicrobial resistance data is viewed differently between nurses and psychologists. As for PUD\_4, there were no significant statistical results between groups for laboratory consumables data (lowest p-value of 0.147 registered between psychologists and senior health technicians) while dosage data revealed specific differences between psychologists and, pharmacists, physicians, and nurses.

#### **4.4.3. Patients by age group analysis**

As for the patients' age group analysis, and according to Table 22, all PUD constructs achieved, on average, a positive level of usefulness of the selected data. PUD\_1 to PUD\_5 registered a higher average of utility than PUD\_6 and PUD\_7, meaning that healthcare costs and waiting times are perceived as less useful than the other survey healthcare data (see Annex XIX for standard deviation values). For PUD\_1, higher levels of utility (on average, above 70% of patients perceived as useful to very useful, see Annex XX) were associated with pathologies, clinical and family history and allergies and intolerances. Regarding PUD\_2, only laboratory tests and imaging exams surpassed the 70% threshold of useful to very useful data. Data about prevention and promotion of patients' health (PUD\_3), vaccination and immunization and screenings data are, on average, the most useful (76% to 78% thought they as useful to very useful, see Annex XX). Medicines, drug interactions and dosage are among the most useful data from PUD\_4. In PUD\_5, the 4 data types obtain homogeneous results (around 70% found them useful to very useful). The last two constructs revealed that the cost of medicines and the average time of treatment are the ones with higher average utility within PUD\_6 and PUD\_7,

respectively. As for the age group analysis, patients between 25 to 34 are the ones who found almost all PUD constructs has been the most useful on average (except on PUD\_7, where patients aged from 35 to 44 took the lead).

Table 22. Patients' perspectives by age group about healthcare data utility: average and one-way ANOVA results

| Primary information category | Secondary information category | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|--------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                              |                                | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
| PUD_1 <sup>a)</sup>          | Allergies and intolerances     | 3.33 | 4.16    | 4.27    | 4.04    | 4.03    | 3.87    | 3.76 | 3.92      | 0.354         | 1.112         |
|                              | Demography                     | 3.33 | 3.16    | 3.67    | 3.67    | 3.38    | 3.35    | 3.15 | 3.39      | 0.115         | 1.719         |
|                              | Pregnancy                      | 3.33 | 3.74    | 4.31    | 3.93    | 3.84    | 3.72    | 3.64 | 3.79      | 0.111         | 1.739         |
|                              | Habits                         | 3.33 | 3.74    | 3.90    | 3.83    | 3.65    | 3.55    | 3.45 | 3.64      | 0.318         | 1.176         |
|                              | Clinical and family history    | 3.33 | 4.00    | 4.42    | 4.14    | 4.04    | 3.99    | 3.88 | 3.97      | 0.199         | 1.438         |
|                              | Identification                 | 3.33 | 4.00    | 4.25    | 4.06    | 3.97    | 3.76    | 3.73 | 3.87      | 0.136         | 1.635         |
|                              | Death                          | 3.33 | 3.53    | 3.94    | 3.87    | 3.66    | 3.55    | 3.58 | 3.64      | 0.319         | 1.174         |
|                              | Pathologies                    | 3.33 | 4.05    | 4.48    | 4.21    | 4.08    | 3.99    | 3.91 | 4.01      | 0.121         | 1.694         |
|                              | $\bar{X}$                      | 3.33 | 3.80    | 4.16    | 3.97    | 3.83    | 3.72    | 3.64 | -         | -             | -             |
| PUD_2 <sup>a)</sup>          | Anthropometric evaluation      | 3.33 | 3.63    | 3.71    | 3.87    | 3.66    | 3.61    | 3.18 | 3.57      | 0.122         | 1.690         |
|                              | Laboratory tests               | 3.33 | 4.11    | 4.40    | 4.16    | 4.00    | 4.01    | 3.91 | 3.99      | 0.244         | 1.326         |
|                              | Imaging exams                  | 3.33 | 4.00    | 4.27    | 4.14    | 3.98    | 4.03    | 3.91 | 3.95      | 0.569         | 0.802         |
|                              | Rapid tests                    | 3.33 | 3.89    | 4.12    | 4.04    | 3.93    | 3.83    | 3.64 | 3.83      | 0.411         | 1.022         |
|                              | Physical exams                 | 3.33 | 4.11    | 4.17    | 4.01    | 3.92    | 3.83    | 3.64 | 3.86      | 0.372         | 1.082         |
|                              | Electrocardiogram              | 3.33 | 3.95    | 4.29    | 4.07    | 3.98    | 3.92    | 3.70 | 3.89      | 0.296         | 1.218         |
|                              | Vital parameters               | 3.33 | 4.05    | 4.19    | 4.07    | 3.94    | 3.89    | 3.61 | 3.87      | 0.284         | 1.241         |
|                              | $\bar{X}$                      | 3.33 | 3.96    | 4.16    | 4.05    | 3.92    | 3.87    | 3.65 | -         | -             | -             |
| PUD_3 <sup>a)</sup>          | Vaccination and immunization   | 3.67 | 4.00    | 4.44    | 4.18    | 4.12    | 4.08    | 4.12 | 4.09      | 0.566         | 0.806         |
|                              | Screenings                     | 3.67 | 4.11    | 4.35    | 4.13    | 4.06    | 4.18    | 4.06 | 4.08      | 0.786         | 0.530         |
|                              | Diet                           | 3.67 | 3.95    | 3.88    | 3.79    | 3.74    | 3.79    | 3.76 | 3.80      | 0.984         | 0.174         |
|                              | Physical activity              | 3.67 | 3.95    | 3.83    | 3.79    | 3.73    | 3.82    | 3.48 | 3.75      | 0.818         | 0.487         |
|                              | Antimicrobial resistance       | 3.67 | 4.00    | 4.04    | 4.02    | 3.89    | 4.00    | 3.67 | 3.90      | 0.763         | 0.559         |
|                              | Smoking                        | 4.00 | 4.00    | 3.92    | 3.84    | 3.76    | 3.76    | 3.45 | 3.82      | 0.638         | 0.715         |
|                              | Epidemiology                   | 3.67 | 4.05    | 4.25    | 3.96    | 3.96    | 4.01    | 3.58 | 3.93      | 0.267         | 1.276         |
|                              | $\bar{X}$                      | 3.71 | 4.01    | 4.10    | 3.96    | 3.89    | 3.95    | 3.73 | -         | -             | -             |
| PUD_4 <sup>a)</sup>          | Medicines                      | 3.33 | 4.16    | 4.44    | 4.29    | 4.14    | 4.15    | 3.88 | 4.06      | 0.155         | 1.567         |
|                              | Pharmaceutical products        | 3.33 | 3.89    | 4.12    | 4.03    | 3.99    | 3.92    | 3.82 | 3.87      | 0.800         | 0.511         |
|                              | Medical consumables            | 3.33 | 3.95    | 3.75    | 3.81    | 3.71    | 3.59    | 3.67 | 3.69      | 0.856         | 0.434         |
|                              | Laboratory consumables         | 3.33 | 3.84    | 3.71    | 3.82    | 3.70    | 3.54    | 3.67 | 3.66      | 0.795         | 0.517         |
|                              | Drug interactions              | 3.33 | 4.11    | 4.21    | 4.03    | 4.05    | 3.86    | 3.79 | 3.91      | 0.507         | 0.883         |

| Primary information category | Secondary information category                           | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|----------------------------------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                              |                                                          | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
|                              | Dosage                                                   | 3.33 | 4.00    | 4.29    | 4.10    | 4.04    | 3.85    | 3.82 | 3.92      | 0.329         | 1.155         |
|                              | Technical information about healthcare technologies      | 3.33 | 4.00    | 4.04    | 3.95    | 3.89    | 3.61    | 3.70 | 3.79      | 0.329         | 1.157         |
|                              | $\bar{X}$                                                | 3.33 | 3.99    | 4.08    | 4.01    | 3.93    | 3.79    | 3.76 | -         | -             | -             |
|                              | Access to emergency services                             | 3.33 | 3.89    | 4.37    | 4.02    | 3.86    | 3.94    | 3.88 | 3.90      | 0.263         | 1.286         |
|                              | Access to appointments                                   | 3.33 | 4.11    | 4.40    | 4.12    | 3.94    | 3.96    | 3.85 | 3.96      | 0.196         | 1.446         |
| PUD_5 <sup>a)</sup>          | Access to treatments                                     | 3.33 | 4.05    | 4.37    | 4.11    | 3.95    | 3.96    | 3.85 | 3.95      | 0.288         | 1.234         |
|                              | Access to surgeries                                      | 3.33 | 4.16    | 4.21    | 4.08    | 3.89    | 3.90    | 3.82 | 3.91      | 0.509         | 0.880         |
|                              | $\bar{X}$                                                | 3.33 | 4.05    | 4.34    | 4.08    | 3.91    | 3.94    | 3.85 | -         | -             | -             |
|                              |                                                          |      |         |         |         |         |         |      |           |               |               |
| PUD_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 3.33 | 3.63    | 4.04    | 3.75    | 3.49    | 3.56    | 3.67 | 3.64      | 0.214         | 1.399         |
|                              | Cost with medicines                                      | 3.33 | 3.84    | 4.19    | 3.87    | 3.59    | 3.52    | 3.55 | 3.70      | 0.043         | 2.195         |
|                              | Cost with pharmaceutical products                        | 3.33 | 3.74    | 4.08    | 3.75    | 3.59    | 3.49    | 3.55 | 3.65      | 0.185         | 1.475         |
|                              | Cost with medical consumables                            | 3.33 | 3.79    | 3.85    | 3.61    | 3.47    | 3.44    | 3.61 | 3.58      | 0.545         | 0.833         |
|                              | Cost with laboratory consumables                         | 3.33 | 3.68    | 3.81    | 3.60    | 3.45    | 3.44    | 3.58 | 3.56      | 0.683         | 0.658         |
|                              | Cost with human resources                                | 3.33 | 3.63    | 3.79    | 3.57    | 3.45    | 3.48    | 3.52 | 3.54      | 0.797         | 0.516         |
|                              | $\bar{X}$                                                | 3.33 | 3.72    | 3.96    | 3.69    | 3.51    | 3.49    | 3.58 | -         | -             | -             |
| PUD_7 <sup>a)</sup>          | Average time of appointment                              | 3.33 | 3.42    | 3.63    | 3.73    | 3.44    | 3.49    | 3.39 | 3.49      | 0.584         | 0.783         |
|                              | Average time of treatment                                | 3.33 | 3.47    | 3.77    | 3.80    | 3.46    | 3.51    | 3.55 | 3.56      | 0.354         | 1.112         |
|                              | Average time of waiting                                  | 3.33 | 3.26    | 3.67    | 3.83    | 3.42    | 3.54    | 3.48 | 3.51      | 0.253         | 1.307         |
|                              | Average time of management and administration            | 3.33 | 3.26    | 3.48    | 3.71    | 3.35    | 3.41    | 3.24 | 3.40      | 0.294         | 1.222         |
|                              | $\bar{X}$                                                | 3.33 | 3.36    | 3.64    | 3.77    | 3.42    | 3.49    | 3.42 | -         | -             | -             |

a) 5-LikerT utility scale: 1 - Not useful at all; 2 - Not very useful; 3 - Moderately useful; 4 - Useful; 5 - Very useful

According to Table 22, only one result achieved a p-value below 0.05 when performed a one-way ANOVA analysis. PUD\_6' cost with medicines obtained a p-value of 0.043, meaning that, at a 5% significance level, there were statistical differences between the means of the patients' age groups. However, and according to the Tukey post doc analysis, no significative difference related to the cost of medicines was found between the age groups.

#### 4.5. Perspectives about the importance of selected healthcare data

Similarly to the section about the perceived utility of data, a statement adapted to the importance of data was produced to retrieve healthcare stakeholders' opinions: "Regarding the data related to the PID\_n, please classify the access to them according to

their importance degree”. Moreover, an opening question was added to guide stakeholders into an assertive answer: “Do you consider the following data important for the quality increase of healthcare provision?”.

#### **4.5.1. All healthcare stakeholders analysis**

The healthcare stakeholders’ opinions about the importance of selected healthcare data to optimize the quality of the Azorean healthcare system are shown in Table 23 (see Annex XXI for standard deviation results). Comparing results from the utility of data (Table 20) with data importance revealed that, on average, stakeholders think that data is slightly more important for healthcare systems than useful for their daily activities. For example, patients and administrators improved the positivity of their views on data when importance was assessed. Healthcare stakeholders found, in general, that the importance of data associated with PID\_1 to PID\_5 was higher than PID\_6 and PID\_7 (likewise the utility analysis), meaning that financial and temporal resources are less important than clinical resources for the enhancement of the quality of services provided by the healthcare system. PID\_1’s categories results showed that allergies and intolerances, clinical and family history, and pathologies information are, on average, healthcare stakeholders’ most important data categories (more than 86% saw them as important to very important, see Annex XXII). The last six data categories of PID\_2 are, on average, seen as highly important (between 85% to 89% perceived them as important to very important), as anthropometric evaluation data only obtained around 81%. Antimicrobial resistance and, vaccination and immunization data are viewed by 89% to 90% of healthcare stakeholders as important or very important to healthcare systems. Information about medicines, dosage, and drug interactions were among the most important categories, as between 89 to 90% of stakeholders perceived them, on average, as being important to very important. PID\_5’s categories had a comparable level of importance (around 80% perceived them as important to very important). Costs related to complementary diagnostic and therapeutic exams, medicines, and pharmaceutical products were among the most important with PID\_6 (76% to 79% saw them as important to very important). 79% to 85% of healthcare stakeholders thought that data about temporal resources spent on healthcare were important to very important. Interestingly,

patients and healthcare professionals seemed to attribute less importance to PID\_6 (costs) and PID\_7 (time) than the other stakeholders.

Table 23. Healthcare stakeholders' perspectives about healthcare data importance: average and one-way ANOVA results

| Primary information category | Secondary information category                      | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|-----------------------------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                                     | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
| PID_1 <sup>a)</sup>          | Allergies and intolerances                          | 4.67 | 4.23 | 4.39 | 4.41 | 4.36 | 4.41      | 0.000         | 9.582         |
|                              | Demography                                          | 3.88 | 3.70 | 4.11 | 3.82 | 4.00 | 3.90      | 0.137         | 1.750         |
|                              | Pregnancy                                           | 4.51 | 4.05 | 4.44 | 4.14 | 4.18 | 4.26      | 0.000         | 8.956         |
|                              | Habits                                              | 4.41 | 3.87 | 4.39 | 4.09 | 4.18 | 4.19      | 0.000         | 13.570        |
|                              | Clinical and family history                         | 4.55 | 4.19 | 4.44 | 4.32 | 4.27 | 4.35      | 0.000         | 6.532         |
|                              | Identification                                      | 4.56 | 4.03 | 4.33 | 4.36 | 4.00 | 4.26      | 0.000         | 13.025        |
|                              | Death                                               | 4.23 | 3.88 | 4.33 | 4.09 | 3.91 | 4.09      | 0.001         | 4.848         |
|                              | Pathologies                                         | 4.68 | 4.22 | 4.33 | 4.45 | 4.27 | 4.39      | 0.000         | 10.635        |
| $\bar{X}$                    |                                                     | 4.43 | 4.02 | 4.35 | 4.21 | 4.15 | -         | -             | -             |
| PID_2 <sup>a)</sup>          | Anthropometric evaluation                           | 4.19 | 3.87 | 4.06 | 4.27 | 4.27 | 4.13      | 0.001         | 4.615         |
|                              | Laboratory tests                                    | 4.45 | 4.20 | 4.28 | 4.41 | 4.55 | 4.38      | 0.012         | 3.230         |
|                              | Imaging exams                                       | 4.45 | 4.20 | 4.28 | 4.36 | 4.55 | 4.37      | 0.014         | 3.144         |
|                              | Rapid tests                                         | 4.20 | 4.07 | 4.17 | 4.36 | 4.36 | 4.23      | 0.287         | 1.253         |
|                              | Physical exams                                      | 4.29 | 4.11 | 4.17 | 4.32 | 4.27 | 4.23      | 0.191         | 1.531         |
|                              | Electrocardiogram                                   | 4.28 | 4.20 | 4.33 | 4.32 | 4.55 | 4.33      | 0.604         | 0.683         |
|                              | Vital parameters                                    | 4.42 | 4.17 | 4.22 | 4.50 | 4.55 | 4.37      | 0.010         | 3.372         |
| $\bar{X}$                    |                                                     | 4.32 | 4.12 | 4.21 | 4.36 | 4.44 | -         | -             | -             |
| PID_3 <sup>a)</sup>          | Vaccination and immunization                        | 4.50 | 4.20 | 4.28 | 4.59 | 4.45 | 4.41      | 0.001         | 4.631         |
|                              | Screenings                                          | 4.37 | 4.19 | 4.22 | 4.36 | 4.27 | 4.28      | 0.169         | 1.613         |
|                              | Diet                                                | 4.28 | 3.91 | 4.22 | 4.36 | 4.09 | 4.17      | 0.000         | 6.373         |
|                              | Physical activity                                   | 4.22 | 3.88 | 4.17 | 4.23 | 4.18 | 4.14      | 0.000         | 5.124         |
|                              | Antimicrobial resistance                            | 4.44 | 4.10 | 4.28 | 4.50 | 4.55 | 4.37      | 0.000         | 5.745         |
|                              | Smoking                                             | 4.34 | 3.94 | 4.33 | 4.09 | 4.45 | 4.23      | 0.000         | 7.397         |
|                              | Epidemiology                                        | 4.22 | 4.11 | 4.22 | 4.18 | 4.27 | 4.20      | 0.666         | 0.596         |
| $\bar{X}$                    |                                                     | 4.34 | 4.05 | 4.25 | 4.33 | 4.32 | -         | -             | -             |
| PID_4 <sup>a)</sup>          | Medicines                                           | 4.59 | 4.23 | 4.39 | 4.55 | 4.45 | 4.44      | 0.000         | 6.487         |
|                              | Pharmaceutical products                             | 4.33 | 4.03 | 4.22 | 4.27 | 4.27 | 4.23      | 0.003         | 3.994         |
|                              | Medical consumables                                 | 4.06 | 3.84 | 4.06 | 4.18 | 4.27 | 4.08      | 0.048         | 2.407         |
|                              | Laboratory consumables                              | 4.01 | 3.83 | 4.17 | 4.23 | 4.27 | 4.10      | 0.066         | 2.217         |
|                              | Drug interactions                                   | 4.47 | 4.08 | 4.28 | 4.41 | 4.36 | 4.32      | 0.000         | 6.972         |
|                              | Dosage                                              | 4.47 | 4.14 | 4.28 | 4.32 | 4.36 | 4.31      | 0.001         | 4.766         |
|                              | Technical information about healthcare technologies | 4.17 | 3.94 | 4.22 | 4.09 | 4.36 | 4.16      | 0.036         | 2.585         |

| Primary information category | Secondary information category                           | Mean |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|----------------------------------------------------------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                                          | Hpro | Pati | Admi | Mana | Pmkr | $\bar{X}$ |               |               |
|                              | $\bar{X}$                                                | 4.30 | 4.01 | 4.23 | 4.29 | 4.34 | -         | -             | -             |
| PID_5 <sup>a)</sup>          | Access to emergency services                             | 4.31 | 4.17 | 4.44 | 4.36 | 4.36 | 4.33      | 0.326         | 1.163         |
|                              | Access to appointments                                   | 4.35 | 4.19 | 4.44 | 4.18 | 4.36 | 4.31      | 0.187         | 1.545         |
|                              | Access to treatments                                     | 4.31 | 4.20 | 4.44 | 4.27 | 4.36 | 4.32      | 0.499         | 0.842         |
|                              | Access to surgeries                                      | 4.27 | 4.19 | 4.44 | 4.50 | 4.36 | 4.35      | 0.422         | 0.972         |
|                              | $\bar{X}$                                                | 4.31 | 4.19 | 4.44 | 4.33 | 4.36 | -         | -             | -             |
| PID_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 3.88 | 3.82 | 4.22 | 4.00 | 4.36 | 4.06      | 0.268         | 1.301         |
|                              | Cost with medicines                                      | 3.93 | 3.88 | 4.22 | 4.23 | 4.27 | 4.11      | 0.311         | 1.198         |
|                              | Cost with pharmaceutical products                        | 3.85 | 3.81 | 4.22 | 4.09 | 4.00 | 3.99      | 0.431         | 0.956         |
|                              | Cost with medical consumables                            | 3.79 | 3.71 | 4.00 | 4.05 | 3.82 | 3.87      | 0.482         | 0.869         |
|                              | Cost with laboratory consumables                         | 3.77 | 3.70 | 4.11 | 3.95 | 3.91 | 3.89      | 0.432         | 0.954         |
|                              | Cost with human resources                                | 3.80 | 3.73 | 4.11 | 4.14 | 3.82 | 3.92      | 0.318         | 1.181         |
|                              | $\bar{X}$                                                | 3.84 | 3.78 | 4.15 | 4.08 | 4.03 | -         | -             | -             |
| PID_7 <sup>a)</sup>          | Average time of appointment                              | 3.89 | 3.88 | 4.33 | 4.27 | 4.55 | 4.18      | 0.049         | 2.403         |
|                              | Average time of treatment                                | 3.91 | 3.93 | 4.33 | 4.14 | 4.55 | 4.17      | 0.128         | 1.794         |
|                              | Average time of waiting                                  | 3.96 | 3.93 | 4.33 | 4.27 | 4.55 | 4.21      | 0.102         | 1.938         |
|                              | Average time of management and administration            | 3.86 | 3.78 | 4.22 | 4.00 | 4.64 | 4.10      | 0.050         | 2.386         |
|                              | $\bar{X}$                                                | 3.90 | 3.88 | 4.31 | 4.17 | 4.57 | -         | -             | -             |

a) 5-Likert importance scale: 1 - Not important at all; 2 - Not very important; 3 - Moderately important; 4 - Important; 5 - Very important

Healthcare stakeholders' views were assessed to verify possible differences between the mean values. Data analyzed by the one-way ANOVA tool revealed that five PID constructs obtained significant results ( $p\text{-value} \leq 0.05$ ), namely PID\_1 to PID\_4 and PID\_7. According to Table 23, demography data ( $p\text{-value}$ : 0.137;  $F$ : 1.750) was the only non-significant data on PID\_1. As for PID\_2, five data categories (anthropometric evaluation, laboratory tests, imaging exams, and vital parameters) presented  $p\text{-values}$  below 0.05. Screenings and epidemiology data were the only non-significant results for PID\_3 while the laboratory consumables category (PID\_4) was the only one that registered non-significant differences in mean values. Contrary to the utility analysis, the PID\_7 construct obtained significance in two categories, the average time of appointment ( $p\text{-value}$ : 0.049;  $F$ : 2.403) and the average time of management and administration ( $p\text{-value}$ : 0.050;  $F$ : 2.386). The validation, by the Tukey HSD post hoc test of the statistical differences previously reported, demonstrated that they were solely because of the different views between patients and healthcare professionals. However, Tukey HSD post

hoc test for medical consumables, the average time of appointment, and the average time of management and administration did not confirm the ANOVA significance as the lowest p-values in the post hoc test were around 0.08 (between patients and healthcare professionals).

#### **4.5.2. Healthcare professionals analysis**

The answers of the surveyed participants healthcare professionals revealed heterogeneous opinions about the importance of different types of data. According to Table 24 (see standard deviation values on Annex XXIII), healthcare professionals perceived, in general, PID\_6 and PID\_7 data as less important than the other constructs of Perceived Importance of Healthcare Data. Pathologies, clinical and family history, allergies and intolerances, and pregnancy are the most important data of PID\_1 (more than 92% found them important to very important, see Annex XXIV). For PID\_2, laboratory tests and vital parameters achieve, on average, about 85% of the professionals considered important to very important these data, registering the highest scores (Annex XXIV). As for PID\_3 and like in PID\_2, about 85% considered vaccination and immunization, and screenings as the most important data within this construct (Annex XXIV). However, antimicrobial resistance registered the highest “very important” average score (49.17%, see Annex XXIV). Medicines data was the most important data about patients’ treatments (PID\_4) with more than 90% of the healthcare professionals believing this data to be important to very important, followed by drug interactions with 86.70% (Annex XXIV). The access to healthcare services data revealed that access to emergency services and access to appointments are the most important data for the professionals (between 85% to 87% saw them as important to very important, see Annex XXIV). As previously stated, the final two constructed were seen as less important, but between them, the less important was PID\_6 (costs), as only about 60% saw this type of data to be important to very important (Annex XXIV). Nutritionists, physicians and nurses viewed, on average, PID\_1 as more important than other professionals. PID\_2 was more important to physicians and nurses. As for PID\_3, PID\_4, and PID\_5 pharmacists joined physicians and nurses as the professionals seeing this type of data as more important for healthcare systems. Nurses and pharmacists saw, on average, healthcare costs data as more important

while temporal resources were more important for physicians and nurses (more than 70% valued them as important to very important in both constructs, respectively).

The statistical analysis performed through the one-way ANOVA tool revealed several significant results (see Table 24). Data regarding patients' general information (PID\_1) achieved two significant results, namely for allergies and intolerances (p-value: 0.004; F: 3.316) and identification (p-value: 0.019; F: 2.584), meaning that meaningful differences have been found between the mean values achieved by the different healthcare professionals. For PID\_2, all data types registered significant differences in mean values (p-value  $\leq$  0.05). Vaccination and immunization (p-value: 0.004; F: 3.316), antimicrobial resistance (p-value: 0.004; F: 3.316), and smoking (p-value: 0.009; F: 2.901) are the data types that obtained significant results in PID\_3. As for PID\_4, almost all data types registered p-values inferior to 0.05, except for pharmaceutical products (p-value: 0.384; F: 1.065). The last three constructs presented intra-homogeneous results. For data cluster PID\_5, all results were statistically significant, while for PID\_6 and PID\_7 all p-values were above 0.05 (without statistical differences among their mean values). The Tukey's analysis found that the difference in the mean values in allergies and intolerances is due to different views between psychologists and, nurses, physicians, and pharmacists. Nurses' and pharmacists' divergent views about identification data are the cause of the significant results obtained in the ANOVA analysis. For PID\_2 the differences were almost attributed to different views of psychologists with other professionals: (1) anthropometric evaluation views with nutritionists; (2) laboratory tests views with pharmacists, physicians, nurses, senior diagnostic and therapeutic technicians, and nutritionists; (3) imaging exams views with physicians, nurses, and senior diagnostic and therapeutic technicians; did not find rapid physical; (4) electrocardiogram data views with physicians; (5) vital parameters data views with physicians and nurses. For the rapid tests and physical exams, the secondary analysis did not find significant results. The different perspectives within cluster PID\_3 about vaccination and immunization data resulted from the different opinions of nurses with senior diagnostic and therapeutic technicians, senior health technicians, and nutritionists. Psychologists viewed antimicrobial resistance data differently from pharmacists and nurses while senior diagnostic and therapeutic technicians diverged only with nurses. Smoking data importance perceptions varied between psychologists and other professions, such as pharmacists, nurses and physicians. PID\_4 cluster data about medical and laboratory consumables were significantly different

between psychologists and nurses. Data about dosage obtained different views from: (1) senior health technicians vs. pharmacists, physicians, nurses, and senior diagnostic and therapeutic technicians; and (2) psychologists vs. pharmacists, physicians, and nurses. Technical information about healthcare technologies was not equally viewed between pharmacists and senior health technicians while nurses and senior diagnostic and therapeutic technicians shared divergent views with senior health technicians and psychologists. As for the importance of medicines and drug interactions data for patients' treatments, ANOVA's Tukey analysis did not find any significant differences between the surveyed population. Regarding healthcare access data, nurses had different opinions from senior diagnostic and therapeutic technicians about the importance of data about access to emergency services, appointments, and treatments. Through Tukey's analysis, no relevant differences between healthcare professionals were found for data about access to surgeries.

Table 24. Healthcare professionals' perspectives about healthcare data importance: average and one-way ANOVA results

| Primary information category | Secondary information category | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|--------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
| PID_1 <sup>a)</sup>          | Allergies and intolerances     | 4.66 | 4.74 | 4.77 | 4.59 | 4.00 | 4.40 | 4.70 | 4.55      | 0.004         | 3.316         |
|                              | Demography                     | 3.89 | 3.98 | 3.91 | 3.81 | 3.67 | 3.40 | 4.10 | 3.82      | 0.424         | 1.002         |
|                              | Pregnancy                      | 4.58 | 4.64 | 4.52 | 4.50 | 4.08 | 4.07 | 4.50 | 4.41      | 0.050         | 2.131         |
|                              | Habits                         | 4.24 | 4.41 | 4.47 | 4.47 | 4.25 | 4.13 | 4.70 | 4.38      | 0.283         | 1.245         |
|                              | Clinical and family history    | 4.53 | 4.45 | 4.59 | 4.59 | 4.50 | 4.60 | 4.60 | 4.55      | 0.878         | 0.400         |
|                              | Identification                 | 4.29 | 4.66 | 4.67 | 4.44 | 4.50 | 4.27 | 4.70 | 4.50      | 0.019         | 2.584         |
|                              | Death                          | 4.11 | 4.43 | 4.32 | 4.03 | 3.83 | 3.87 | 4.20 | 4.11      | 0.110         | 1.751         |
|                              | Pathologies                    | 4.66 | 4.72 | 4.74 | 4.75 | 4.17 | 4.47 | 4.70 | 4.60      | 0.061         | 2.042         |
|                              | $\bar{X}$                      | 4.37 | 4.50 | 4.50 | 4.40 | 4.13 | 4.15 | 4.53 | -         | -             | -             |
| PID_2 <sup>a)</sup>          | Anthropometric evaluation      | 4.11 | 4.24 | 4.32 | 4.03 | 3.58 | 3.73 | 4.70 | 4.10      | 0.008         | 2.988         |
|                              | Laboratory tests               | 4.34 | 4.62 | 4.54 | 4.31 | 3.50 | 4.33 | 4.70 | 4.34      | 0.000         | 4.527         |
|                              | Imaging exams                  | 4.24 | 4.69 | 4.51 | 4.56 | 3.58 | 4.33 | 4.10 | 4.29      | 0.000         | 4.750         |
|                              | Rapid tests                    | 4.05 | 4.31 | 4.36 | 4.09 | 3.75 | 3.87 | 3.90 | 4.05      | 0.033         | 2.331         |
|                              | Physical exams                 | 4.08 | 4.40 | 4.45 | 4.16 | 3.83 | 3.87 | 4.30 | 4.15      | 0.015         | 2.691         |
|                              | Electrocardiogram              | 4.11 | 4.50 | 4.42 | 4.09 | 3.67 | 4.07 | 3.70 | 4.08      | 0.002         | 3.551         |
|                              | Vital parameters               | 4.24 | 4.53 | 4.60 | 4.28 | 3.67 | 4.13 | 4.20 | 4.24      | 0.001         | 4.080         |
|                              | $\bar{X}$                      | 4.17 | 4.47 | 4.46 | 4.22 | 3.65 | 4.05 | 4.23 | -         | -             | -             |

| Primary information category | Secondary information category                           | Mean |      |      |      |      |      |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|----------------------------------------------------------|------|------|------|------|------|------|------|-----------|---------------|---------------|
|                              |                                                          | Phar | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |               |               |
| PID_3 <sup>a)</sup>          | Vaccination and immunization                             | 4.58 | 4.57 | 4.69 | 4.22 | 4.17 | 4.00 | 3.90 | 4.30      | 0.000         | 5.672         |
|                              | Screenings                                               | 4.34 | 4.53 | 4.42 | 4.09 | 4.08 | 4.33 | 4.20 | 4.29      | 0.125         | 1.686         |
|                              | Diet                                                     | 4.24 | 4.24 | 4.42 | 4.06 | 3.83 | 4.07 | 4.70 | 4.22      | 0.058         | 2.066         |
|                              | Physical activity                                        | 4.24 | 4.24 | 4.28 | 4.16 | 3.83 | 3.87 | 4.50 | 4.16      | 0.328         | 1.160         |
|                              | Antimicrobial resistance                                 | 4.61 | 4.47 | 4.60 | 4.16 | 3.83 | 4.20 | 3.90 | 4.25      | 0.000         | 4.616         |
|                              | Smoking                                                  | 4.45 | 4.43 | 4.42 | 4.19 | 3.67 | 3.93 | 4.50 | 4.23      | 0.009         | 2.901         |
|                              | Epidemiology                                             | 4.29 | 4.21 | 4.34 | 4.13 | 3.83 | 3.87 | 4.00 | 4.09      | 0.246         | 1.326         |
|                              | $\bar{X}$                                                | 4.39 | 4.38 | 4.45 | 4.14 | 3.89 | 4.04 | 4.24 | -         | -             | -             |
| PID_4 <sup>a)</sup>          | Medicines                                                | 4.58 | 4.72 | 4.68 | 4.41 | 4.25 | 4.20 | 4.40 | 4.46      | 0.010         | 2.886         |
|                              | Pharmaceutical products                                  | 4.42 | 4.40 | 4.38 | 4.28 | 4.17 | 4.00 | 4.00 | 4.23      | 0.384         | 1.065         |
|                              | Medical consumables                                      | 4.08 | 4.16 | 4.25 | 3.84 | 3.42 | 3.53 | 3.70 | 3.85      | 0.004         | 3.326         |
|                              | Laboratory consumables                                   | 4.03 | 4.07 | 4.21 | 3.91 | 3.33 | 3.47 | 3.40 | 3.77      | 0.002         | 3.513         |
|                              | Drug interactions                                        | 4.61 | 4.59 | 4.57 | 4.28 | 4.00 | 4.20 | 3.90 | 4.31      | 0.007         | 3.046         |
|                              | Dosage                                                   | 4.58 | 4.60 | 4.61 | 4.38 | 3.83 | 3.53 | 4.20 | 4.25      | 0.000         | 6.804         |
|                              | Technical information about healthcare technologies      | 4.32 | 4.00 | 4.36 | 4.41 | 3.50 | 3.47 | 3.80 | 3.98      | 0.000         | 5.126         |
|                              | $\bar{X}$                                                | 4.37 | 4.36 | 4.44 | 4.21 | 3.79 | 3.77 | 3.91 | -         | -             | -             |
| PID_5 <sup>a)</sup>          | Access to emergency services                             | 4.24 | 4.40 | 4.48 | 3.94 | 3.92 | 4.40 | 3.90 | 4.18      | 0.008         | 2.951         |
|                              | Access to appointments                                   | 4.29 | 4.41 | 4.53 | 3.97 | 4.25 | 4.20 | 4.00 | 4.24      | 0.007         | 3.038         |
|                              | Access to treatments                                     | 4.37 | 4.40 | 4.48 | 3.97 | 4.00 | 4.00 | 3.80 | 4.14      | 0.002         | 3.511         |
|                              | Access to surgeries                                      | 4.29 | 4.34 | 4.42 | 3.94 | 3.83 | 4.27 | 3.80 | 4.13      | 0.027         | 2.421         |
|                              | $\bar{X}$                                                | 4.30 | 4.39 | 4.48 | 3.95 | 4.00 | 4.22 | 3.88 | -         | -             | -             |
| PID_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 4.00 | 3.91 | 3.96 | 3.94 | 3.17 | 3.67 | 3.40 | 3.72      | 0.129         | 1.668         |
|                              | Cost with medicines                                      | 4.08 | 4.05 | 3.98 | 3.94 | 3.25 | 3.60 | 3.40 | 3.76      | 0.060         | 2.044         |
|                              | Cost with pharmaceutical products                        | 3.97 | 3.88 | 3.95 | 3.88 | 3.17 | 3.47 | 3.30 | 3.66      | 0.068         | 1.988         |
|                              | Cost with medical consumables                            | 3.79 | 3.81 | 3.93 | 3.78 | 3.17 | 3.60 | 3.30 | 3.63      | 0.162         | 1.552         |
|                              | Cost with laboratory consumables                         | 3.82 | 3.74 | 3.92 | 3.72 | 3.17 | 3.60 | 3.30 | 3.61      | 0.178         | 1.500         |
|                              | Cost with human resources                                | 3.82 | 3.79 | 3.96 | 3.78 | 3.17 | 3.53 | 3.20 | 3.61      | 0.089         | 1.855         |
|                              | $\bar{X}$                                                | 3.91 | 3.86 | 3.95 | 3.84 | 3.18 | 3.58 | 3.32 | -         | -             | -             |
| PID_7 <sup>a)</sup>          | Average time of appointment                              | 3.79 | 3.93 | 4.08 | 3.53 | 3.58 | 3.60 | 3.90 | 3.77      | 0.087         | 1.865         |
|                              | Average time of treatment                                | 3.92 | 3.97 | 4.08 | 3.56 | 3.67 | 3.47 | 3.80 | 3.78      | 0.068         | 1.984         |
|                              | Average time of waiting                                  | 3.87 | 4.02 | 4.14 | 3.63 | 3.75 | 3.53 | 4.00 | 3.85      | 0.060         | 2.046         |
|                              | Average time of management and administration            | 3.76 | 3.91 | 4.05 | 3.56 | 3.75 | 3.60 | 3.40 | 3.72      | 0.082         | 1.894         |
|                              | $\bar{X}$                                                | 3.84 | 3.96 | 4.08 | 3.57 | 3.69 | 3.55 | 3.78 | -         | -             | -             |

a) 5-Likert importance scale: 1 - Not important at all; 2 - Not very important; 3 - Moderately important; 4 - Important; 5 - Very important

#### 4.5.3. Patients by age group analysis

Patients provided their opinion about the importance of selected healthcare data to improve healthcare provision. According to Table 25 (standard deviation values available on Annex XXV), the patients' evaluation about the importance of selected healthcare data was, on average, more positive than the one about the utility (Table 22). The first five PIDs achieved a higher average level of importance when compared with the last two constructs about costs and temporal resources (PID\_6 and PID\_7). Pathologies, clinical and family history, and allergies and intolerances categories were recognized to be important or very important by more than 74% of patients (see Annex XXVI), being the top categories in PID\_1. Regarding PID\_2, more than 75% of patients, on average, viewed as important to very important the data about laboratory tests, imaging exams, physical exams, electrocardiogram data, and vital parameters. Likewise, data about screenings and vaccination and immunization reported the same results within PID\_3. The fourth construct results demonstrated that patients thought that medicines data, along with drug interactions and dosage data were highly important for healthcare systems (on average, above 73% believed data to be as being important or very important, see Annex XXVI). The four categories within PID\_5 obtained identical results, with around 75% to 76% of patients thinking these data to be important to very important. Analyzing cost importance for patients, three categories obtained, on average, the following important to very important highest classification (see Annex XXVI): (1) cost with medicines (67.27%); (2) costs with complementary diagnostic and therapeutic exams (64.08%) and (3) cost with pharmaceutical products (64.07%). For the final construct (PID\_7), the average time of appointment, treatment, and waiting were viewed, on average, as being important or very important by around 67% of patients, making them the most important categories within the construct. The age group 25 to 34 registered the highest average value for PID\_1, PID\_2, PID\_6, and PID\_7 while the 19 to 24 years old patients were, on average, more positive about PID\_3, PID\_4, and PID\_5.

Table 25. Patients' perspectives by age group about healthcare data importance: average and one-way ANOVA results

| Primary information category | Secondary information category                      | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|-----------------------------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                              |                                                     | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
| PID_1 <sup>a)</sup>          | Allergies and intolerances                          | 3.33 | 4.42    | 4.54    | 4.29    | 4.11    | 4.11    | 4.09 | 4.13      | 0.108         | 1.752         |
|                              | Demography                                          | 3.33 | 3.79    | 3.88    | 3.95    | 3.54    | 3.49    | 3.42 | 3.63      | 0.023         | 2.486         |
|                              | Pregnancy                                           | 3.33 | 4.16    | 4.50    | 4.21    | 3.92    | 3.79    | 3.79 | 3.96      | 0.003         | 3.301         |
|                              | Habits                                              | 3.33 | 4.05    | 4.02    | 4.05    | 3.76    | 3.70    | 3.61 | 3.79      | 0.103         | 1.775         |
|                              | Clinical and family history                         | 3.33 | 4.26    | 4.50    | 4.29    | 4.03    | 4.13    | 4.00 | 4.08      | 0.079         | 1.903         |
|                              | Identification                                      | 3.33 | 4.00    | 4.29    | 4.17    | 3.96    | 3.77    | 3.88 | 3.92      | 0.092         | 1.831         |
|                              | Death                                               | 3.33 | 4.05    | 4.25    | 4.05    | 3.71    | 3.59    | 3.76 | 3.82      | 0.013         | 2.733         |
|                              | Pathologies                                         | 3.33 | 4.42    | 4.56    | 4.35    | 4.10    | 4.00    | 4.03 | 4.11      | 0.019         | 2.564         |
| $\bar{X}$                    |                                                     | 3.33 | 4.14    | 4.32    | 4.17    | 3.89    | 3.82    | 3.82 | -         | -             | -             |
| PID_2 <sup>a)</sup>          | Anthropometric evaluation                           | 3.33 | 4.00    | 4.10    | 3.95    | 3.89    | 3.73    | 3.42 | 3.78      | 0.105         | 1.765         |
|                              | Laboratory tests                                    | 3.33 | 4.37    | 4.54    | 4.29    | 4.10    | 4.07    | 3.94 | 4.09      | 0.038         | 2.251         |
|                              | Imaging exams                                       | 3.33 | 4.26    | 4.56    | 4.28    | 4.11    | 4.06    | 4.00 | 4.09      | 0.052         | 2.106         |
|                              | Rapid tests                                         | 3.33 | 4.05    | 4.33    | 4.16    | 4.04    | 3.94    | 3.82 | 3.95      | 0.205         | 1.421         |
|                              | Physical exams                                      | 3.33 | 4.32    | 4.37    | 4.19    | 4.07    | 4.00    | 3.76 | 4.00      | 0.081         | 1.889         |
|                              | Electrocardiogram                                   | 3.33 | 4.21    | 4.56    | 4.27    | 4.12    | 4.08    | 3.91 | 4.07      | 0.036         | 2.274         |
|                              | Vital parameters                                    | 3.33 | 4.37    | 4.42    | 4.25    | 4.12    | 4.07    | 3.82 | 4.05      | 0.079         | 1.903         |
| $\bar{X}$                    |                                                     | 3.33 | 4.23    | 4.41    | 4.20    | 4.06    | 3.99    | 3.81 | -         | -             | -             |
| PID_3 <sup>a)</sup>          | Vaccination and immunization                        | 3.33 | 4.32    | 4.48    | 4.25    | 4.14    | 4.07    | 4.15 | 4.10      | 0.273         | 1.263         |
|                              | Screenings                                          | 3.33 | 4.42    | 4.37    | 4.25    | 4.11    | 4.10    | 4.06 | 4.09      | 0.407         | 1.027         |
|                              | Diet                                                | 3.33 | 4.21    | 4.12    | 3.93    | 3.85    | 3.83    | 3.79 | 3.86      | 0.494         | 0.901         |
|                              | Physical activity                                   | 3.33 | 4.21    | 4.00    | 3.89    | 3.84    | 3.82    | 3.82 | 3.84      | 0.728         | 0.603         |
|                              | Antimicrobial resistance                            | 3.33 | 4.16    | 4.33    | 4.18    | 4.00    | 3.99    | 4.03 | 4.00      | 0.406         | 1.029         |
|                              | Smoking                                             | 3.33 | 4.32    | 4.17    | 4.06    | 3.81    | 3.66    | 3.94 | 3.90      | 0.042         | 2.200         |
|                              | Epidemiology                                        | 3.33 | 4.32    | 4.38    | 4.19    | 4.04    | 3.92    | 3.94 | 4.02      | 0.119         | 1.701         |
| $\bar{X}$                    |                                                     | 3.33 | 4.28    | 4.26    | 4.11    | 3.97    | 3.91    | 3.96 | -         | -             | -             |
| PID_4 <sup>a)</sup>          | Medicines                                           | 3.33 | 4.53    | 4.52    | 4.40    | 4.14    | 3.96    | 3.91 | 4.11      | 0.004         | 3.255         |
|                              | Pharmaceutical products                             | 3.33 | 4.32    | 4.21    | 4.21    | 3.96    | 3.77    | 3.79 | 3.94      | 0.039         | 2.241         |
|                              | Medical consumables                                 | 3.33 | 4.32    | 3.94    | 3.98    | 3.77    | 3.59    | 3.76 | 3.81      | 0.111         | 1.736         |
|                              | Laboratory consumables                              | 3.33 | 4.11    | 3.94    | 3.98    | 3.76    | 3.59    | 3.76 | 3.78      | 0.240         | 1.336         |
|                              | Drug interactions                                   | 3.33 | 4.37    | 4.21    | 4.19    | 4.02    | 3.89    | 3.94 | 3.99      | 0.256         | 1.299         |
|                              | Dosage                                              | 3.33 | 4.37    | 4.40    | 4.25    | 4.05    | 3.94    | 3.94 | 4.04      | 0.084         | 1.874         |
|                              | Technical information about healthcare technologies | 3.33 | 4.21    | 4.12    | 4.06    | 3.89    | 3.75    | 3.67 | 3.86      | 0.188         | 1.467         |
| $\bar{X}$                    |                                                     | 3.33 | 4.32    | 4.19    | 4.15    | 3.94    | 3.78    | 3.82 | -         | -             | -             |
| PID_5 <sup>a)</sup>          | Access to emergency services                        | 3.33 | 4.47    | 4.38    | 4.22    | 4.14    | 4.00    | 4.03 | 4.08      | 0.254         | 1.303         |
|                              | Access to appointments                              | 3.33 | 4.42    | 4.33    | 4.27    | 4.14    | 4.03    | 4.06 | 4.08      | 0.347         | 1.125         |
|                              | Access to treatments                                | 3.33 | 4.37    | 4.46    | 4.25    | 4.14    | 4.01    | 4.12 | 4.10      | 0.197         | 1.443         |

| Primary information category | Secondary information category                           | Mean |         |         |         |         |         |      |           | ANOVA p-value | ANOVA F-value |
|------------------------------|----------------------------------------------------------|------|---------|---------|---------|---------|---------|------|-----------|---------------|---------------|
|                              |                                                          | ≤ 18 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65 | $\bar{X}$ |               |               |
|                              | Access to surgeries                                      | 3.33 | 4.53    | 4.38    | 4.26    | 4.12    | 4.00    | 4.12 | 4.11      | 0.180         | 1.490         |
|                              | $\bar{X}$                                                | 3.33 | 4.45    | 4.39    | 4.25    | 4.14    | 4.01    | 4.08 | -         | -             | -             |
| PID_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 3.33 | 3.89    | 4.13    | 4.00    | 3.67    | 3.62    | 3.58 | 3.75      | 0.044         | 2.184         |
|                              | Cost with medicines                                      | 3.33 | 4.11    | 4.35    | 4.03    | 3.76    | 3.61    | 3.55 | 3.82      | 0.002         | 3.504         |
|                              | Cost with pharmaceutical products                        | 3.33 | 3.89    | 4.27    | 3.95    | 3.73    | 3.49    | 3.55 | 3.75      | 0.004         | 3.251         |
|                              | Cost with medical consumables                            | 3.33 | 4.00    | 4.04    | 3.77    | 3.59    | 3.56    | 3.52 | 3.69      | 0.177         | 1.500         |
|                              | Cost with laboratory consumables                         | 3.33 | 3.95    | 4.00    | 3.76    | 3.59    | 3.56    | 3.52 | 3.67      | 0.274         | 1.262         |
|                              | Cost with human resources                                | 3.33 | 3.95    | 3.98    | 3.81    | 3.64    | 3.58    | 3.52 | 3.69      | 0.350         | 1.120         |
|                              | $\bar{X}$                                                | 3.33 | 3.96    | 4.13    | 3.89    | 3.66    | 3.57    | 3.54 | -         | -             | -             |
| PID_7 <sup>a)</sup>          | Average time of appointment                              | 3.33 | 4.21    | 4.00    | 4.01    | 3.82    | 3.72    | 3.64 | 3.82      | 0.281         | 1.247         |
|                              | Average time of treatment                                | 3.33 | 4.05    | 4.13    | 4.09    | 3.84    | 3.73    | 3.73 | 3.84      | 0.169         | 1.523         |
|                              | Average time of waiting                                  | 3.33 | 3.95    | 4.21    | 4.13    | 3.78    | 3.70    | 3.73 | 3.83      | 0.043         | 2.193         |
|                              | Average time of management and administration            | 3.33 | 3.89    | 3.98    | 3.99    | 3.67    | 3.52    | 3.61 | 3.71      | 0.093         | 1.824         |
|                              | $\bar{X}$                                                | 3.33 | 4.03    | 4.08    | 4.05    | 3.78    | 3.67    | 3.67 | -         | -             | -             |

a) 5-Likert importance scale: 1 - Not important at all; 2 - Not very important; 3 - Moderately important; 4 - Important; 5 - Very important

Contrasting with the PUD one-way ANOVA analysis (Table 22), almost all PID constructs achieved significant one-way ANOVA results at a 5% significance level (Table 25). The only one which did not produce any significant result was PID\_5. For PID\_1, data about demography (p-value: 0.023; F: 2.486), pregnancy (p-value: 0.003; F: 3.301), death (p-value: 0.013; F: 2.733) and pathologies (p-value: 0.019; F: 2.564) suggested differences in the means among the age groups. Laboratory tests (p-value: 0.019; F: 2.564) and electrocardiogram (p-value: 0.036; F: 2.274) data are the only two significant results within the diagnostic and evaluation of patients' health construct (PID\_2). Smoking data (p-value: 0.042; F: 2.200) was the only meaningful result for PID\_3. Medicines (p-value: 0.004; F: 3.255) and pharmaceutical products (p-value: 0.039; F: 2.241) compose the meaningful categories in the patients' treatments construct (PID\_4). In PID\_6, the cost with complementary diagnostic and therapeutic exams (p-value: 0.044; F: 2.184), the cost with medicines (p-value: 0.002; F: 3.504) and the cost with pharmaceutical products (p-value: 0.004; F: 3.251) were significant while the average time of waiting (p-value: 0.043; F: 2.193) stands alone within PID\_7. According to the Tukey HSD analysis, pregnancy data were viewed differently between the 25 to 34 years old and the patients 45 to 64 years old. Death data were perceived differently

between the 25 to 34 years old patients and the ones aged between 55 to 64. The cost of medicines was also viewed differently between the 25 to 34 years old and patients above 44 years, while the cost of pharmaceutical products was differently perceived between the 25 to 34 and the 55 to 64 age groups. All the other nine categories which were significant through the one-way ANOVA produced non-significant results through the Tukey analysis.

## **4.6. PLS-SEM's generated data analysis**

### **4.6.1. Healthcare professionals analysis**

The collected survey data was used to conduct a PLS-SEM algorithm analysis through a reflective model. According to Hair et al. (2021), a reflective model assessment begins with indicator reliability, followed by constructs assessment (internal consistency reliability of constructs, convergent validity, and discriminant validity). The outer loading analysis was performed by considering a minimum value of 0.600. It was within the range of accepted values if the consistency and convergent validity criteria were assured (Hair et al., 2021; Rasoolimanesh & Ali, 2018). According to Annex XXVII, all TAM's components achieved outer loading values superior to 0.707, following criteria defined by Hair et al. (2019), Benitez et al. (2020), and Hair et al. (2021). ASU and BIU constructs achieved the highest average outer loading values, while ATU constructs registered the lowest average value. ATU\_6 obtained the lowest indicator value and ASU\_2 the highest. For PBDA, only the lack of adequate infrastructure (PBDA\_4) and technical interoperability (PBDA\_6) achieved equivalent values. The other barriers were removed to increase the validity and reliability of the model ( $AVE \geq 0.5$ ). As for the PUD and PID constructs, an average value of the outer loadings was calculated for each one (see Annex XXVII and Annex XXVIII for more details). The highest average outer loading values were achieved by PID\_2 and PUD\_3, with electrocardiogram and antimicrobial resistance registering the highest outer loading values in each respective construct. Using Table 26, Cronbach's alpha and  $\rho_A$  values were considered acceptable, surpassing the minimum value of 0.7 (Benitez et al., 2020; Cheung et al., 2023; Hair et al., 2019). However, Hair et al. (2019) and Hair et al. (2021) further stated that values above 0.95 may cause indicator redundancy, which would jeopardize content validity (PID, PUD,

and ASU are above the threshold). In contradiction, Taber (2017), found that some authors defined Cronbach's alpha value of 0.98 as acceptable, demonstrating a lack of consensus about this matter. The average variance extracted conforms with the values stated in the literature, namely values  $\geq 0.5$  for convergent validity (Benitez et al., 2020; Hair et al., 2019). According to Table 26, the criterion  $R^2$  was also assessed to evaluate construct quality. According to Hair et al. (2019), the degree of variance explained in ATU and BIU is considered between moderate and weak while PU and ASU are weak and very weak, respectively. For the highest results, 41% of the variance in BIU is explained by PU, ATU, and PID, while 35% of the variance in ATU is explained by PU, PEU and PBDA. For the lower results, 26.30% of the variance in PU is explained by PEU and PUD while only 10.40% of the variance in ASU is explained by BIU. As for weak values, Benitez et al. (2020) stated that a low  $R^2$  may be acceptable when the underlying causality is not very well known.

Table 26. Healthcare professionals' PLS-SEM construct quality assessment

| Constructs | r-square ( $R^2$ ) | Cronbach's alpha | Composite reliability ( $\rho_A$ ) | Average variance extracted (AVE) |
|------------|--------------------|------------------|------------------------------------|----------------------------------|
| ATU        | 0.350              | 0.888            | 0.893                              | 0.643                            |
| BIU        | 0.410              | 0.895            | 0.902                              | 0.905                            |
| PBDA       | -                  | 0.775            | 0.788                              | 0.816                            |
| PID        | -                  | 0.964            | 0.975                              | 0.500                            |
| PEU        | -                  | 0.870            | 0.885                              | 0.605                            |
| PU         | 0.263              | 0.920            | 0.928                              | 0.717                            |
| ASU        | 0.104              | 0.971            | 0.972                              | 0.972                            |
| PUD        | -                  | 0.977            | 0.981                              | 0.524                            |

The evaluation of the pathway's validity was performed by a heterotrait-monotrait ratio (HTMT) matrix analysis (see Table 27). According to the data obtained, values were between 0.644 (PUD <-> PID) and 0.070 (PUD <-> PBDA) meaning that discriminant validity is assured, as the values are below 0.85 or 0.90 (Benitez et al., 2020; Hair et al., 2021; Hair et al., 2019). In this way, the quality of this reflective model is assured in terms of its reliability and validity, as proposed by Hair et al. (2021).

Table 27. Healthcare professionals' heterotrait-monotrait ratio (HTMT) matrix

| Constructs | ATU   | BIU   | PBDA  | PID   | PEU   | PU    | ASU   |
|------------|-------|-------|-------|-------|-------|-------|-------|
| BIU        | 0.632 |       |       |       |       |       |       |
| PBDA       | 0.137 | 0.130 |       |       |       |       |       |
| PID        | 0.152 | 0.183 | 0.091 |       |       |       |       |
| PEU        | 0.542 | 0.472 | 0.320 | 0.122 |       |       |       |
| PU         | 0.571 | 0.581 | 0.165 | 0.117 | 0.540 |       |       |
| ASU        | 0.206 | 0.344 | 0.161 | 0.163 | 0.150 | 0.218 |       |
| PUD        | 0.186 | 0.176 | 0.070 | 0.644 | 0.207 | 0.179 | 0.113 |

To verify the quality of the pathway's quality, path coefficients and VIF values were verified. According to Mohamed et al. (2018), path coefficients near 0.5, 0.3, and 0.1 have large, medium, and small effect sizes, respectively. In this way, and according to Table 28, only one path coefficient has a large effect (PEU -> PU) and three have a small effect (PBDA -> ATU; PUD -> PU; PID -> BIU). The other five path coefficients possess a medium effect. As for VIF values, all values were below the threshold of 3 defined by Hair et al. (2019), meaning that non-collinearity issues existed within the pathways.

Table 28. Healthcare professionals' PLS-SEM pathway quality assessment and hypotheses testing

| Model pathways | Path coefficients | VIF   | Standard deviation | T-statistics | P-values | Hypotheses | Decision                    |
|----------------|-------------------|-------|--------------------|--------------|----------|------------|-----------------------------|
| PEU -> PU      | 0.487             | 1.040 | 0.049              | 9.976        | 0.000    | H1         | Supported <sup>a); b)</sup> |
| PEU -> ATU     | 0.314             | 1.417 | 0.062              | 5.054        | 0.000    | H2         | Supported <sup>a); b)</sup> |
| PU -> ATU      | 0.373             | 1.343 | 0.059              | 6.283        | 0.000    | H3         | Supported <sup>a); b)</sup> |
| PU -> BIU      | 0.311             | 1.389 | 0.069              | 4.517        | 0.000    | H4         | Supported <sup>a); b)</sup> |
| ATU -> BIU     | 0.395             | 1.399 | 0.084              | 4.716        | 0.000    | H5         | Supported <sup>a); b)</sup> |
| BIU -> ASU     | 0.322             | 1.000 | 0.068              | 4.751        | 0.000    | H6         | Supported <sup>a); b)</sup> |
| PBDA -> ATU    | 0.021             | 1.076 | 0.048              | 0.44         | 0.660    | H7         | Not supported <sup>b)</sup> |
| PUD -> PU      | 0.091             | 1.040 | 0.049              | 1.882        | 0.060    | H8         | Not supported <sup>b)</sup> |
| PID -> BIU     | 0.100             | 1.021 | 0.059              | 1.693        | 0.091    | H9         | Not supported <sup>b)</sup> |

a) Level of significance of 1%

b) Level of significance of 5%

The nine hypotheses previously defined in the introduction were also evaluated to verify their significance. According to data from Table 28 all pathways from TAM were

considered meaningful at a significance level of 5% and even 1% (H1 to H6). The hypotheses associated with the new constructs PBDA, PUD, and PID (H7, H8, and H9) were considered non-significant as their p-value was superior to 0.05.

#### 4.6.2. Patients analysis

Patients' perspectives collected during the survey were also analysed using the PLS-SEM algorithm to produce a reflective model and using the same criteria for the healthcare professionals analysis. The reflective model produced is shown in Annex XXIX. According to it, outer loadings associated with the technology acceptance model registered values above the 0.707 threshold defined by Hair et al. (2019), Benitez et al. (2020), and Hair et al. (2021). The highest average outer loading values were associated with ASU and BIU constructs, whereas the ATU construct obtained the lowest average. BIU\_1 and BIU\_2 (0.971) presented the highest indicator value while ATU\_1 registered the lowest (0.805). For PBDA, only the heterogeneity of electronic health records (PBDA\_1) was accepted into the model because other barriers decreased the model's validity and reliability by decreasing the value of AVE below 0.5. According to Annex XXIX and Annex XXX, PUD and PID indicators were calculated as the average value of the respective outer loadings. The highest average value was achieved by PID\_2 (0.891) and PUD\_2 (0.883). The vital parameters (0.898) of PID\_2 and physical exams (0.895) of PUD\_2 are among the highest outer loadings within each construct associated with the importance and utility evaluation. No information categories were removed from the utility and importance constructs as they were above the 0.600 threshold.

Table 29. Patients' PLS-SEM construct quality assessment

| Constructs | r-square ( $R^2$ ) | Cronbach's alpha | Composite reliability ( $\rho_A$ ) | Average variance extracted (AVE) |
|------------|--------------------|------------------|------------------------------------|----------------------------------|
| ATU        | 0.445              | 0.945            | 0.947                              | 0.785                            |
| BIU        | 0.615              | 0.939            | 0.939                              | 0.943                            |
| PBDA       | -                  | -                | -                                  | -                                |
| PID        | -                  | 0.991            | 0.992                              | 0.725                            |
| PEU        | -                  | 0.947            | 0.953                              | 0.790                            |
| PU         | 0.467              | 0.953            | 0.954                              | 0.810                            |
| ASU        | 0.020              | 0.896            | 0.901                              | 0.906                            |
| PUD        | -                  | 0.989            | 0.990                              | 0.696                            |

According to Table 29, Cronbach's alpha and  $\rho_A$  values were considered acceptable, as they were greater than the value of 0.7 (Benitez et al., 2020; Cheung et al., 2023; Hair et al., 2019). Hair et al. (2019) and Hair et al. (2021) noted that values above 0.95 may cause indicator redundancy, which would compromise content validity (PID, PUD, and PU are above the threshold). On the other hand, Taber (2017) demonstrated a lack of consensus on this matter in several studies because some authors defined Cronbach's alpha value above 0.95 as acceptable. The average variance extracted within the reflective model followed the values stated in the literature, namely values  $\geq 0.5$  for convergent validity (Benitez et al., 2020; Hair et al., 2019). The criterion  $R^2$  was also assessed to verify construct quality. According to Hair et al. (2019), the degree of variance explained in BIU, PU, and ATU is considered to be between substantial to moderate while ASU is shown to be very weak. BIU's variance (61.5%) is explained by PU, ATU, and PUD. 46.70% of the variance registered on PU is explained by PEU and PUD while 44.50% of the variance in ATU is explained by PU, PEU, PBDA, PUD, and PID. Only 2% of ASU's variance is explained by BIU.

The heterotrait-monotrait ratio (HTMT) matrix analysis (see Table 30) registered values between 0.863 (PUD  $\leftrightarrow$  PID) and 0.039 (ASU  $\leftrightarrow$  PBDA) meaning that discriminant validity is assured, as the values are below the accepted values of 0.85 or 0.90 reported on the literature (Benitez et al., 2020; Hair et al., 2021; Hair et al., 2019). According to Hair et al. (2021) and the data analyzed, the reflective model's reliability and validity were proven to be present.

Table 30. Patients' heterotrait-monotrait ratio (HTMT) matrix

| Constructs | ATU   | BIU   | PBDA  | PID   | PEU   | PU    | ASU   |
|------------|-------|-------|-------|-------|-------|-------|-------|
| BIU        | 0.768 |       |       |       |       |       |       |
| PBDA       | 0.208 | 0.186 |       |       |       |       |       |
| PID        | 0.415 | 0.374 | 0.142 |       |       |       |       |
| PEU        | 0.549 | 0.636 | 0.086 | 0.193 |       |       |       |
| PU         | 0.586 | 0.675 | 0.230 | 0.257 | 0.689 |       |       |
| ASU        | 0.080 | 0.153 | 0.039 | 0.049 | 0.273 | 0.190 |       |
| PUD        | 0.488 | 0.468 | 0.190 | 0.863 | 0.267 | 0.347 | 0.053 |

Path coefficients and VIF values were also verified to analyze the quality of relationships between constructs. According to Mohamed et al. (2018), path coefficients

around 0.5 have a large effect size while 0.3 and 0.1 possess medium and small effect sizes, respectively. According to Table 31, two path coefficients can be considered to have a large effect (PEU → PU and ATU → BIU) while five exerted a small effect (PBDA → ATU; PUD → BI; PID → ATU; PUD → PU; BIU → ASU). The other remaining four path coefficients were revealed to have a medium effect. Nine VIF values fell within the threshold of 3 defined by Hair et al. (2019), meaning that there were no collinearity issues. However, for PUD → ATU and PID → ATU values were above 3 suggesting that there may exist a possibility for collinearity issues (Hair et al., 2019).

Table 31. Patients' PLS-SEM pathway quality assessment and hypotheses testing

| Model pathways | Path coefficients | VIF   | Standard deviation | T-statistics | P-values | Hypotheses | Decision                    |
|----------------|-------------------|-------|--------------------|--------------|----------|------------|-----------------------------|
| PEU → PU       | 0.616             | 1.073 | 0.034              | 18.023       | 0.000    | H1         | Supported <sup>a); b)</sup> |
| PEU → ATU      | 0.261             | 1.801 | 0.050              | 5.241        | 0.000    | H2         | Supported <sup>a); b)</sup> |
| PU → ATU       | 0.272             | 1.951 | 0.054              | 5.007        | 0.000    | H3         | Supported <sup>a); b)</sup> |
| PU → BIU       | 0.328             | 1.468 | 0.049              | 6.665        | 0.000    | H4         | Supported <sup>a); b)</sup> |
| ATU → BIU      | 0.488             | 1.681 | 0.054              | 9.074        | 0.000    | H5         | Supported <sup>a); b)</sup> |
| BIU → ASU      | 0.140             | 1.000 | 0.048              | 2.898        | 0.004    | H6         | Supported <sup>a); b)</sup> |
| PBDA → ATU     | 0.063             | 1.079 | 0.046              | 1.360        | 0.174    | H7         | Not supported <sup>b)</sup> |
| PUD → PU       | 0.177             | 1.073 | 0.038              | 4.662        | 0.000    | H8         | Supported <sup>a); b)</sup> |
| PUD → ATU      | 0.247             | 3.993 | 0.074              | 3.331        | 0.001    | H9         | Supported <sup>a); b)</sup> |
| PUD → BIU      | 0.112             | 1.305 | 0.038              | 2.916        | 0.004    | H10        | Supported <sup>a); b)</sup> |
| PID → ATU      | 0.066             | 3.739 | 0.072              | 0.920        | 0.358    | H11        | Not supported <sup>b)</sup> |

a) Level of significance of 1%

b) Level of significance of 5%

The hypothesis testing reproduced in Table 31 demonstrated that from the 11 hypotheses evaluated, 9 were considered significant while only 2 were not supported by the findings. The pathways associated with the technology acceptance model were considered meaningful at a significance level of 5% and even 1% (H1 to H6). The three hypotheses associated with the new construct PUD (H8, H9, and H10) were considered significant as their p-values were inferior to 0.05 and 0.01. H7 and H11 did not produce statistically significant results.

#### 4.6.3. Overseeing healthcare stakeholders analysis

The perspectives of overseeing healthcare stakeholders (administrators, managers and policymakers), provided through the online survey, were examined by a PLS-SEM reflective model, in accordance with the methodology used for healthcare professionals and patients. Consequently, a reflective model was constructed and reproduced in Annex XXXI. According to this figure, almost all outer loadings associated with the technology acceptance model obtained values over the 0.707 defined by Hair et al. (2019), Benitez et al. (2020), and Hair et al. (2021), except for PEU\_6 which only achieved the value of 0.667. ASU and BIU constructs obtained the higher average outer loading values, whereas the PEU construct attained the lowest average score. ASU\_1 and ASU\_2 (0.990) presented the highest indicator value while PEU\_6 registered the lowest (as mentioned previously). Annex XXXI also indicates that the model's PBDA construct was based on four barriers, namely data privacy risks (PBDA\_2), legal restrictions (PBDA\_3), lack of adequate infrastructure (PBDA\_4), and cybersecurity risks (PBDA\_5). Other indicators related to PBDA were removed as they decreased the model's validity and reliability by reducing the value of AVE below 0.5. PUD and PID indicators in the reflective model in Annex XXXI were based on the average value of the respective outer loadings (see Annex XXXII). "Prevention and promotion of patients' health" (PUD\_3) and "diagnostic and evaluation of patients' health" (PID\_2) achieved the highest average indicator values (0.869 and 0.870, respectively). PID\_3's antimicrobial resistance (0.914) and PUD\_4's drug interactions (0.895) of PUD\_2 are the highest outer loadings within the overall utility and importance of constructs. PUD\_6 and PUD\_7 were not represented in the model as they had only outer loadings inferior to 0.600. PID\_1, PID\_6, PID\_7, PUD\_1, and PUD\_4 had some information categories removed for the same reason (see Annex XXXII).

Table 32. Overseeing healthcare stakeholders' PLS-SEM construct quality assessment

| Constructs | r-square ( $R^2$ ) | Cronbach's alpha | Composite reliability ( $\rho_A$ ) | Average variance extracted (AVE) |
|------------|--------------------|------------------|------------------------------------|----------------------------------|
| ATU        | 0.613              | 0.921            | 0.929                              | 0.720                            |
| BIU        | 0.771              | 0.924            | 0.924                              | 0.929                            |
| PBDA       | -                  | 0.789            | 0.832                              | 0.601                            |
| PID        | -                  | 0.984            | 0.989                              | 0.643                            |
| PEU        | -                  | 0.869            | 0.911                              | 0.593                            |

| Constructs | r-square ( $R^2$ ) | Cronbach's alpha | Composite reliability ( $\rho_A$ ) | Average variance extracted (AVE) |
|------------|--------------------|------------------|------------------------------------|----------------------------------|
| PU         | 0.516              | 0.953            | 0.957                              | 0.812                            |
| ASU        | 0.141              | 0.980            | 0.980                              | 0.981                            |
| PUD        | -                  | 0.979            | 0.986                              | 0.642                            |

Cronbach's alpha and  $\rho_A$  values displayed in Table 32 were acceptable, as no value was inferior to 0.7 (Benitez et al., 2020; Cheung et al., 2023; Hair et al., 2019). On the other hand, Hair et al. (2019) and Hair et al. (2021) indicator redundancy can be associated with values above 0.95, affecting the validity of PID, PUD, PU, and ASU constructs within the model. However, a study by Taber (2017) found that Cronbach's alpha value was above 0.95 was being used in the literature, which indicated a low level of consensus on the matter. The AVE values above the 0.5 threshold indicated that the reflective model achieved convergent validity (Benitez et al., 2020; Hair et al., 2019). The  $R^2$  indicator was also used to assess the internal quality of constructs. As explained by Hair et al. (2019), the variance of the model's constructs can be categorized on several levels: (1) substantial (ATU and BIU); (2) moderate (PU), and (3) weak (ASU).

The discriminant validity of the reflective model was obtained as the highest value within the heterotrait-monotrait ratio (HTMT) matrix analysis (see Table 33) was 0.900 (BIU <-> ATU) which is the maximum threshold defined by some authors (Benitez et al., 2020; Hair et al., 2021; Hair et al., 2019). In this way, the produced data allowed to check reliability and validity, confirming their presence in the PLS-SEM model in the eyes of Hair et al. (2021).

Table 33. Overseeing healthcare stakeholders' heterotrait-monotrait ratio (HTMT) matrix

| Constructs | ATU   | BIU   | PBDA  | PID   | PEU   | PU    | ASU   |
|------------|-------|-------|-------|-------|-------|-------|-------|
| BIU        | 0.900 |       |       |       |       |       |       |
| PBDA       | 0.259 | 0.139 |       |       |       |       |       |
| PID        | 0.445 | 0.462 | 0.284 |       |       |       |       |
| PEU        | 0.680 | 0.657 | 0.292 | 0.205 |       |       |       |
| PU         | 0.771 | 0.824 | 0.213 | 0.330 | 0.652 |       |       |
| ASU        | 0.258 | 0.394 | 0.177 | 0.301 | 0.199 | 0.491 |       |
| PUD        | 0.388 | 0.428 | 0.226 | 0.621 | 0.181 | 0.389 | 0.211 |

Another important analysis is the quality of constructs' interconnections assessment through path coefficients and VIF values. Path coefficients can possess different effect sizes according to their values: large effect ( $\pm 0.5$ ), medium effect ( $\pm 0.3$ ), and small effect ( $\pm 0.1$ ) (Mohamed et al., 2018). Thus, through Table 34, path coefficients obtained can be classified in the following manner: (1) large effect (PEU  $\rightarrow$  PU, ATU  $\rightarrow$  BIU and PU  $\rightarrow$  ATU); (2) medium effect (BIU  $\rightarrow$  ASU, PU  $\rightarrow$  BIU, PEU  $\rightarrow$  ATU and PUD  $\rightarrow$  PU) and (3) small effect (PID  $\rightarrow$  BIU and PBDA  $\rightarrow$  ATU). Collinearity concerns were excluded from the reflective model as VIF values reported in Table 34 were inferior to 3, as preconized by Hair et al. (2019).

Table 34. Overseeing healthcare stakeholders' PLS-SEM pathway quality assessment and hypotheses testing

| Model pathways         | Path coefficients | VIF   | Standard deviation | T-statistics | P-values | Hypotheses | Decision                    |
|------------------------|-------------------|-------|--------------------|--------------|----------|------------|-----------------------------|
| PEU $\rightarrow$ PU   | 0.606             | 1.016 | 0.108              | 5.590        | 0.000    | H1         | Supported <sup>a); b)</sup> |
| PEU $\rightarrow$ ATU  | 0.348             | 1.748 | 0.101              | 3.450        | 0.001    | H2         | Supported <sup>a); b)</sup> |
| PU $\rightarrow$ ATU   | 0.492             | 1.722 | 0.111              | 4.419        | 0.000    | H3         | Supported <sup>a); b)</sup> |
| PU $\rightarrow$ BIU   | 0.353             | 2.142 | 0.114              | 3.107        | 0.002    | H4         | Supported <sup>a); b)</sup> |
| ATU $\rightarrow$ BIU  | 0.529             | 2.324 | 0.124              | 4.259        | 0.000    | H5         | Supported <sup>a); b)</sup> |
| BIU $\rightarrow$ ASU  | 0.376             | 1.000 | 0.104              | 3.605        | 0.000    | H6         | Supported <sup>a); b)</sup> |
| PBDA $\rightarrow$ ATU | 0.069             | 1.058 | 0.146              | 0.475        | 0.635    | H7         | Not supported <sup>b)</sup> |
| PUD $\rightarrow$ PU   | 0.317             | 1.016 | 0.101              | 3.132        | 0.002    | H8         | Supported <sup>a); b)</sup> |
| PID $\rightarrow$ BIU  | 0.119             | 1.218 | 0.088              | 1.354        | 0.176    | H9         | Not supported <sup>b)</sup> |

a) Level of significance of 1%

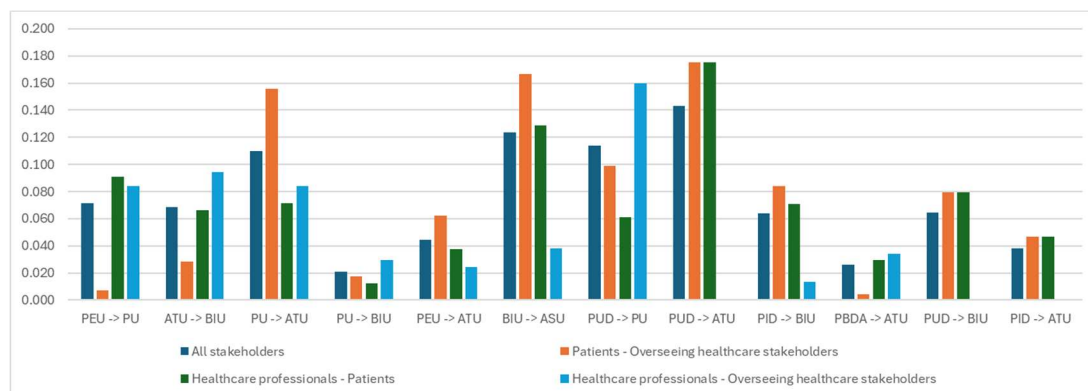
b) Level of significance of 5%

The overseeing healthcare stakeholders' reflective model was also tested to verify the significance of the constructs' interconnections. Following Table 34, p-values demonstrated that from the nine hypotheses defined in Table 9, seven obtained a p-value inferior to 0.01, making them meaningful at a 1% significance level. Of these seven hypotheses, six were related to the technology acceptance model and one was related to the perceived utility of healthcare data influence on the TAM's perceived usefulness of electronic systems to access healthcare data. The importance of healthcare data and the perceived barriers to healthcare data access did not statistically influence the technology acceptance model.

#### 4.6.4. Healthcare stakeholders comparative analysis

With the healthcare stakeholders' PLS-SEM assessments completed, a comparative analysis was performed using the PLS-SEM pathway coefficient-related data from three groups of stakeholders (healthcare professionals, patients and overseeing healthcare stakeholders). According to Figure 23, the stakeholders presented mixed behaviors when engaging with IT to access healthcare data. For example, the lowest standard deviation values were registered on PU -> BIU (0.021) and PBDA -> ATU (0.026) when comparing all stakeholders. PUD -> ATU (0.143) and BIU -> ASU (0.123) were the highest values achieved by all stakeholders. Major differences were observed in PUD -> ATU, BIU -> ASU, and PU -> ATU when comparing patients with overseeing healthcare stakeholders. Healthcare professionals and patients diverged more in PUD -> ATU and BIU -> ASU while PUD -> PU achieved the highest level of disagreement between healthcare professionals and overseeing healthcare stakeholders. It is important to note that PID -> ATU, PUD -> BI, and PUD -> ATU connections were absent in healthcare professionals and overseeing healthcare stakeholders (the value of their path coefficients was classified as 0.000), meaning that the standard deviation between these two stakeholders was 0.

Figure 23. Comparison of standard deviation values in path coefficients of healthcare stakeholders' constructs relationships



As previously noted, pathways from the different stakeholders have different behaviors regarding their coefficient values. For example, patients' and overseeing healthcare stakeholders' PEU -> PU achieved the highest path coefficient (0.616 and 0.606,

respectively), but healthcare professionals only reached 0.487. Another example is the position of the pathway within the type of healthcare stakeholders. PU -> BIU achieved the third higher path coefficient among patients, while among overseeing healthcare stakeholders and healthcare professionals it was positioned on fifth and sixth, respectively. Considering such differences, two types of rankings related to path coefficient values were established: (1) stakeholders' internal ranking and (2) healthcare system ranking (see Table 35). For example, PEU -> PU is ranked 1<sup>st</sup> in each type of stakeholder. However, in the healthcare system ranking, the PEU -> PU ranking's position varies from 1<sup>st</sup> to 6<sup>th</sup>. Another example, PU -> ATU is between 3<sup>rd</sup> and 4<sup>th</sup> in the stakeholder ranking but fluctuates from 4<sup>th</sup> to 17<sup>th</sup> in the healthcare system ranking. Overseeing healthcare stakeholders (60%) and patients (40%) are the only stakeholders in the top 5 of the healthcare system ranking. In the last 5 positions of the same ranking, all stakeholders are represented (40% patients; 40% healthcare professionals; and 20% overseeing healthcare stakeholders). These ranking perspectives showed that stakeholder-dependent behaviors have different levels of contribution when considering the overall landscape of electronic systems to access healthcare data within a healthcare system.

Table 35. Ranking of the influence of constructs within electronic systems to access healthcare data

| Stakeholders                       | Model pathways | Stakeholder ranking <sup>a)</sup> | Healthcare system ranking <sup>b)</sup> |
|------------------------------------|----------------|-----------------------------------|-----------------------------------------|
| Patients                           | PEU -> PU      | 1                                 | 1                                       |
| Overseeing healthcare stakeholders | PEU -> PU      | 1                                 | 2                                       |
| Overseeing healthcare stakeholders | ATU -> BIU     | 2                                 | 3                                       |
| Overseeing healthcare stakeholders | PU -> ATU      | 3                                 | 4                                       |
| Patients                           | ATU -> BIU     | 2                                 | 5                                       |
| Healthcare professional            | PEU -> PU      | 1                                 | 6                                       |
| Healthcare professional            | ATU -> BIU     | 2                                 | 7                                       |
| Overseeing healthcare stakeholders | BIU -> ASU     | 4                                 | 8                                       |
| Healthcare professional            | PU -> ATU      | 3                                 | 9                                       |
| Overseeing healthcare stakeholders | PU -> BIU      | 5                                 | 10                                      |
| Overseeing healthcare stakeholders | PEU -> ATU     | 6                                 | 11                                      |
| Patients                           | PU -> BIU      | 3                                 | 12                                      |
| Healthcare professional            | BIU -> ASU     | 4                                 | 13                                      |
| Overseeing healthcare stakeholders | PUD -> PU      | 7                                 | 14                                      |
| Healthcare professional            | PEU -> ATU     | 5                                 | 15                                      |
| Healthcare professional            | PU -> BIU      | 6                                 | 16                                      |

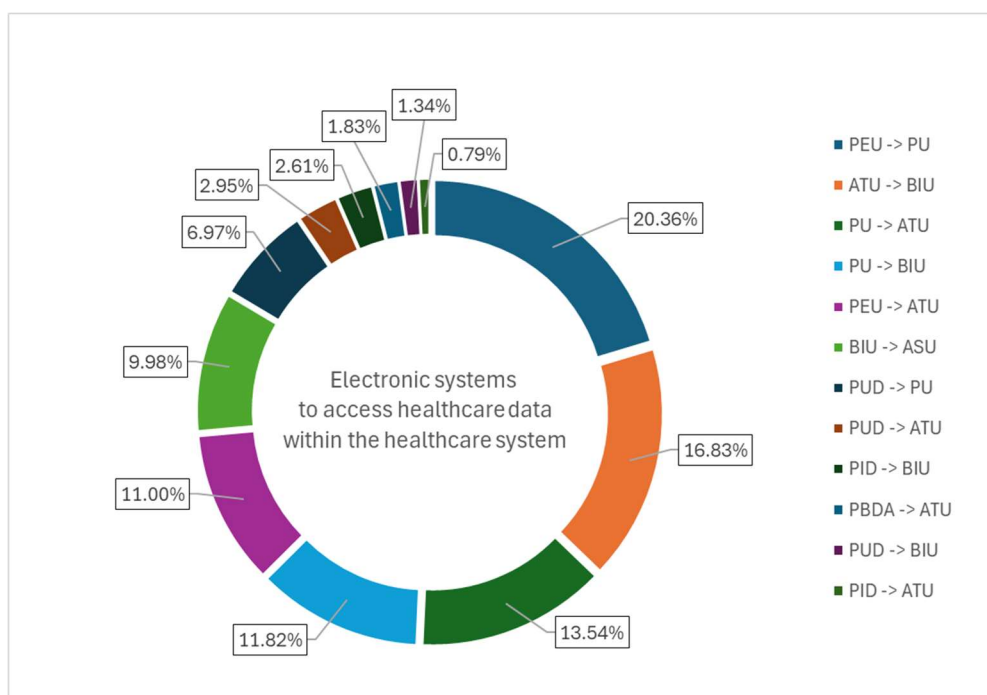
| Stakeholders                       | Model pathways | Stakeholder ranking <sup>a)</sup> | Healthcare system ranking <sup>b)</sup> |
|------------------------------------|----------------|-----------------------------------|-----------------------------------------|
| Patients                           | PU -> ATU      | 4                                 | 17                                      |
| Patients                           | PEU -> ATU     | 5                                 | 18                                      |
| Patients                           | PUD -> ATU     | 6                                 | 19                                      |
| Patients                           | PUD -> PU      | 7                                 | 20                                      |
| Patients                           | BIU -> ASU     | 8                                 | 21                                      |
| Overseeing healthcare stakeholders | PID -> BIU     | 8                                 | 22                                      |
| Patients                           | PUD -> BIU     | 9                                 | 23                                      |
| Healthcare professional            | PID -> BIU     | 7                                 | 24                                      |
| Healthcare professional            | PUD -> PU      | 8                                 | 25                                      |
| Overseeing healthcare stakeholders | PBDA -> ATU    | 9                                 | 26                                      |
| Patients                           | PID -> ATU     | 10                                | 27                                      |
| Patients                           | PBDA -> ATU    | 11                                | 28                                      |
| Healthcare professional            | PBDA -> ATU    | 9                                 | 29                                      |

a) Results from the path coefficient divided by the sum of all the path coefficients of each stakeholder

b) Results from the path coefficient divided by the sum of all the path coefficients of all stakeholders

The placement of each stakeholder's contribution allowed the understanding, at an individual-level analysis, of the drivers affecting IT systems to access healthcare data. An integrated pathways analysis can also be useful in characterizing the motivation behind the healthcare IT landscape within healthcare systems.

Figure 24. Overall relevance of constructs' relationships in the establishment of electronic systems to access healthcare data within the Azorean healthcare system



According to Figure 24, the Azores archipelago IT healthcare landscape is largely (20.36%) influenced by the impact of the perceived ease of use on the perceived usefulness of IT systems. The second most important driver is related to the positiveness provided by the system which can impact stakeholder's intentions toward using such platforms. The influence of the new constructs on the stakeholders' attitudes and behaviors is somewhat residual. Interestingly, the influence of the perceived utility of healthcare data on the perceived usefulness is only responsible for 6.97% of the definition of the acceptance of electronic systems to access healthcare data.

## CHAPTER V – DISCUSSION

Healthcare stakeholders from the Azores archipelago demonstrated mixed opinions regarding electronic systems to access healthcare data. The actual use of the system is one of the examples. Healthcare professionals use more IT systems than patients and overseeing healthcare stakeholders. As this fact may be expected for overseeing healthcare stakeholders, there is a marked lack of engagement towards these technologies among patients. Learning capabilities and comprehension of the use of systems may be linked to health literacy issues of the Azorean population and inadequate technologies to access healthcare data. Moreover, the perceived usefulness of policymakers about IT systems to access healthcare data reached the lowest average score among the analyzed healthcare stakeholders. This may suggest that, in a rigid and centralized healthcare system such as the Azores, top decision-making processes about the choice of an IT healthcare system may be attributed to other factors than its utility for end-users. In general, healthcare stakeholders demonstrated a general awareness of the existence of barriers, with heterogeneity of electronic health records, lack of technical interoperability, and lack of adequate infrastructure having different points of view between certain types of stakeholders. The utility and importance of data demonstrated that healthcare stakeholders are less fond of data about financial and temporal resources than accessibility and clinical and treatment data. As expected, overseeing healthcare stakeholders were slightly more interested (non-significant) in administrative information (e.g. costs and time) than patients and healthcare professionals. Stakeholders also viewed the utility of data for their daily activities as less relevant than the importance of data for the healthcare system's quality. Differences in the importance and utility of data were due to different opinions of patients and healthcare professionals. The ease of use of systems, their perceived usefulness, and stakeholders' attitudes are key concepts in adopting electronic systems to access healthcare data by Azorean healthcare stakeholders. Perceived data utility also has some degree of influence, which indicates that fostering data personalization can bring added value to healthcare IT systems, as it promotes all healthcare stakeholders perceived system utility while enhances also patients' attitudes and behaviors towards healthcare technology adoption. However, as previously demonstrated, the influence of each construct can be stakeholder-dependent, indicating

that multiple optimization strategies for each type of healthcare stakeholder may be required.

The use by the different Azorean healthcare professionals of electronic systems to access data can vary. In general, healthcare professionals perceived the system as being positive and useful. However, their opinion was less favorable regarding its ease of use. Also, their thoughts about the system's ease of use, the attitudes experienced when using it and its effective use were not homogeneous. For example, pharmacists have utilized less the system to access healthcare data than physicians, nurses, and senior diagnostic and therapeutic technicians. Physicians viewed the system as more difficult to use than pharmacists and senior diagnostic and therapeutic technicians. Two barriers were perceived as having a higher impact on the use of the system, namely the lack of adequate infrastructure and technical interoperability. However, this opinion was not homogeneous as senior health technicians disagreed with physicians and nurses. As for the perceptions of the importance of data to the healthcare system and its perceived usefulness to their job performance, it seems utility was a stronger motivator than the importance of data. This may reflect that healthcare professionals are more focused on their individual performance rather than global healthcare performance. These two dimensions only shared four types of data: (1) patients' general information; (2) diagnostic and evaluation of patients' health; (3) prevention and promotion of patients' health and (4) patients' treatments. However, utility and importance constructs did not share data about, demography, identification, and death. Also, different opinions emerged from distinct professionals. For example, phycologists viewed antimicrobial resistance data importance and utility more negatively than nurses. Senior diagnostic and therapeutic technicians additionally diverged from nurses and pharmacists with phycologists in data importance. Azorean healthcare professionals also showed that the different technology acceptance model's constructs have a significant cascade effect on the degree of use of the electronic system to access health data. Moreover, having a user-friendly system seems to be one of the greatest contributors to achieving a higher sense of the utility of their IT system.

The survey of patients from the Azores archipelago provided different and useful insights about the current environment surrounding electronic systems to access healthcare data. Age group differences analysis provided by the one-way ANOVA tool showed that this demographic characteristic did not statistically influence the perceptions

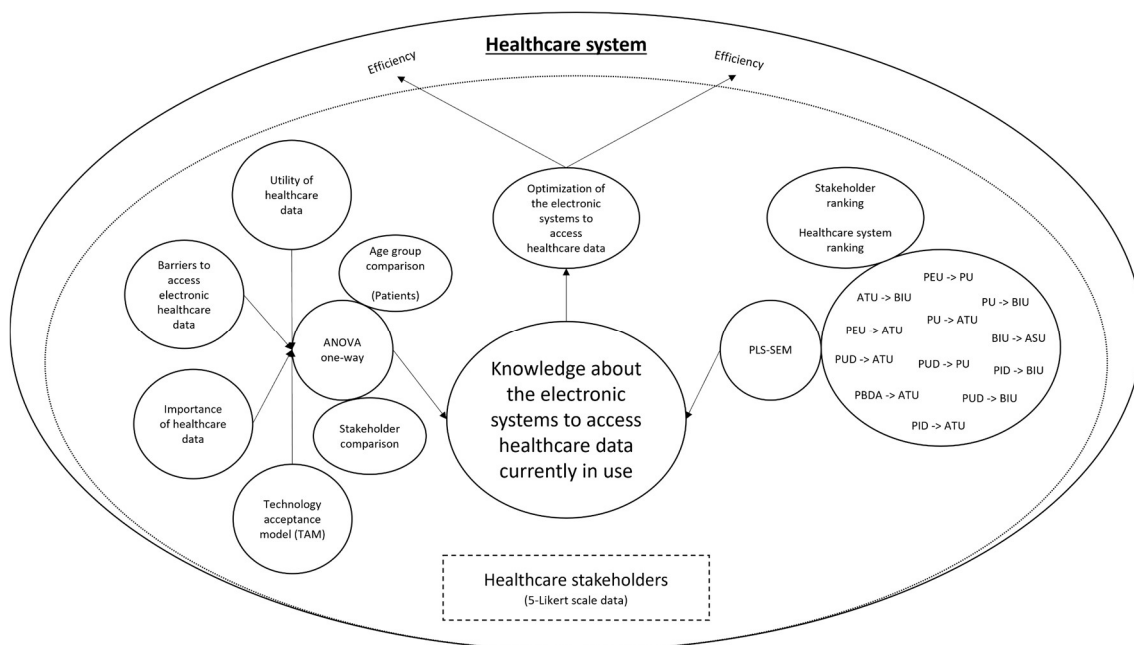
about the different layers of analyzed data (perceived importance was the only construct that obtained a higher level of statistically significant results), contradicting that the idea that technology is affected by age. Patients demonstrated mixed feelings about the perceived utility and ease of use (high standard deviation values) as they perceived the system as slightly more useful than easy to use. They also appear more willing to continue to use their system to access their healthcare data. Patients' attitudes towards using these IT systems registered the highest level of positivity among the technology acceptance model's constructs. This may indicate that patients desire an electronic tool that effectively allows them to manage their health status. However, the usage level by patients of such platforms is residual. One way to promote the increase of the use of IT systems to access healthcare data is by increasing the utility of healthcare data available, which will statistically influence the perceived utility of IT systems and patients' behavior and attitudes. Optimizing the ease of use of electronic systems can also promote their utility and consequently increase the usage frequency of such systems by patients. The existence of barriers and the importance of healthcare data did not produce significant evidence to demonstrate that they influence Azorean patients' views about IT systems to access healthcare data.

### **5.1. Theoretical implications**

The current study provides useful theoretical contributions. The study validated several key relationships proposed by the TAM, while also uncovering new insights through its extended constructs. H1 and H2, which posit that PEU significantly influences both PU and ATU, were supported across stakeholder groups, reaffirming TAM's core proposition. These results suggest that system design remains a foundational driver of technology acceptance among healthcare users, especially professionals and patients. H3 and H4, examining the influence of PU on ATU and BIU, were also validated. This reinforces prior findings that stakeholders are more inclined to adopt technologies they perceive as functionally beneficial (Holden & Karsh, 2010). H5 and H6, which connect attitude and intention with actual system use, were strongly supported among professionals and patients, though somewhat weaker among overseeing healthcare stakeholders. This variation may indicate that administrators, managers, and policymakers do not engage directly with the system, and their use may be driven more

by structural obligations than intention. However, H7 (PBDA → ATU), which hypothesized that perceived barriers to data access influence attitude toward use, was not supported by any stakeholder group. This unexpected result contradicts much of the literature on digital adoption resistance (Genevieve et al., 2019; Palacholla et al., 2019) and suggests that stakeholders may have adapted to infrastructural or systemic limitations, or they may not yet fully recognize these as impediments due to limited engagement. Similarly, H9 (PID → BIU) and H12 (PUD → PU) yielded weak or non-significant results in some models.

Figure 25. Theoretical framework to achieve optimization of electronic systems to access healthcare through healthcare stakeholders' perspectives.



These findings suggest a possible disconnect between the perceived strategic importance or utility of data and stakeholders' behavioral responses. For instance, while users may acknowledge that data is important, this may not directly motivate system adoption without a more immediate, task-related benefit. These results highlight limitations in the classical TAM framework when applied in complex, multi-stakeholder environments such as healthcare. They underscore the need to incorporate contextual and user-specific variables, particularly for non-clinical or governance-level users.

The integrated analysis of different types of healthcare stakeholders allows the analysis of the overall status of the use of healthcare data in a healthcare system (see Figure 25). The two dimensions of analysis provided by the one-way ANOVA and the PLS-SEM reflective model allowed the assessment of diversions between healthcare stakeholders and the constructs' relationships within stakeholders and healthcare systems. One-way ANOVA analysis verified differences between all five types of stakeholders (including intra-stakeholder categories). A segregated analysis of PLS-SEM of healthcare professionals, patients, and overseeing healthcare stakeholders (administrators, managers, and policymakers) allowed the verification of the differences between these three larger groups of stakeholders (including the establishment of rankings). The three newly validated constructs (PID, PUD, and PBDA) can also be added to TAM. The different perspectives of these stakeholders can provide insights into the landscape surrounding electronic systems to access healthcare data, leading to their optimization, and bringing efficiency to healthcare systems.

## **5.2. Managerial implications**

Healthcare decision-makers can benefit from using the theoretical approach in this study to analyze their healthcare systems regarding electronic systems to access healthcare data. The integrated analysis (and intra-stakeholder analysis) of healthcare professionals, patients, administrators, managers, and policymakers can demonstrate the different levels of perceptions among them. These differences could indicate that several possible optimizations and attitude changes can benefit stakeholders and healthcare systems. For example, if healthcare stakeholders are not aligned in their perspectives, this could lead to (1) optimizations within IT solutions available to stakeholders (e.g. turning them into more easy to use solutions to increase perceived system usefulness); (1) replacement of the IT solutions available to stakeholders (e.g. due to poor engagement); (3) training programs (e.g. programs tailored to stakeholders with low engagement) ; (4) changes in the managerial and political perceptions of overseeing healthcare stakeholders; (5) changes in the managerial staff. The perspectives about data importance, barriers to accessing healthcare data, and especially data utility, can also play a crucial role in these changes and optimizations. For example, administrators and policymakers should tailor messaging around data utility rather than abstract system benefits. Policymakers also

should, due to their limitations on perceived utility, incorporate end-users in their decision-making process about the acquisition of IT systems. Healthcare professionals' contributions for robustizing the quality of the entire healthcare system should be reinforced by overseeing healthcare stakeholders. Moreover, and contrasting with reports from literature, age does not seem to influence the reported level of adoption of healthcare systems to access healthcare data by patients. This could reflect the lack of use of such platforms due to poor government communication of the available solutions and their benefits. However, age was somewhat significant regarding the importance and utility of data, meaning that IT designers should prioritize user interfaces adapted to the needs of patients of different ages. Policymakers can address barriers preventing electronic access to healthcare data, which can be stakeholder-specific or systemic. Healthcare professional public associations can also advocate changes in the settings of electronic systems to access healthcare data and develop lobbying activities near managing bodies and policymakers to increase pressure for optimization. This "big picture" analysis is essential for creating a well-accepted electronic system to access healthcare data, which will provide efficiency to healthcare systems.

### **5.3. Limitations and advantages**

The current work has some methodological, contextual and theoretical limitations. Methodological limitations identified include the survey design and construct operationalization. In this way, the multistakeholder approach of the electronic survey may have introduced understanding bias IT systems to access healthcare data were also not exemplified, which could have led to inconsistent interpretations among healthcare stakeholders. Different sample sizes among the five types of healthcare stakeholders could have originated biases in the statistical analysis performed. Regarding contextual limitations, the Azores archipelago is their source. The different landscapes, population types and sizes within this archipelago make it hard to extrapolate findings for each individual reality. As for theoretical constraints, this extended TAM reach is limited to its boundaries, as it does not contain all the features necessary to comprehend all the factors influencing the adoption of healthcare technology (e.g. social and cultural influences). Also, not all new constructs reached a robust level of significance, meaning that their influence within the model was not statistically proven. This happening may be due to

the way the survey questions for the new constructs were formulated, as some were based on empirical knowledge and not on previous validated works.

To the best of our knowledge, this is the first research in which the perspectives of healthcare professionals, patients, administrators, managers, and policymakers are analyzed together about IT systems to access healthcare data, by using the technology acceptance model combined with data utility, data importance, and barriers to data access. Secondly, this research provides a stakeholder ranking and healthcare system ranking that can introduce a new form of evaluation of the adoption of technologies by users. Finally, the condensed constructs' relationships analysis provided their relative contributions to the current use of electronic systems to access healthcare data, allowing the characterization of the healthcare system IT landscape.

#### **5.4. Future directions**

The assessment performed in this study provides some contributions for future research. The innovative survey which reaches five different categories of healthcare stakeholders may be reused to collect stakeholders' perspectives about IT healthcare systems in other geographies (e.g. country and regional level). The survey can also be applied to only one type of stakeholder to gather specific insights and knowledge. However, modifications to it, such as adapting non-TAM questions to the three new constructs, may improve the clarity of the questionnaire. The PID, PUD, and PBDA constructs can also be added to the technology acceptance model and its variants to compare results and verify the consistency of behaviors toward healthcare technologies. Other acceptance technology frameworks such as the diffusion of innovation (DOI) theory and the unified theory of acceptance and use of technology (UTAUT) may also be used further comparisons and adaptations. These new concepts can also be used for the evaluation of different geographical or healthcare system maturity contexts. The stakeholder ranking and the healthcare system ranking, together with the relative weight of constructs' relationships are new tools that can effectively characterize several IT healthcare technologies within stakeholders and healthcare systems, allowing the comparison of results between regions or countries to be performed in future studies.

## CHAPTER VI – CONCLUSION

Azorean healthcare stakeholders do not perceive their acceptance of healthcare IT in an equal manner. Their use and understanding of such electronic platforms to access healthcare data is stakeholder-dependent and can be associated with motivators and barriers that can enhance these type of mix behaviors. The different relationships with technology suggest that Azorean stakeholders have specific needs that if addressed individually can lead to the optimization of the acceptance of IT within the healthcare settings.

This study allowed the analysis of the differences between healthcare stakeholders' opinions about electronic systems to access healthcare data through the technology acceptance model and the influence of data utility, data importance, and barriers to healthcare data access by a PLS-SEM reflective model and a one-way ANOVA analysis. The differences encountered within the one-way ANOVA analyses pointed out that the use of electronic systems to access healthcare data is heterogeneous among healthcare stakeholders. Patients and healthcare professionals are revealed to be between the stakeholders with a higher number of significant differences in their perspectives. Healthcare professionals possess common opinions between them but also diverging ones, all depending on the type of professional. The age of patients did not influence greatly the opinion of this type of stakeholder, as opposed to findings in literature. The comparative analysis between patients, healthcare professionals, and overseeing healthcare stakeholders (administrators, managers, and policymakers) through path coefficients of the different constructs' relationships made possible the characterization of the different healthcare stakeholders and the definition of the environment associated with the healthcare system. Constructs such as the Perceived Ease of Use, Perceived Usefulness, and Attitudes Towards Using can strongly influence the stakeholders' adoption of electronic systems to access healthcare data within the Azores archipelago. The Perceived Usefulness of Healthcare Data construct is the only one of the new constructs with some degree of influence in the acceptance of such platforms. However, the integration of such new concepts (PID, PUD, and PBDA) in models such as the TAM can demonstrate their impact on the stakeholders' behaviors for adopting technology (which can lead to surgical or bulk optimizations), by leading to a better understanding

of the existence and influence of specific barriers to the access of healthcare data that could be tackled by stakeholders and to the comprehension of the importance of specific data to the overall healthcare system quality and their utility for healthcare stakeholders' personal and professional purposes. Through these new types of tools (rankings and relative comparisons), evaluating different healthcare environments surrounding healthcare IT solutions can lead to specific optimizations and benchmark comparisons which can enhance the adoption of technologies in healthcare. Some benchmark comparisons and study replications may use other theories about the acceptance of technology, such as extended and modified TAMs, the diffusion of innovation (DOI) theory and the unified theory of acceptance and use of technology (UTAUT). Other geographical contexts, namely island regions and population typologies, are also suitable for extending this study. New stakeholder types, such as healthcare IT vendors, patient advocates, regulators and private healthcare payers, can also be added to cover entire healthcare systems.

We now live in a digital era where more and more digital processes are being created continuously to improve healthcare. Only with great knowledge, great improvements can be obtained. In this way, this work tries to make a small contribution to the buildup of such great knowledge and, with it, strengthen healthcare systems wherever they may be.

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## ANNEXES

## Annex I – Reproduction of the original online survey (in Portuguese)

### Inquérito sobre dados em saúde destinado a residentes nos Açores

#### Secção 1 – Consentimento informado

Autor: Tiago Filipe Tavares Costa

O atual trabalho de investigação, intitulado “*Healthcare Data Linkage Value Management*”, insere-se num estudo que decorre no âmbito do **Doutoramento em Ciências Económicas e Empresariais da Universidade dos Açores** e tem como principal objetivo compreender e analisar as diferentes perspetivas e motivações dos *stakeholders* da saúde açorianos no que respeita à adoção e uso de sistemas eletrónicos de acesso a dados de saúde. **Pretende-se contribuir para um melhor conhecimento sobre este tema, sendo necessário, para tal, incluir neste estudo a participação de diversos *stakeholders* da área da saúde (administrador(a); decisor(a) político(a); gestor(a); profissional de saúde; utente).** Neste sentido apelamos à sua colaboração que é fundamental para a realização deste trabalho.

Os resultados obtidos serão utilizados apenas para fins académicos, podendo, no mesmo âmbito serem alvo de divulgação (ex.: congressos científicos ou iniciativas de interesse público) e/ou publicação científica (ex.: revistas científicas ou repositórios institucionais). A qualquer altura do preenchimento do questionário pode suspender o seu preenchimento sem que qualquer dado seja registado (ou gravado). Contudo após a submissão do questionário já não é possível retirá-lo do estudo, uma vez que este é anónimo e como tal não permite a identificação das participantes. Se desejar, poderá contactar o autor para se inteirar dos resultados genéricos obtidos neste trabalho. Este estudo não lhe trará nenhuma despesa ou risco. Obrigado pela sua colaboração.

Mais se informa que este trabalho de investigação foi aprovado pela Comissão de Ética da Universidade dos Açores através do Parecer n.º 3/2024 de 16 de janeiro de 2024.

Contato do investigador para dúvidas ou esclarecimentos: [20127074@uac.pt](mailto:20127074@uac.pt)

Ao clicar em “Seguinte” estará a concordar com os termos e condições descritos acima.

#### Secção 2 – Dados gerais dos *stakeholders* (Parte I)

##### Escolha do tipo de *stakeholder*

2.1 – Na qualidade de que tipo de *stakeholder* da área da saúde pretende responder a este questionário? (deverá selecionar aquele que se enquadra melhor na sua relação com a área da saúde).

Administrador(a)

Decisor(a) político(a)

Gestor(a)

Profissional de saúde

Utente

##### Escolha do tipo de profissional de saúde

2.2 – Dado que selecionou “Profissional de saúde”, selecione abaixo qual a profissão que melhor descreve a sua função:

Enfermeiro(a)

Farmacêutico(a)

Médico(a)

|                                                  |
|--------------------------------------------------|
| Nutricionista                                    |
| Psicólogo(a)                                     |
| Técnico(a) superior de saúde                     |
| Técnico(a) superior de diagnóstico e terapêutica |

|                                                                                               |
|-----------------------------------------------------------------------------------------------|
| <b>Tipo de setor em que exerce as suas funções na área da saúde</b>                           |
| 2.3 – Em que tipo de setor exerce as suas funções na área da saúde? (não aplicável a utentes) |
| Setor público                                                                                 |
| Setor privado                                                                                 |
| Setor social                                                                                  |

|                              |
|------------------------------|
| <b>Secção 3 – Modelo TAM</b> |
|------------------------------|

3.1 – Relativamente à sua **perceção de utilidade** dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, selecione o seu respetivo grau de concordância relativamente às afirmações que se apresentam de seguida (caso sejam aplicáveis ao seu tipo de *stakeholder*):

| <i>Perceived Usefulness (PU)</i>                                                                                                                                                                                           | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente | Não Aplicável |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|---------------|
| O sistema eletrónico de acesso a dados de saúde permite-me realizar tarefas mais rapidamente                                                                                                                               |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde permite-me aceder ao estado da minha saúde mais rapidamente (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”) |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde melhorou a qualidade do meu trabalho                                                                                                                                       |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde melhorou a qualidade da minha saúde (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”)                         |                           |                     |          |          |                     |               |

3.1 – Relativamente à sua **perceção de utilidade** dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, selecione o seu respetivo grau de concordância relativamente às afirmações que se apresentam de seguida (caso sejam aplicáveis ao seu tipo de *stakeholder*):

| <b><i>Perceived Usefulness (PU)</i></b>                                                                                                                                                                              | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente | Não Aplicável |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|---------------|
| contrário deverá assinalar “Não Aplicável”)                                                                                                                                                                          |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde facilita a realização do meu trabalho                                                                                                                                |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde facilita o acesso aos meus dados de saúde (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”)             |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde aumentou a minha produtividade                                                                                                                                       |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde aumentou o conhecimento sobre o estado da minha saúde (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”) |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde providencia maior controlo sobre o meu trabalho                                                                                                                      |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde providencia maior controlo sobre o estado da minha saúde (responder apenas se está a responder na                                                                    |                           |                     |          |          |                     |               |

**3.1 – Relativamente à sua perceção de utilidade dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, seleccione o seu respetivo grau de concordância relativamente às afirmações que se apresentam de seguida (caso sejam aplicáveis ao seu tipo de *stakeholder*):**

| <b><i>Perceived Usefulness (PU)</i></b>                                                                                                                                                                          | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente | Não Aplicável |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|---------------|
| qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”)                                                                                                                                            |                           |                     |          |          |                     |               |
| O sistema de eletrónico de acesso a dados de saúde potencia a eficácia no meu trabalho                                                                                                                           |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde potencia a eficácia dos meus tratamentos clínicos (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”) |                           |                     |          |          |                     |               |

**3.2 – Relativamente à sua perceção da facilidade de utilização dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, seleccione o seu respetivo grau de concordância relativamente às afirmações que se apresentam de seguida:**

| <b><i>Perceived Ease of Use (PEU)</i></b>                                                            | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente | Não Aplicável |
|------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|---------------|
| A minha interação com o sistema eletrónico de acesso a dados de saúde tem sido clara e compreensível |                           |                     |          |          |                     |               |
| Em geral, o sistema eletrónico de acesso a dados de saúde tem sido fácil de usar                     |                           |                     |          |          |                     |               |
| A aprendizagem do uso do sistema eletrónico de acesso a dados de saúde foi fácil                     |                           |                     |          |          |                     |               |
| Raramente fico confuso quando uso o sistema eletrónico de acesso a dados de saúde                    |                           |                     |          |          |                     |               |
| Raramente cometo erros quando uso o sistema eletrónico de acesso a dados de saúde                    |                           |                     |          |          |                     |               |
| Raramente fico frustrado quando uso o sistema eletrónico de acesso a dados de saúde                  |                           |                     |          |          |                     |               |

**3.3 – Relativamente à sua intenção de utilização dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, selecione o seu respetivo grau de concordância relativamente às afirmações que se apresentam de seguida (caso sejam aplicáveis ao seu tipo de *stakeholder*):**

| <i>Behavioral Intention to Use (BIU)</i>                                                                                                                                                                                                            | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente | Não Aplicável |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|---------------|
| Tenho intenção de continuar a utilizar o sistema eletrónico de acesso a dados de saúde na realização do meu trabalho                                                                                                                                |                           |                     |          |          |                     |               |
| Tenho intenção de continuar a utilizar o sistema eletrónico de acesso a dados de saúde no acompanhamento do estado da minha saúde (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”)    |                           |                     |          |          |                     |               |
| Tenho intenção de utilizar frequentemente o sistema eletrónico de acesso a dados de saúde na realização do meu trabalho                                                                                                                             |                           |                     |          |          |                     |               |
| Tenho intenção de utilizar frequentemente o sistema eletrónico de acesso a dados de saúde no acompanhamento do estado da minha saúde (responder apenas se está a responder na qualidade de utente. Caso contrário deverá assinalar “Não Aplicável”) |                           |                     |          |          |                     |               |

**3.4 – Relativamente ao tipo de atitude imposta na utilização dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, selecione o seu respetivo grau de concordância relativamente às afirmações que se apresentam de seguida:**

| <i>Attitude Toward Using (ATU)</i>                                                                                             | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente | Não Aplicável |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|---------------|
| Eu penso de forma positiva quando pretendo utilizar o sistema eletrónico de acesso a dados de saúde                            |                           |                     |          |          |                     |               |
| O sistema eletrónico de acesso a dados de saúde é uma ferramenta positiva na gestão de dados de saúde                          |                           |                     |          |          |                     |               |
| O uso do sistema eletrónico de acesso a dados de saúde na gestão de dados de saúde é uma boa ideia                             |                           |                     |          |          |                     |               |
| Vale a pena utilizar o sistema eletrónico de acesso a dados de saúde na gestão de dados de saúde                               |                           |                     |          |          |                     |               |
| Pretendo, no futuro, utilizar de forma regular o sistema eletrónico de acesso a dados de saúde para a gestão de dados em saúde |                           |                     |          |          |                     |               |
| Considero agradável o uso do sistema eletrónico de acesso a dados de saúde na gestão de dados de saúde                         |                           |                     |          |          |                     |               |

3.5 – Relativamente à **frequência atual de utilização** dos sistemas eletrónicos de acesso a dados de saúde em vigor na Região Autónoma dos Açores que utiliza, selecione o seu a nível de frequência de utilização que mais se adequa a si:

| <i>Actual System in Use</i> (ASU)                                                       | Muito frequente | Frequente | Eventualmente | Raramente | Nunca |
|-----------------------------------------------------------------------------------------|-----------------|-----------|---------------|-----------|-------|
| Com que frequência utiliza o sistema eletrónico de acesso a dados de saúde num dia?     |                 |           |               |           |       |
| Com que frequência utiliza o sistema eletrónico de acesso a dados de saúde numa semana? |                 |           |               |           |       |

#### Secção 4 – Identificação de barreiras ao acesso eletrónico a dados de saúde

4 – Relativamente às **barreiras que impedem** o acesso eletrónico a dados de saúde na Região Autónoma dos Açores, selecione o seu respetivo grau de concordância relativamente à existência ou não das barreiras apresentadas de seguida:

| <b>Barreiras</b>                                      | Não concordo nem discordo | Discordo totalmente | Discordo | Concordo | Concordo totalmente |
|-------------------------------------------------------|---------------------------|---------------------|----------|----------|---------------------|
| Heterogeneidade dos registos de saúde eletrónicos     |                           |                     |          |          |                     |
| Riscos associados à garantia de privacidade dos dados |                           |                     |          |          |                     |
| Restrições legais                                     |                           |                     |          |          |                     |
| Falta de infraestruturas adequadas                    |                           |                     |          |          |                     |
| Riscos associados à cibersegurança                    |                           |                     |          |          |                     |
| Falta de interoperabilidade técnica                   |                           |                     |          |          |                     |
| Qualidade e confiabilidade dos dados                  |                           |                     |          |          |                     |
| Falta de conhecimento dos stakeholders                |                           |                     |          |          |                     |
| Falta de interesse dos stakeholders                   |                           |                     |          |          |                     |

#### Secção 5 – Utilidade de acesso a dados de saúde específicos

Considera os dados úteis para atingir os seus objetivos pessoais e/ou profissionais?

5.1 – Relativamente aos **dados associados à informação geral dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| <b>Dados associados à informação geral dos utentes</b> | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|--------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Alergias e intolerâncias                               |           |            |                    |      |            |
| Demografia                                             |           |            |                    |      |            |
| Gravidez                                               |           |            |                    |      |            |

5.1 – Relativamente aos **dados associados à informação geral dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| <b>Dados associados à informação geral dos utentes</b> | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|--------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Hábitos                                                |           |            |                    |      |            |
| História clínica e familiar                            |           |            |                    |      |            |
| Identificação                                          |           |            |                    |      |            |
| Óbito                                                  |           |            |                    |      |            |
| Patologias                                             |           |            |                    |      |            |

5.2 – Relativamente aos **dados associados à avaliação e diagnóstico da saúde dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| <b>Dados associados à avaliação e diagnóstico da saúde dos utentes</b> | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|------------------------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Avaliação antropométrica                                               |           |            |                    |      |            |
| Exames laboratoriais                                                   |           |            |                    |      |            |
| Exames imagiológicos                                                   |           |            |                    |      |            |
| Testes rápidos                                                         |           |            |                    |      |            |
| Exames físicos                                                         |           |            |                    |      |            |
| Electrocardiograma                                                     |           |            |                    |      |            |
| Parâmetros vitais                                                      |           |            |                    |      |            |

5.3 – Relativamente aos **dados associados à prevenção e promoção da saúde dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| <b>Dados associados à prevenção e promoção da saúde dos utentes</b> | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|---------------------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Vacinação e imunização                                              |           |            |                    |      |            |
| Rastreios                                                           |           |            |                    |      |            |
| Alimentação                                                         |           |            |                    |      |            |
| Atividade física                                                    |           |            |                    |      |            |
| Resistência aos antimicrobianos                                     |           |            |                    |      |            |
| Tabagismo                                                           |           |            |                    |      |            |
| Epidemiologia                                                       |           |            |                    |      |            |

5.4 – Relativamente aos **dados associados aos tratamentos efetuados aos utentes**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| Dados associados aos tratamentos efetuados aos utentes | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|--------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Medicamentos                                           |           |            |                    |      |            |
| Produtos farmacêuticos                                 |           |            |                    |      |            |
| Material clínico                                       |           |            |                    |      |            |
| Material laboratorial                                  |           |            |                    |      |            |
| Interações medicamentosas                              |           |            |                    |      |            |
| Posologia                                              |           |            |                    |      |            |
| Informação técnica de tecnologias de saúde             |           |            |                    |      |            |

5.5 – Relativamente aos **dados associados ao acesso dos utentes aos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| Dados associados ao acesso dos utentes aos cuidados de saúde | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|--------------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Acesso às urgências                                          |           |            |                    |      |            |
| Acesso a consultas                                           |           |            |                    |      |            |
| Acesso a tratamentos                                         |           |            |                    |      |            |
| Acesso a cirurgias                                           |           |            |                    |      |            |

5.6 – Relativamente aos **dados associados aos recursos financeiros despendidos nos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| Dados associados aos recursos financeiros despendidos nos cuidados de saúde | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|-----------------------------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Custo com meios complementares de diagnóstico e terapêutica                 |           |            |                    |      |            |
| Custo com medicamentos                                                      |           |            |                    |      |            |
| Custo com produtos farmacêuticos                                            |           |            |                    |      |            |
| Custo com material clínico                                                  |           |            |                    |      |            |
| Custo com material laboratorial                                             |           |            |                    |      |            |
| Custo com recursos humanos                                                  |           |            |                    |      |            |

5.7 – Relativamente aos **dados associados aos recursos temporais despendidos nos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de utilidade:

| <b>Dados associados aos recursos temporais despendidos nos cuidados de saúde</b> | Nada útil | Pouco útil | Razoavelmente útil | Útil | Muito útil |
|----------------------------------------------------------------------------------|-----------|------------|--------------------|------|------------|
| Tempo médio de consulta                                                          |           |            |                    |      |            |
| Tempo médio de tratamento                                                        |           |            |                    |      |            |
| Tempo médio de espera                                                            |           |            |                    |      |            |
| Tempo médio de gestão e administração                                            |           |            |                    |      |            |

### Secção 6 – Importância de acesso a dados de saúde específicos

Considera os dados importantes para o aumento da qualidade da prestação de cuidados de saúde?

6.1 – Relativamente aos **dados associados à informação geral dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados à informação geral dos utentes</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|--------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Alergias e intolerâncias                               |                 |                  |                          |            |                  |
| Demografia                                             |                 |                  |                          |            |                  |
| Gravidez                                               |                 |                  |                          |            |                  |
| Hábitos                                                |                 |                  |                          |            |                  |
| História clínica e familiar                            |                 |                  |                          |            |                  |
| Identificação                                          |                 |                  |                          |            |                  |
| Óbito                                                  |                 |                  |                          |            |                  |
| Patologias                                             |                 |                  |                          |            |                  |

6.2 – Relativamente aos **dados associados à avaliação e diagnóstico da saúde dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados à avaliação e diagnóstico da saúde dos utentes</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|------------------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Avaliação antropométrica                                               |                 |                  |                          |            |                  |
| Exames laboratoriais                                                   |                 |                  |                          |            |                  |
| Exames imagiológicos                                                   |                 |                  |                          |            |                  |
| Testes rápidos                                                         |                 |                  |                          |            |                  |
| Exames físicos                                                         |                 |                  |                          |            |                  |

6.2 – Relativamente aos **dados associados à avaliação e diagnóstico da saúde dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados à avaliação e diagnóstico da saúde dos utentes</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|------------------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Eletrocardiograma                                                      |                 |                  |                          |            |                  |
| Parâmetros vitais                                                      |                 |                  |                          |            |                  |

6.3 – Relativamente aos **dados associados à prevenção e promoção da saúde dos utentes**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados à prevenção e promoção da saúde dos utentes</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|---------------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Vacinação e imunização                                              |                 |                  |                          |            |                  |
| Rastreios                                                           |                 |                  |                          |            |                  |
| Alimentação                                                         |                 |                  |                          |            |                  |
| Atividade física                                                    |                 |                  |                          |            |                  |
| Resistência aos antimicrobianos                                     |                 |                  |                          |            |                  |
| Tabagismo                                                           |                 |                  |                          |            |                  |
| Epidemiologia                                                       |                 |                  |                          |            |                  |

6.4 – Relativamente aos **dados associados aos tratamentos efetuados aos utentes**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados aos tratamentos efetuados aos utentes</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|---------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Medicamentos                                                  |                 |                  |                          |            |                  |
| Produtos farmacêuticos                                        |                 |                  |                          |            |                  |
| Material clínico                                              |                 |                  |                          |            |                  |
| Material laboratorial                                         |                 |                  |                          |            |                  |
| Interações medicamentosas                                     |                 |                  |                          |            |                  |
| Posologia                                                     |                 |                  |                          |            |                  |
| Informação técnica de tecnologias de saúde                    |                 |                  |                          |            |                  |

6.5 – Relativamente aos **dados associados ao acesso dos utentes aos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados ao acesso dos utentes aos cuidados de saúde</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|---------------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Acesso às urgências                                                 |                 |                  |                          |            |                  |

6.5 – Relativamente aos **dados associados ao acesso dos utentes aos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados ao acesso dos utentes aos cuidados de saúde</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|---------------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Acesso a consultas                                                  |                 |                  |                          |            |                  |
| Acesso a tratamentos                                                |                 |                  |                          |            |                  |
| Acesso a cirurgias                                                  |                 |                  |                          |            |                  |

6.6 – Relativamente aos **dados associados aos recursos financeiros despendidos nos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados aos recursos financeiros despendidos nos cuidados de saúde</b> | Nada importante | Pouco importante | Razoavelmente importante | Importante | Muito importante |
|------------------------------------------------------------------------------------|-----------------|------------------|--------------------------|------------|------------------|
| Custo com meios complementares de diagnóstico e terapêutica                        |                 |                  |                          |            |                  |
| Custo com medicamentos                                                             |                 |                  |                          |            |                  |
| Custo com produtos farmacêuticos                                                   |                 |                  |                          |            |                  |
| Custo com material clínico                                                         |                 |                  |                          |            |                  |
| Custo com material laboratorial                                                    |                 |                  |                          |            |                  |
| Custo com recursos humanos                                                         |                 |                  |                          |            |                  |

6.7 – Relativamente aos **dados associados aos recursos temporais despendidos nos cuidados de saúde**, classifique o acesso aos mesmos quanto ao seu grau de importância:

| <b>Dados associados aos recursos temporais despendidos nos cuidados de saúde</b> | Muito importante | Importante | Razoavelmente importante | Pouco importante | Nada importante |
|----------------------------------------------------------------------------------|------------------|------------|--------------------------|------------------|-----------------|
| Tempo médio de consulta                                                          |                  |            |                          |                  |                 |
| Tempo médio de tratamento                                                        |                  |            |                          |                  |                 |
| Tempo médio de espera                                                            |                  |            |                          |                  |                 |
| Tempo médio de gestão e administração                                            |                  |            |                          |                  |                 |

## Secção 7 – Dados gerais dos *stakeholders* (Parte II)

7.1 – Em qual dos seguintes **concelhos dos Açores** reside?

|                   |
|-------------------|
| Angra do Heroísmo |
| Calheta           |
| Corvo             |
| Horta             |
| Lagoa             |
| Lajes Das Flores  |
| Lajes Do Pico     |

7.1 – Em qual dos seguintes **concelhos dos Açores** reside?

Madalena

Nordeste

Ponta Delgada

Povoação

Praia Da Vitória

Ribeira Grande

Santa Cruz Da Graciosa

Santa Cruz Das Flores

São Roque Do Pico

Velas

Vila Do Porto

Vila Franca Do Campo

7.2 – Em qual das faixas etárias seguintes se enquadra?

Até 18 anos

19 a 24 anos

25 a 34 anos

35 a 44 anos

45 a 54 anos

55 a 64 anos

65 ou mais

7.3 – Qual é o seu género?

Masculino

Feminino

Outro

Prefiro não responder

## Annex II – Translated reproduction of the online survey (in English)

### Questionnaire about healthcare data meant for the residents in the Azores

#### Section 1 – Informed consent

Author: Tiago Filipe Tavares Costa

The current research work, entitled “**Healthcare Data Linkage Value Management**”, is part of a study that takes place within the scope of the **Doctorate in Economic and Business Sciences at the University of the Azores** and has as its main objective to understand and analyse the different perspectives and motivations of Azorean healthcare stakeholders with regard to the adoption and use of electronic systems for accessing healthcare data. **The aim is to contribute to a better understanding of this topic, and to this end, it is necessary to include in this study the participation of various stakeholders of the healthcare sector (administrator; policymaker; manager; healthcare professional; patient).** In this sense, we appeal for your collaboration, which is essential for the completion of this work.

The results obtained will be used only for academic purposes and may, within the same scope, be subject to dissemination (e.g.: scientific conferences or initiatives of public interest) and/or scientific publication (e.g.: scientific journals or institutional repositories). At any time while filling out the questionnaire, you can stop filling it out without any data being recorded (or saved). However, after submitting the questionnaire, it is no longer possible to remove it from the study, as it is anonymous and therefore does not allow the identification of participants. If you wish, you can contact the author to learn about the general results obtained in this work. This study will not involve any expense or risk for you. Thank you for your cooperation.

This research project was also approved by the Ethics Committee of the University of the Azores through deliberation n. ° 3/2024 of January 16, 2024.

Contact of the researcher for questions or clarifications: [20127074@uac.pt](mailto:20127074@uac.pt)

By clicking “Next” you will be agreeing to the terms and conditions described above.

#### Section 2 – Stakeholders general information (Part I)

##### Selection of stakeholder category

2.1 – In what type of healthcare stakeholders do you pretend to fill out this questionnaire? (you must select the one that is more adequate according to your relationship with the healthcare sector)

Administrator

Policymaker

Manager

Healthcare professional

Patient

##### Selection of healthcare professional category

2.2 – If you selected “Healthcare Professional”, please select below which profession is more related to your job functions:

Nurse

Pharmacist

Physician

| Selection of healthcare professional category                                                                                |
|------------------------------------------------------------------------------------------------------------------------------|
| 2.2 – If you selected “Healthcare Professional”, please select below which profession is more related to your job functions: |
| Nutritionist                                                                                                                 |
| Psychologist                                                                                                                 |
| Senior health technician                                                                                                     |
| Senior diagnostic and therapeutic technician                                                                                 |

| Type of sector where you perform your healthcare-related job                                   |
|------------------------------------------------------------------------------------------------|
| 2.3 – In which type of healthcare sector do you perform your healthcare job-related functions? |
| Public sector                                                                                  |
| Private sector                                                                                 |
| Social sector                                                                                  |

| Section 3 – TAM model |
|-----------------------|
|-----------------------|

| 3.1 – Regarding your <b>perception of the utility</b> of electronic systems in use in the Autonomous Region of the Azores to access <b>healthcare data</b> , please select your <b>agreement degree</b> with the following sentences (in case they apply to your type of stakeholder): |                           |                  |          |       |               |                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|----------|-------|---------------|----------------|
| Perceived Usefulness (PU)                                                                                                                                                                                                                                                              | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree | Non applicable |
| The electronic system to access healthcare data enables me to accomplish tasks more quickly                                                                                                                                                                                            |                           |                  |          |       |               |                |
| The electronic system to access healthcare data enables me to access my healthcare status more quickly (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”)                                                                                  |                           |                  |          |       |               |                |
| The electronic system to access healthcare data has improved my quality of work                                                                                                                                                                                                        |                           |                  |          |       |               |                |
| The electronic system to access healthcare data has improved the quality of my health (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”)                                                                                                   |                           |                  |          |       |               |                |
| The electronic system to access healthcare data makes it easier to do my job                                                                                                                                                                                                           |                           |                  |          |       |               |                |

3.1 – Regarding your **perception of the utility** of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your **agreement degree** with the following sentences (in case they apply to your type of stakeholder):

| Perceived Usefulness (PU)                                                                                                                                                                             | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree | Non applicable |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|----------|-------|---------------|----------------|
| The electronic system to access healthcare data makes it easier to access my healthcare data (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”)           |                           |                  |          |       |               |                |
| The electronic system to access healthcare data has improved my productivity                                                                                                                          |                           |                  |          |       |               |                |
| The electronic system to access healthcare data increased my knowledge about my health status (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”)          |                           |                  |          |       |               |                |
| The electronic system to access healthcare data gives me greater control over my job                                                                                                                  |                           |                  |          |       |               |                |
| The electronic system to access healthcare data gives me greater control over my health status (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”)         |                           |                  |          |       |               |                |
| The electronic system to access healthcare data enhances my effectiveness on the job                                                                                                                  |                           |                  |          |       |               |                |
| The electronic system to access healthcare data enhances the effectiveness of my healthcare treatments (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”) |                           |                  |          |       |               |                |

3.2 – Regarding your **perception of the ease of use** of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your agreement degree with the following sentences:

| Perceived Ease of Use (PEU)                                                                           | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree | Non applicable |
|-------------------------------------------------------------------------------------------------------|---------------------------|------------------|----------|-------|---------------|----------------|
| My interaction with the electronic system to access healthcare data has been clear and understandable |                           |                  |          |       |               |                |
| Overall, the electronic system to access healthcare data is easy to use                               |                           |                  |          |       |               |                |
| Learning to operate with the electronic system to access healthcare data was easy for me              |                           |                  |          |       |               |                |
| I rarely become confused when I use the electronic system to access healthcare data                   |                           |                  |          |       |               |                |
| I rarely make errors when using the electronic system to access healthcare data                       |                           |                  |          |       |               |                |
| I am rarely frustrated when using the electronic system to access healthcare data                     |                           |                  |          |       |               |                |

3.3 – Regarding your **intention to use** electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your agreement degree with the following sentences (in case they apply to your type of stakeholder):

| Behavioral Intention to Use (BIU)                                                                                                                                                                       | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree | Non applicable |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|----------|-------|---------------|----------------|
| I intend to continue using the electronic system to access healthcare data to perform my job                                                                                                            |                           |                  |          |       |               |                |
| I intend to continue using the electronic system to access healthcare data to follow up my health status (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”) |                           |                  |          |       |               |                |
| I intend to frequently use the electronic system to access healthcare data to perform my job                                                                                                            |                           |                  |          |       |               |                |
| I intend to frequently use the electronic system to access healthcare data to follow up my health status (respond only if you are responding as a patient. Otherwise, you must select “Non Applicable”) |                           |                  |          |       |               |                |

3.4 – Regarding your **attitude towards the use** of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your agreement degree with the following sentences:

| Attitude Toward Using (ATU)                                                    | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree | Non applicable |
|--------------------------------------------------------------------------------|---------------------------|------------------|----------|-------|---------------|----------------|
| I think positively about using the electronic system to access healthcare data |                           |                  |          |       |               |                |

3.4 – Regarding your **attitude towards the use** of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select your **agreement degree** with the following sentences:

| Attitude Toward Using (ATU)                                                                            | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree | Non applicable |
|--------------------------------------------------------------------------------------------------------|---------------------------|------------------|----------|-------|---------------|----------------|
| The electronic system to access healthcare data is a positive tool for health data management          |                           |                  |          |       |               |                |
| Using the electronic system to access healthcare data is a good idea                                   |                           |                  |          |       |               |                |
| The electronic system to access healthcare data is worth to use for health data management             |                           |                  |          |       |               |                |
| I plan on using the electronic system to access healthcare data on a regular basis in the future       |                           |                  |          |       |               |                |
| Using the electronic system to access healthcare data within the management of health data is pleasant |                           |                  |          |       |               |                |

3.5 – Regarding your **actual frequency of use** of electronic systems in use in the Autonomous Region of the Azores to access healthcare data, please select the **frequency level** of use most adequate for you:

| Actual System in Use (ASU)                                                               | Very frequently | Frequently | Occasionally | Rarely | Never |
|------------------------------------------------------------------------------------------|-----------------|------------|--------------|--------|-------|
| How many times do you use the electronic system to access healthcare data during a day?  |                 |            |              |        |       |
| How many times do you use the electronic system to access healthcare data during a week? |                 |            |              |        |       |

#### Section 4 – Identification of barriers preventing electronic access to health data

4 – Regarding the **barriers preventing electronic access to health data in the Autonomous Region of the Azores**, please select your agreement degree with the following with the **existence or not** of the following barriers:

| Barriers                                   | Neither disagree or agree | Totally disagree | Disagree | Agree | Totally agree |
|--------------------------------------------|---------------------------|------------------|----------|-------|---------------|
| Heterogeneity of electronic health records |                           |                  |          |       |               |
| Data privacy risks                         |                           |                  |          |       |               |
| Legal restrictions                         |                           |                  |          |       |               |
| Lack of adequate infrastructure            |                           |                  |          |       |               |
| Cybersecurity risks                        |                           |                  |          |       |               |
| Lack of technical interoperability         |                           |                  |          |       |               |
| Data quality and reliability               |                           |                  |          |       |               |
| Lack of stakeholders' awareness            |                           |                  |          |       |               |
| Lack of stakeholders' interest             |                           |                  |          |       |               |

### Section 5 – Utility of the access to specific healthcare data

Do you consider the following data useful to achieve your personal and/or professional goals?

5.1 – Regarding the **data related to the patients' general information**, please classify the access to them according to their utility degree:

| <b>Data related to the patients' general information</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|----------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Allergies and intolerances                               |                   |                 |                   |        |             |
| Demography                                               |                   |                 |                   |        |             |
| Pregnancy                                                |                   |                 |                   |        |             |
| Habits                                                   |                   |                 |                   |        |             |
| Clinical and family history                              |                   |                 |                   |        |             |
| Identification                                           |                   |                 |                   |        |             |
| Death                                                    |                   |                 |                   |        |             |
| Pathologies                                              |                   |                 |                   |        |             |

5.2 – Regarding the **data related to the diagnostic and evaluation of patients' health**, please classify the access to them according to their utility degree:

| <b>Data related to the diagnostic and evaluation of patients' health</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|--------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Anthropometric evaluation                                                |                   |                 |                   |        |             |
| Laboratory tests                                                         |                   |                 |                   |        |             |
| Imaging exams                                                            |                   |                 |                   |        |             |
| Rapid tests                                                              |                   |                 |                   |        |             |
| Physical exams                                                           |                   |                 |                   |        |             |
| Electrocardiogram                                                        |                   |                 |                   |        |             |
| Vital parameters                                                         |                   |                 |                   |        |             |

5.3 – Regarding the **data related to the prevention and promotion of patients' health**, please classify the access to them according to their utility degree:

| <b>Data related to the prevention and promotion of patients' health</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Vaccination and immunization                                            |                   |                 |                   |        |             |
| Screenings                                                              |                   |                 |                   |        |             |

5.3 – Regarding the **data related to the prevention and promotion of patients' health**, please classify the access to them according to their utility degree:

| <b>Data related to the prevention and promotion of patients' health</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Diet                                                                    |                   |                 |                   |        |             |
| Physical activity                                                       |                   |                 |                   |        |             |
| Antimicrobial resistance                                                |                   |                 |                   |        |             |
| Smoking                                                                 |                   |                 |                   |        |             |
| Epidemiology                                                            |                   |                 |                   |        |             |

5.4 – Regarding the **data related to patients' treatments**, please classify the access to them according to their utility degree:

| <b>Data related to patients' treatments</b>         | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-----------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Medicines                                           |                   |                 |                   |        |             |
| Pharmaceutical products                             |                   |                 |                   |        |             |
| Medical consumables                                 |                   |                 |                   |        |             |
| Laboratory consumables                              |                   |                 |                   |        |             |
| Drug interactions                                   |                   |                 |                   |        |             |
| Dosage                                              |                   |                 |                   |        |             |
| Technical information about healthcare technologies |                   |                 |                   |        |             |

5.5 – Regarding the **data related to the accessibility of patients to healthcare services**, please classify the access to them according to their utility degree:

| <b>Data related to the accessibility of patients to healthcare services</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-----------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Access to emergency services                                                |                   |                 |                   |        |             |
| Access to appointments                                                      |                   |                 |                   |        |             |
| Access to treatments                                                        |                   |                 |                   |        |             |
| Access to surgeries                                                         |                   |                 |                   |        |             |

5.6 – Regarding the **data related to the financial resources spent on healthcare**, please classify the access to them according to their utility degree:

| <b>Data related to the financial resources spent on healthcare</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|--------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Cost with complementary diagnostic and therapeutic exams           |                   |                 |                   |        |             |
| Cost with medicines                                                |                   |                 |                   |        |             |

5.6 – Regarding the **data related to the financial resources spent on healthcare**, please classify the access to them according to their utility degree:

| <b>Data related to the financial resources spent on healthcare</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|--------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Cost with pharmaceutical products                                  |                   |                 |                   |        |             |
| Cost with medical consumables                                      |                   |                 |                   |        |             |
| Cost with laboratory consumables                                   |                   |                 |                   |        |             |
| Cost with human resources                                          |                   |                 |                   |        |             |

5.7 – Regarding the **data related to the temporal resources spent on healthcare**, please classify the access to them according to their utility degree:

| <b>Data related to the temporal resources spent on healthcare</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Average time of appointment                                       |                   |                 |                   |        |             |
| Average time of treatment                                         |                   |                 |                   |        |             |
| Average time of waiting                                           |                   |                 |                   |        |             |
| Average time of management and administration                     |                   |                 |                   |        |             |

### Section 6 – Importance of the access to specific healthcare data

Do you consider the following data important for the quality increase of healthcare provision?

6.1 – Regarding the **data related to the patients' general information**, please classify the access to them according to their importance degree:

| <b>Data related to the patients' general information</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|----------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Allergies and intolerances                               |                   |                 |                   |        |             |
| Demography                                               |                   |                 |                   |        |             |
| Pregnancy                                                |                   |                 |                   |        |             |
| Habits                                                   |                   |                 |                   |        |             |
| Clinical and family history                              |                   |                 |                   |        |             |
| Identification                                           |                   |                 |                   |        |             |
| Death                                                    |                   |                 |                   |        |             |
| Pathologies                                              |                   |                 |                   |        |             |

6.2 – Regarding the **data related to the diagnostic and evaluation of patients' health**, please classify the access to them according to their importance degree:

| <b>Data related to the diagnostic and evaluation of patients' health</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|--------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Anthropometric evaluation                                                |                   |                 |                   |        |             |
| Laboratory tests                                                         |                   |                 |                   |        |             |
| Imaging exams                                                            |                   |                 |                   |        |             |
| Rapid tests                                                              |                   |                 |                   |        |             |
| Physical exams                                                           |                   |                 |                   |        |             |
| Electrocardiogram                                                        |                   |                 |                   |        |             |
| Vital parameters                                                         |                   |                 |                   |        |             |

6.3 – Regarding the **data related to the prevention and promotion of patients' health**, please classify the access to them according to their importance degree:

| <b>Data related to the prevention and promotion of patients' health</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Vaccination and immunization                                            |                   |                 |                   |        |             |
| Screenings                                                              |                   |                 |                   |        |             |
| Diet                                                                    |                   |                 |                   |        |             |
| Physical activity                                                       |                   |                 |                   |        |             |
| Antimicrobial resistance                                                |                   |                 |                   |        |             |
| Smoking                                                                 |                   |                 |                   |        |             |
| Epidemiology                                                            |                   |                 |                   |        |             |

6.4 – Regarding the **data related to patients' treatments**, please classify the access to them according to their importance degree:

| <b>Data related to patients' treatments</b>         | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-----------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Medicines                                           |                   |                 |                   |        |             |
| Pharmaceutical products                             |                   |                 |                   |        |             |
| Medical consumables                                 |                   |                 |                   |        |             |
| Laboratory consumables                              |                   |                 |                   |        |             |
| Drug interactions                                   |                   |                 |                   |        |             |
| Dosage                                              |                   |                 |                   |        |             |
| Technical information about healthcare technologies |                   |                 |                   |        |             |

6.5 – Regarding the **data related to the accessibility of patients to healthcare services**, please classify the access to them according to their **importance degree**:

| <b>Data related to the accessibility of patients to healthcare services</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-----------------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Access to emergency services                                                |                   |                 |                   |        |             |
| Access to appointments                                                      |                   |                 |                   |        |             |
| Access to treatments                                                        |                   |                 |                   |        |             |
| Access to surgeries                                                         |                   |                 |                   |        |             |

6.6 – Regarding the **data related to the financial resources spent on healthcare**, please classify the access to them according to their **importance degree**:

| <b>Data related to the financial resources spent on healthcare</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|--------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Cost with complementary diagnostic and therapeutic exams           |                   |                 |                   |        |             |
| Cost with medicines                                                |                   |                 |                   |        |             |
| Cost with pharmaceutical products                                  |                   |                 |                   |        |             |
| Cost with medical consumables                                      |                   |                 |                   |        |             |
| Cost with laboratory consumables                                   |                   |                 |                   |        |             |
| Cost with human resources                                          |                   |                 |                   |        |             |

6.7 – Regarding the **data related to the temporal resources spent on healthcare**, please classify the access to them according to their **importance degree**:

| <b>Data related to the temporal resources spent on healthcare</b> | Not useful at all | Not very useful | Moderately useful | Useful | Very useful |
|-------------------------------------------------------------------|-------------------|-----------------|-------------------|--------|-------------|
| Average time of appointment                                       |                   |                 |                   |        |             |
| Average time of treatment                                         |                   |                 |                   |        |             |
| Average time of waiting                                           |                   |                 |                   |        |             |
| Average time of management and administration                     |                   |                 |                   |        |             |

## Section 7 – Stakeholders general information (Part II)

7.1 – In which of the following **municipalities of the Azores** do you live??

|                   |
|-------------------|
| Angra do Heroísmo |
| Calheta           |
| Corvo             |
| Horta             |
| Lagoa             |

7.1 – In which of the following **municipalities of the Azores** do you live??

Lajes Das Flores

Lajes Do Pico

Madalena

Nordeste

Ponta Delgada

Povoação

Praia Da Vitória

Ribeira Grande

Santa Cruz Da Graciosa

Santa Cruz Das Flores

São Roque Do Pico

Velas

Vila Do Porto

Vila Franca Do Campo

7.2 – In which of the following age groups do you belong?

18 years or under

19 to 24 years

25 to 34 years

35 to 44 years

45 to 54 years

55 to 64 years

65 years or over

7.3 – What is your gender?

Male

Female

I prefer not to answer

Other

Annex III – Deliberation n. ° 3/2024 of Ethics Committee of the University of the Azores

Figure 26. Deliberation n. ° 3/2024 of Ethics Committee of the University of the Azores

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div><div>UNIVERSIDADE DOS AÇORES</div><div>COMISSÃO DE ÉTICA</div></div><div><div>PARECER 3/2024</div><div><div>Registo: Distribuição pela distribuição UAC/2023/77205 - Pedido de Parecer sobre Projeto de Tese de Doutoramento</div><div>Requerente: Tiago Filipe Tavares Costa, estudante do Doutoramento em Ciências Económicas e Empresariais, da Faculdade de Economia e Gestão, da Universidade dos Açores</div><div>Titulo do Projeto: Healthcare Data Linkage Value Management</div></div></div></div> <div><div><div>Assinado por: <b>João Noronha Rodrigues</b><br/>Num. de identificação: 01930702<br/>Data: 2024.01.17 15:40:54-01'00'</div><div><div>Assinado por: <b>Patrícia Ventura Garcia</b><br/>Num. de identificação: 0808842<br/>Data: 2024.01.17 15:18:09-01'00'</div><div><div>Assinado por: <b>Sofia de Oliveira Major</b><br/>Num. de identificação: 11930702<br/>Data: 2024.01.17 18:05:54-01'00'</div><div><div>Assinado por: <b>Vitor Manuel da Costa Gonçalves</b><br/>Num. de identificação: 01930702<br/>Data: 2024.01.17 15:24:12-01'00'</div></div><div><div>Assinado por: <b>Magda Eugénia Pinheiro Brando da Costa Carvalho Teixeira</b><br/>Num. de identificação: 08660740<br/>Data: 2024.01.17 09:09-01'00'</div><div><div>Assinado por: <b>Alfredo Costa Marques Duarte</b><br/>Num. de identificação: 07696920<br/>Data: 2024.01.17 21:30:15-01'00'</div></div></div><div><div>Assim, a Comissão deliberou <b>aprovar</b> o projeto <i>Healthcare Data Linkage Value Management</i>, tal como submetido.</div><div><div>Os Membros da Comissão de Ética que deliberaram,</div><div><div>Porta Delgada, 16 de janeiro de 2024</div></div></div></div></div></div></div></div> | <div><div><div>UNIVERSIDADE DOS AÇORES</div><div>COMISSÃO DE ÉTICA</div></div><div><div>Assim, a Comissão deliberou <b>aprovar</b> o projeto <i>Healthcare Data Linkage Value Management</i>, tal como submetido.</div><div><div>Os Membros da Comissão de Ética que deliberaram,</div><div><div>Porta Delgada, 16 de janeiro de 2024</div></div></div></div><div><div><div>Assinado por: <b>João Noronha Rodrigues</b><br/>Num. de identificação: 01930702<br/>Data: 2024.01.17 15:40:54-01'00'</div><div><div>Assinado por: <b>Patrícia Ventura Garcia</b><br/>Num. de identificação: 0808842<br/>Data: 2024.01.17 15:18:09-01'00'</div><div><div>Assinado por: <b>Sofia de Oliveira Major</b><br/>Num. de identificação: 11930702<br/>Data: 2024.01.17 18:05:54-01'00'</div><div><div>Assinado por: <b>Vitor Manuel da Costa Gonçalves</b><br/>Num. de identificação: 01930702<br/>Data: 2024.01.17 15:24:12-01'00'</div></div><div><div>Assinado por: <b>Magda Eugénia Pinheiro Brando da Costa Carvalho Teixeira</b><br/>Num. de identificação: 08660740<br/>Data: 2024.01.17 09:09-01'00'</div><div><div>Assinado por: <b>Alfredo Costa Marques Duarte</b><br/>Num. de identificação: 07696920<br/>Data: 2024.01.17 21:30:15-01'00'</div></div></div><div><div>Assim, a Comissão deliberou <b>aprovar</b> o projeto <i>Healthcare Data Linkage Value Management</i>, tal como submetido.</div><div><div>Os Membros da Comissão de Ética que deliberaram,</div><div><div>Porta Delgada, 16 de janeiro de 2024</div></div></div></div></div></div></div></div></div> |
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# **Annex IV – Healthcare stakeholders’ perspectives about TAM’s constructs: standard deviation and number of answers**

Table 36. Healthcare stakeholders’ perspectives about TAM’s constructs: standard deviation and number of answers

| Primary information category                    | Secondary information category | Standard deviation |      |      |      |      |           | Number of answers |        |       |       |       |
|-------------------------------------------------|--------------------------------|--------------------|------|------|------|------|-----------|-------------------|--------|-------|-------|-------|
|                                                 |                                | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ | Hpro              | Pati   | Admi  | Mana  | Pmkr  |
| Perceived Usefulness (PU) <sup>a)</sup>         | PU_1                           | 1.24               | -    | 0.87 | 1.23 | 1.57 | 1.23      | 265               | -      | 18    | 22    | 10    |
|                                                 | PU_1P                          | -                  | 1.36 | -    | -    | -    | 1.36      | -                 | 391    | -     | -     | -     |
|                                                 | PU_2                           | 1.21               | -    | 1.30 | 1.31 | 1.46 | 1.32      | 265               | -      | 17    | 19    | 8     |
|                                                 | PU_2P                          | -                  | 1.30 | -    | -    | -    | 1.30      | -                 | 391    | -     | -     | -     |
|                                                 | PU_3                           | 1.20               | -    | 1.00 | 1.06 | 1.58 | 1.21      | 264               | -      | 18    | 20    | 8     |
|                                                 | PU_3P                          | -                  | 1.40 | -    | -    | -    | 1.40      | -                 | 391    | -     | -     | -     |
|                                                 | PU_4                           | 1.34               | -    | 1.29 | 1.23 | 1.41 | 1.32      | 262               | -      | 17    | 19    | 8     |
|                                                 | PU_4P                          | -                  | 1.36 | -    | -    | -    | 1.36      | -                 | 392    | -     | -     | -     |
|                                                 | PU_5                           | 1.18               | -    | 1.06 | 1.21 | 1.46 | 1.23      | 261               | -      | 18    | 19    | 8     |
|                                                 | PU_5P                          | -                  | 1.37 | -    | -    | -    | 1.37      | -                 | 393    | -     | -     | -     |
|                                                 | PU_6                           | 1.30               | -    | 1.00 | 1.02 | 1.46 | 1.19      | 263               | -      | 18    | 20    | 8     |
|                                                 | PU_6P                          | -                  | 1.36 | -    | -    | -    | 1.36      | -                 | 388    | -     | -     | -     |
| $\bar{X}$                                       |                                | 1.24               | 1.36 | 1.09 | 1.18 | 1.49 | -         | 263.33            | 391.00 | 17.67 | 19.83 | 8.33  |
| Perceived Ease of Use (PEU) <sup>a)</sup>       | PEU_1                          | 1.14               | 1.28 | 1.03 | 0.75 | 1.34 | 1.11      | 265               | 367    | 18    | 20    | 10    |
|                                                 | PEU_2                          | 1.21               | 1.30 | 0.94 | 1.13 | 1.32 | 1.18      | 264               | 362    | 17    | 20    | 10    |
|                                                 | PEU_3                          | 1.12               | 1.28 | 1.10 | 0.99 | 1.45 | 1.19      | 264               | 358    | 18    | 20    | 10    |
|                                                 | PEU_4                          | 1.16               | 1.27 | 1.04 | 1.20 | 1.34 | 1.20      | 263               | 360    | 18    | 19    | 10    |
|                                                 | PEU_5                          | 1.11               | 1.26 | 1.11 | 1.13 | 1.33 | 1.19      | 263               | 349    | 17    | 19    | 10    |
|                                                 | PEU_6                          | 1.26               | 1.31 | 1.21 | 1.08 | 1.26 | 1.22      | 263               | 353    | 18    | 18    | 10    |
| $\bar{X}$                                       |                                | 1.17               | 1.28 | 1.07 | 1.05 | 1.34 | -         | 263.67            | 358.17 | 17.67 | 19.33 | 10.00 |
| Behavioral Intention to Use (BIU) <sup>a)</sup> | BIU_1                          | 0.84               |      | 1.08 | 0.82 | 1.17 | 0.98      | 263               | -      | 18    | 19    | 6     |
|                                                 | BIU_1P                         | -                  | 1.20 | -    | -    | -    | 1.20      | -                 | 387    | -     | -     | -     |
|                                                 | BIU_1                          | 0.84               |      | 1.02 | 0.98 | 1.46 | 1.08      | 263               | -      | 18    | 20    | 7     |
|                                                 | BIU_2P                         | -                  | 1.23 | -    | -    | -    | 1.23      | -                 | 386    | -     | -     | -     |
| $\bar{X}$                                       |                                | 0.84               | 1.22 | 1.05 | 0.90 | 1.32 | -         | 263.00            | 386.50 | 18.00 | 19.50 | 6.50  |
| Attitude Toward Using (ATU) <sup>a)</sup>       | ATU_1                          | 0.99               | 1.02 | 0.87 | 0.75 | 1.27 | 0.98      | 265               | 384    | 18    | 21    | 9     |
|                                                 | ATU_2                          | 0.86               | 1.07 | 0.87 | 1.12 | 1.25 | 1.03      | 268               | 394    | 18    | 21    | 11    |
|                                                 | ATU_3                          | 0.71               | 0.95 | 0.73 | 1.07 | 0.93 | 0.88      | 268               | 401    | 18    | 21    | 11    |
|                                                 | ATU_4                          | 0.76               | 1.11 | 0.71 | 1.18 | 1.21 | 0.99      | 266               | 398    | 18    | 21    | 11    |
|                                                 | ATU_5                          | 0.79               | 1.10 | 0.86 | 0.93 | 1.23 | 0.98      | 262               | 382    | 17    | 21    | 10    |
|                                                 | ATU_6                          | 1.18               | 1.13 | 1.08 | 1.00 | 1.71 | 1.22      | 264               | 387    | 16    | 20    | 10    |
| $\bar{X}$                                       |                                | 0.88               | 1.06 | 0.85 | 1.01 | 1.27 | -         | 265.50            | 391.00 | 17.50 | 20.83 | 10.33 |

| Primary<br>information<br>category          | Secondary<br>information<br>category | Standard deviation |      |      |      |      |           | Number of answers |        |       |       |       |
|---------------------------------------------|--------------------------------------|--------------------|------|------|------|------|-----------|-------------------|--------|-------|-------|-------|
|                                             |                                      | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ | Hpro              | Pati   | Admi  | Mana  | Pmkr  |
| Actual System in<br>Use (ASU) <sup>b)</sup> | ASU_1                                | 1.12               | 0.99 | 1.13 | 1.30 | 0.70 | 1.05      | 271               | 415    | 18    | 22    | 11    |
|                                             | ASU_2                                | 1.09               | 0.96 | 1.19 | 1.44 | 0.70 | 1.08      | 271               | 415    | 18    | 22    | 11    |
|                                             | $\bar{X}$                            | 1.11               | 0.98 | 1.16 | 1.37 | 0.70 | -         | 271.00            | 415.00 | 18.00 | 22.00 | 11.00 |

a) 5-Likert agreement scale: 1 – Totally disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Totally agree

b) 5-Likert frequency scale: 1 – Never; 2 – Rarely; 3 – Occasionally; 4 – Frequently; 5 – Very frequently

## Annex V – Healthcare stakeholders’ perspectives about TAM’s constructs: agreement and frequency analysis (%)

Table 37. Healthcare stakeholders’ perspectives about TAM’s constructs: agreement and frequency analysis (%)

| Healthcare stakeholder | 5-point Likert scale (Agreement) | Perceived Usefulness (PU) <sup>a)</sup> |        |        |        |        |        |        |        |        |        |        |        |           |
|------------------------|----------------------------------|-----------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
|                        |                                  | PU_1                                    | PU_1P  | PU_2   | PU_2P  | PU_3   | PU_3P  | PU_4   | PU_4P  | PU_5   | PU_5P  | PU_6   | PU_6P  | $\bar{X}$ |
| Hpro                   | Totally disagree                 | 6.79%                                   | -      | 7.17%  | -      | 7.95%  | -      | 9.54%  | -      | 6.51%  | -      | 8.75%  | -      | 7.79%     |
| Pati                   |                                  | -                                       | 13.55% | -      | 17.65% | -      | 15.86% |        | 16.58% | -      | 17.30% |        | 14.95% | 15.98%    |
| Admi                   |                                  | 0.00%                                   | -      | 5.88%  | -      | 0.00%  | -      | 11.76% | -      | 5.56%  | -      | 5.56%  | -      | 4.79%     |
| Mana                   |                                  | 4.55%                                   | -      | 5.26%  | -      | 0.00%  | -      | 0.00%  | -      | 0.00%  | -      | 0.00%  | -      | 1.63%     |
| Pmkr                   |                                  | 20.00%                                  | -      | 25.00% | -      | 25.00% | -      | 25.00% | -      | 25.00% | -      | 25.00% | -      | 24.17%    |
| $\bar{X}$              |                                  | 7.83%                                   | 13.55% | 10.83% | 17.65% | 8.24%  | 15.86% | 11.58% | 16.58% | 9.27%  | 17.30% | 9.83%  | 14.95% | -         |
| Hpro                   | Disagree                         | 13.21%                                  | -      | 9.81%  | -      | 7.58%  | -      | 21.76% | -      | 11.11% | -      | 16.35% | -      | 13.30%    |
| Pati                   |                                  |                                         | 14.07% | -      | 19.18% | -      | 11.25% |        | 13.78% | -      | 12.98% |        | 15.46% | 14.45%    |
| Admi                   |                                  | 11.11%                                  | -      | 17.65% | -      | 11.11% | -      | 5.88%  | -      | 5.56%  | -      | 5.56%  | -      | 9.48%     |
| Mana                   |                                  | 13.64%                                  | -      | 15.79% | -      | 15.00% | -      | 26.32% | -      | 26.32% | -      | 15.00% | -      | 18.68%    |
| Pmkr                   |                                  | 0.00%                                   | -      | 12.50% | -      | 0.00%  | -      | 25.00% | -      | 0.00%  | -      | 0.00%  | -      | 6.25%     |
| $\bar{X}$              |                                  | 9.49%                                   | 14.07% | 13.94% | 19.18% | 8.42%  | 11.25% | 19.74% | 13.78% | 10.75% | 12.98% | 9.23%  | 15.46% | -         |
| Hpro                   | Neither disagree or agree        | 5.66%                                   | -      | 4.15%  | -      | 3.79%  | -      | 7.63%  | -      | 7.28%  | -      | 5.70%  | -      | 5.70%     |
| Pati                   |                                  |                                         | 12.79% | -      | 23.53% | -      | 13.55% |        | 17.60% | -      | 17.56% |        | 16.75% | 16.96%    |
| Admi                   |                                  | 5.56%                                   | -      | 5.88%  | -      | 16.67% | -      | 0.00%  | -      | 16.67% | -      | 11.11% | -      | 9.31%     |
| Mana                   |                                  | 4.55%                                   | -      | 0.00%  | -      | 0.00%  | -      | 5.26%  | -      | 0.00%  | -      | 0.00%  | -      | 1.63%     |
| Pmkr                   |                                  | 10.00%                                  | -      | 25.00% | -      | 25.00% | -      | 25.00% | -      | 25.00% | -      | 25.00% | -      | 22.50%    |
| $\bar{X}$              |                                  | 6.44%                                   | 12.79% | 8.76%  | 23.53% | 11.36% | 13.55% | 9.47%  | 17.60% | 12.24% | 17.56% | 10.45% | 16.75% | -         |
| Hpro                   | Agree                            | 38.49%                                  | -      | 40.75% | -      | 42.42% | -      | 34.35% | -      | 43.68% | -      | 39.16% | -      | 39.81%    |
| Pati                   |                                  |                                         | 34.27% | -      | 26.85% | -      | 32.74% |        | 32.65% | -      | 32.32% |        | 30.67% | 31.58%    |
| Admi                   |                                  | 61.11%                                  | -      | 35.29% | -      | 38.89% | -      | 52.94% | -      | 50.00% | -      | 61.11% | -      | 49.89%    |
| Mana                   |                                  | 31.82%                                  | -      | 26.32% | -      | 35.00% | -      | 31.58% | -      | 36.84% | -      | 45.00% | -      | 34.43%    |
| Pmkr                   |                                  | 30.00%                                  | -      | 25.00% | -      | 25.00% | -      | 12.50% | -      | 37.50% | -      | 37.50% | -      | 27.92%    |
| $\bar{X}$              |                                  | 40.35%                                  | 34.27% | 31.84% | 26.85% | 35.33% | 32.74% | 32.84% | 32.65% | 42.01% | 32.32% | 45.69% | 30.67% | -         |
| Hpro                   | Totally agree                    | 35.85%                                  | -      | 38.11% | -      | 38.26% | -      | 26.72% | -      | 31.42% | -      | 30.04% | -      | 33.40%    |
| Pati                   |                                  |                                         | 25.32% | -      | 12.79% | -      | 26.60% |        | 19.39% | -      | 19.85% |        | 22.16% | 21.02%    |
| Admi                   |                                  | 22.22%                                  | -      | 35.29% | -      | 33.33% | -      | 29.41% | -      | 22.22% | -      | 16.67% | -      | 26.53%    |
| Mana                   |                                  | 45.45%                                  | -      | 52.63% | -      | 50.00% | -      | 36.84% | -      | 36.84% | -      | 40.00% | -      | 43.63%    |
| Pmkr                   |                                  | 40.00%                                  | -      | 12.50% | -      | 25.00% | -      | 12.50% | -      | 12.50% | -      | 12.50% | -      | 19.17%    |
| $\bar{X}$              |                                  | 35.88%                                  | 25.32% | 34.63% | 12.79% | 36.65% | 26.60% | 26.37% | 19.39% | 25.75% | 19.85% | 24.80% | 22.16% | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

Table 37. (continued)

| Healthcare stakeholder | 5-point Likert scale<br>(Agreement) | Perceived Ease of Use (PEU) <sup>a)</sup> |        |        |        |        |        |           | Behavioral Intention to Use (BIU) <sup>a)</sup> |        |        |        |           |
|------------------------|-------------------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------------------------------------------|--------|--------|--------|-----------|
|                        |                                     | PEU_1                                     | PEU_2  | PEU_3  | PEU_4  | PEU_5  | PEU_6  | $\bar{X}$ | BIU_1                                           | BIU_1P | BIU_1  | BIU_2P | $\bar{X}$ |
| Hpro                   | Totally disagree                    | 6.04%                                     | 8.33%  | 3.41%  | 6.08%  | 4.18%  | 18.63% | 7.78%     | 2.66%                                           | -      | 1.90%  | -      | 2.28%     |
| Pati                   |                                     | 15.80%                                    | 15.19% | 14.80% | 13.61% | 14.33% | 17.85% | 15.26%    | -                                               | 9.30%  | -      | 9.07%  | 9.18%     |
| Admi                   |                                     | 5.56%                                     | 5.88%  | 5.56%  | 5.56%  | 5.88%  | 16.67% | 7.52%     | 5.56%                                           | -      | 5.56%  | -      | 5.56%     |
| Mana                   |                                     | 0.00%                                     | 5.00%  | 0.00%  | 10.53% | 5.26%  | 5.56%  | 4.39%     | 0.00%                                           | -      | 0.00%  | -      | 0.00%     |
| Pmkr                   |                                     | 20.00%                                    | 20.00% | 20.00% | 20.00% | 20.00% | 20.00% | 20.00%    | 0.00%                                           | -      | 14.29% | -      | 7.14%     |
| $\bar{X}$              |                                     | 9.48%                                     | 10.88% | 8.75%  | 11.16% | 9.93%  | 15.74% | -         | 2.05%                                           | 9.30%  | 5.44%  | 9.07%  | -         |
| Hpro                   | Disagree                            | 18.11%                                    | 23.48% | 23.48% | 25.86% | 25.10% | 35.74% | 25.30%    | 1.90%                                           | -      | 2.66%  | -      | 2.28%     |
| Pati                   |                                     | 15.53%                                    | 19.61% | 17.04% | 17.50% | 16.62% | 16.43% | 17.12%    | -                                               | 6.46%  | -      | 8.81%  | 7.63%     |
| Admi                   |                                     | 11.11%                                    | 11.76% | 16.67% | 16.67% | 23.53% | 16.67% | 16.07%    | 5.56%                                           | -      | 5.56%  | -      | 5.56%     |
| Mana                   |                                     | 15.00%                                    | 30.00% | 25.00% | 21.05% | 31.58% | 44.44% | 27.85%    | 5.26%                                           | -      | 10.00% | -      | 7.63%     |
| Pmkr                   |                                     | 0.00%                                     | 0.00%  | 10.00% | 30.00% | 10.00% | 30.00% | 13.33%    | 16.67%                                          | -      | 0.00%  | -      | 8.33%     |
| $\bar{X}$              |                                     | 11.95%                                    | 16.97% | 18.44% | 22.21% | 21.36% | 28.66% | -         | 7.35%                                           | 6.46%  | 4.55%  | 8.81%  | -         |
| Hpro                   | Neither disagree or agree           | 7.55%                                     | 6.44%  | 5.68%  | 7.60%  | 10.27% | 9.89%  | 7.90%     | 4.18%                                           | -      | 4.56%  | -      | 4.37%     |
| Pati                   |                                     | 19.07%                                    | 16.30% | 17.88% | 20.00% | 21.49% | 21.53% | 19.38%    | -                                               | 19.12% | -      | 18.39% | 18.76%    |
| Admi                   |                                     | 5.56%                                     | 0.00%  | 5.56%  | 5.56%  | 5.88%  | 11.11% | 5.61%     | 5.56%                                           | -      | 5.56%  | -      | 5.56%     |
| Mana                   |                                     | 5.00%                                     | 0.00%  | 0.00%  | 0.00%  | 5.26%  | 5.56%  | 2.64%     | 5.26%                                           | -      | 5.00%  | -      | 5.13%     |
| Pmkr                   |                                     | 20.00%                                    | 30.00% | 30.00% | 20.00% | 30.00% | 30.00% | 26.67%    | 16.67%                                          | -      | 14.29% | -      | 15.48%    |
| $\bar{X}$              |                                     | 11.44%                                    | 10.55% | 11.82% | 10.63% | 14.58% | 15.62% | -         | 7.92%                                           | 19.12% | 7.35%  | 18.39% | -         |
| Hpro                   | Agree                               | 52.08%                                    | 48.86% | 50.76% | 48.67% | 49.05% | 28.90% | 46.39%    | 49.81%                                          | -      | 43.35% | -      | 46.58%    |
| Pati                   |                                     | 37.33%                                    | 35.08% | 36.87% | 34.44% | 34.38% | 31.44% | 34.93%    | -                                               | 38.24% | -      | 35.75% | 37.00%    |
| Admi                   |                                     | 66.67%                                    | 82.35% | 61.11% | 66.67% | 58.82% | 55.56% | 65.20%    | 50.00%                                          | -      | 61.11% | -      | 55.56%    |
| Mana                   |                                     | 80.00%                                    | 60.00% | 65.00% | 63.16% | 52.63% | 44.44% | 60.87%    | 42.11%                                          | -      | 30.00% | -      | 36.05%    |
| Pmkr                   |                                     | 50.00%                                    | 40.00% | 20.00% | 20.00% | 30.00% | 10.00% | 28.33%    | 33.33%                                          | -      | 28.57% | -      | 30.95%    |
| $\bar{X}$              |                                     | 57.21%                                    | 53.26% | 46.75% | 46.59% | 44.98% | 34.07% | -         | 43.81%                                          | 38.24% | 40.76% | 35.75% | -         |
| Hpro                   | Totally agree                       | 16.23%                                    | 12.88% | 16.67% | 11.79% | 11.41% | 6.84%  | 12.63%    | 41.44%                                          | -      | 47.53% | -      | 44.49%    |
| Pati                   |                                     | 12.26%                                    | 13.81% | 13.41% | 14.44% | 13.18% | 12.75% | 13.31%    | -                                               | 26.87% | -      | 27.98% | 27.43%    |
| Admi                   |                                     | 11.11%                                    | 0.00%  | 11.11% | 5.56%  | 5.88%  | 0.00%  | 5.61%     | 33.33%                                          | -      | 22.22% | -      | 27.78%    |
| Mana                   |                                     | 0.00%                                     | 5.00%  | 10.00% | 5.26%  | 5.26%  | 0.00%  | 4.25%     | 47.37%                                          | -      | 55.00% | -      | 51.18%    |
| Pmkr                   |                                     | 10.00%                                    | 10.00% | 20.00% | 10.00% | 10.00% | 10.00% | 11.67%    | 33.33%                                          | -      | 42.86% | -      | 38.10%    |
| $\bar{X}$              |                                     | 9.92%                                     | 8.34%  | 14.24% | 9.41%  | 9.15%  | 5.92%  | -         | 38.87%                                          | 26.87% | 41.90% | 27.98% | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

Table 37. (continued)

| Healthcare stakeholder | 5-point Likert scale      | Attitude Toward Using (ATU) <sup>a)</sup> |        |        |        |        |        |           | 5-point Likert scale | Actual System in Use (ASU) <sup>b)</sup> |        |           |
|------------------------|---------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|----------------------|------------------------------------------|--------|-----------|
|                        | (Agreement)               | ATU_1                                     | ATU_2  | ATU_3  | ATU_4  | ATU_5  | ATU_6  | $\bar{X}$ | (Frequency)          | ASU_1                                    | ASU_2  | $\bar{X}$ |
| Hpro                   | Totally disagree          | 2.26%                                     | 1.49%  | 1.12%  | 1.50%  | 1.53%  | 4.92%  | 2.14%     | Never                | 3.69%                                    | 3.69%  | 3.69%     |
| Pati                   |                           | 4.43%                                     | 4.31%  | 2.99%  | 5.53%  | 5.76%  | 6.46%  | 4.91%     |                      | 28.43%                                   | 28.92% | 28.67%    |
| Admi                   |                           | 0.00%                                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%     |                      | 5.56%                                    | 5.56%  | 5.56%     |
| Mana                   |                           | 0.00%                                     | 4.76%  | 0.00%  | 4.76%  | 0.00%  | 0.00%  | 1.59%     |                      | 9.09%                                    | 13.64% | 11.36%    |
| Pmkr                   |                           | 11.11%                                    | 9.09%  | 0.00%  | 9.09%  | 0.00%  | 20.00% | 8.22%     |                      | 27.27%                                   | 27.27% | 27.27%    |
| $\bar{X}$              |                           | 3.56%                                     | 3.93%  | 0.82%  | 4.18%  | 1.46%  | 6.28%  | -         |                      | 14.81%                                   | 15.81% | -         |
| Hpro                   | Disagree                  | 11.32%                                    | 5.22%  | 1.12%  | 1.50%  | 1.91%  | 15.53% | 6.10%     | Rarely               | 7.38%                                    | 6.27%  | 6.83%     |
| Pati                   |                           | 6.77%                                     | 7.61%  | 4.24%  | 7.04%  | 6.54%  | 8.27%  | 6.75%     |                      | 39.04%                                   | 40.48% | 39.76%    |
| Admi                   |                           | 11.11%                                    | 11.11% | 5.56%  | 5.56%  | 11.76% | 25.00% | 11.68%    |                      | 27.78%                                   | 38.89% | 33.33%    |
| Mana                   |                           | 4.76%                                     | 9.52%  | 14.29% | 9.52%  | 9.52%  | 15.00% | 10.44%    |                      | 13.64%                                   | 13.64% | 13.64%    |
| Pmkr                   |                           | 0.00%                                     | 0.00%  | 9.09%  | 0.00%  | 20.00% | 10.00% | 6.52%     |                      | 54.55%                                   | 54.55% | 54.55%    |
| $\bar{X}$              |                           | 6.79%                                     | 6.69%  | 6.86%  | 4.72%  | 9.95%  | 14.76% | -         |                      | 28.48%                                   | 30.77% | -         |
| Hpro                   | Neither disagree or agree | 9.06%                                     | 3.73%  | 2.61%  | 4.14%  | 5.34%  | 10.61% | 5.91%     | Occasionally         | 10.33%                                   | 7.75%  | 9.04%     |
| Pati                   |                           | 18.23%                                    | 11.42% | 10.47% | 12.31% | 13.87% | 17.57% | 13.98%    |                      | 23.13%                                   | 22.89% | 23.01%    |
| Admi                   |                           | 5.56%                                     | 0.00%  | 0.00%  | 0.00%  | 5.88%  | 0.00%  | 1.91%     |                      | 27.78%                                   | 16.67% | 22.22%    |
| Mana                   |                           | 4.76%                                     | 0.00%  | 0.00%  | 4.76%  | 0.00%  | 0.00%  | 1.59%     |                      | 22.73%                                   | 9.09%  | 15.91%    |
| Pmkr                   |                           | 11.11%                                    | 9.09%  | 0.00%  | 0.00%  | 0.00%  | 10.00% | 5.03%     |                      | 18.18%                                   | 18.18% | 18.18%    |
| $\bar{X}$              |                           | 9.74%                                     | 4.85%  | 2.62%  | 4.24%  | 5.02%  | 7.64%  | -         |                      | 20.43%                                   | 14.92% | -         |
| Hpro                   | Agree                     | 52.83%                                    | 47.76% | 45.15% | 45.86% | 46.95% | 40.15% | 46.45%    | Frequently           | 21.40%                                   | 21.03% | 21.22%    |
| Pati                   |                           | 47.66%                                    | 43.65% | 45.64% | 42.21% | 42.67% | 42.12% | 43.99%    |                      | 6.99%                                    | 5.54%  | 6.27%     |
| Admi                   |                           | 61.11%                                    | 61.11% | 61.11% | 66.67% | 64.71% | 56.25% | 61.83%    |                      | 27.78%                                   | 27.78% | 27.78%    |
| Mana                   |                           | 57.14%                                    | 47.62% | 19.05% | 33.33% | 28.57% | 50.00% | 39.29%    |                      | 27.27%                                   | 31.82% | 29.55%    |
| Pmkr                   |                           | 44.44%                                    | 27.27% | 18.18% | 18.18% | 20.00% | 10.00% | 23.01%    |                      | 0.00%                                    | 0.00%  | 0.00%     |
| $\bar{X}$              |                           | 52.64%                                    | 45.48% | 37.83% | 41.25% | 40.58% | 39.70% | -         |                      | 16.69%                                   | 17.23% | -         |
| Hpro                   | Totally agree             | 24.53%                                    | 41.79% | 50.00% | 46.99% | 44.27% | 28.79% | 39.40%    | Very frequently      | 57.20%                                   | 61.25% | 59.23%    |
| Pati                   |                           | 22.92%                                    | 32.99% | 36.66% | 32.91% | 31.15% | 25.58% | 30.37%    |                      | 2.41%                                    | 2.17%  | 2.29%     |
| Admi                   |                           | 22.22%                                    | 27.78% | 33.33% | 27.78% | 17.65% | 18.75% | 24.58%    |                      | 11.11%                                   | 11.11% | 11.11%    |
| Mana                   |                           | 33.33%                                    | 38.10% | 66.67% | 47.62% | 61.90% | 35.00% | 47.10%    |                      | 27.27%                                   | 31.82% | 29.55%    |
| Pmkr                   |                           | 33.33%                                    | 54.55% | 72.73% | 72.73% | 60.00% | 50.00% | 57.22%    |                      | 0.00%                                    | 0.00%  | 0.00%     |
| $\bar{X}$              |                           | 27.27%                                    | 39.04% | 51.88% | 45.61% | 43.00% | 31.62% | -         |                      | 19.60%                                   | 21.27% | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

## Annex VI – Healthcare professionals’ perspectives about TAM’s constructs: standard deviation and number of answers

Table 38. Healthcare professionals’ perspectives about TAM’s constructs: standard deviation and number of answers

| Primary information category                    | Secondary information category | Standard deviation |      |      |      |      |      |      |           | Number of answers |       |        |       |       |       |       |
|-------------------------------------------------|--------------------------------|--------------------|------|------|------|------|------|------|-----------|-------------------|-------|--------|-------|-------|-------|-------|
|                                                 |                                | Phar               | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ | Phar              | Phys  | Nurs   | Sdtt  | Psyc  | Sht   | Nutr  |
| Perceived Usefulness (PU) <sup>a)</sup>         | PU_1                           | 0.99               | 1.45 | 1.25 | 0.93 | 1.04 | 0.93 | 1.55 | 1.16      | 35                | 58    | 104    | 32    | 11    | 15    | 10    |
|                                                 | PU_2                           | 1.28               | 1.22 | 1.30 | 0.92 | 1.14 | 0.70 | 1.37 | 1.13      | 35                | 58    | 104    | 32    | 11    | 15    | 10    |
|                                                 | PU_3                           | 1.17               | 1.26 | 1.30 | 0.91 | 1.19 | 0.68 | 1.10 | 1.09      | 36                | 58    | 103    | 31    | 11    | 15    | 10    |
|                                                 | PU_4                           | 1.33               | 1.39 | 1.36 | 1.11 | 1.55 | 1.22 | 1.43 | 1.34      | 35                | 58    | 103    | 32    | 10    | 14    | 10    |
|                                                 | PU_5                           | 1.38               | 1.19 | 1.18 | 0.88 | 1.27 | 0.77 | 1.41 | 1.16      | 36                | 57    | 102    | 31    | 11    | 14    | 10    |
|                                                 | PU_6                           | 1.31               | 1.26 | 1.31 | 1.31 | 1.43 | 1.19 | 1.35 | 1.31      | 36                | 58    | 102    | 32    | 11    | 14    | 10    |
|                                                 | $\bar{X}$                      | 1.24               | 1.30 | 1.29 | 1.01 | 1.27 | 0.91 | 1.37 | -         | 35.50             | 57.83 | 103.00 | 31.67 | 10.83 | 14.50 | 10.00 |
| Perceived Ease of Use (PEU) <sup>a)</sup>       | PEU_1                          | 1.25               | 1.32 | 1.08 | 0.93 | 0.75 | 0.70 | 0.97 | 1.00      | 36                | 58    | 104    | 32    | 11    | 15    | 9     |
|                                                 | PEU_2                          | 1.04               | 1.28 | 1.22 | 1.27 | 1.04 | 0.96 | 1.13 | 1.13      | 35                | 58    | 104    | 32    | 11    | 15    | 9     |
|                                                 | PEU_3                          | 0.99               | 1.22 | 1.10 | 1.29 | 0.98 | 0.92 | 0.97 | 1.07      | 35                | 58    | 104    | 32    | 11    | 15    | 9     |
|                                                 | PEU_4                          | 1.21               | 1.26 | 1.12 | 1.09 | 0.92 | 0.91 | 1.30 | 1.12      | 35                | 58    | 103    | 32    | 11    | 15    | 9     |
|                                                 | PEU_5                          | 1.07               | 1.23 | 1.02 | 1.09 | 0.98 | 1.20 | 1.12 | 1.10      | 35                | 58    | 104    | 32    | 11    | 14    | 9     |
|                                                 | PEU_6                          | 1.31               | 1.26 | 1.17 | 1.29 | 1.01 | 1.38 | 1.12 | 1.22      | 35                | 58    | 104    | 32    | 11    | 14    | 9     |
|                                                 | $\bar{X}$                      | 1.15               | 1.26 | 1.12 | 1.16 | 0.95 | 1.01 | 1.10 | -         | 35.17             | 58.00 | 103.83 | 32.00 | 11.00 | 14.67 | 9.00  |
| Behavioral Intention to Use (BIU) <sup>a)</sup> | BIU_1                          | 0.95               | 0.95 | 0.83 | 0.80 | 0.52 | 0.63 | 0.50 | 0.74      | 35                | 58    | 104    | 32    | 11    | 14    | 9     |
|                                                 | BIU_2                          | 0.95               | 0.97 | 0.73 | 0.90 | 0.93 | 0.63 | 0.67 | 0.83      | 35                | 58    | 104    | 32    | 11    | 14    | 9     |
|                                                 | $\bar{X}$                      | 0.95               | 0.96 | 0.78 | 0.85 | 0.73 | 0.63 | 0.58 | -         | 35.00             | 58.00 | 104.00 | 32.00 | 11.00 | 14.00 | 9.00  |
| Attitude Toward Using (ATU) <sup>a)</sup>       | ATU_1                          | 0.93               | 1.25 | 0.88 | 0.81 | 0.89 | 0.80 | 0.99 | 0.94      | 35                | 58    | 104    | 32    | 11    | 15    | 10    |
|                                                 | ATU_2                          | 0.80               | 1.07 | 0.84 | 0.49 | 0.95 | 0.80 | 0.52 | 0.78      | 37                | 58    | 104    | 32    | 12    | 15    | 10    |
|                                                 | ATU_3                          | 0.51               | 0.91 | 0.65 | 0.80 | 0.65 | 0.52 | 0.52 | 0.65      | 37                | 58    | 104    | 32    | 12    | 15    | 10    |
|                                                 | ATU_4                          | 0.55               | 1.04 | 0.67 | 0.79 | 0.50 | 0.52 | 0.70 | 0.68      | 36                | 58    | 104    | 32    | 11    | 15    | 10    |
|                                                 | ATU_5                          | 0.69               | 0.98 | 0.69 | 0.82 | 0.78 | 0.52 | 0.97 | 0.78      | 37                | 58    | 103    | 30    | 12    | 13    | 9     |
|                                                 | ATU_6                          | 0.83               | 1.41 | 1.13 | 1.09 | 1.21 | 0.83 | 1.12 | 1.09      | 35                | 58    | 104    | 32    | 11    | 15    | 9     |
|                                                 | $\bar{X}$                      | 0.72               | 1.11 | 0.81 | 0.80 | 0.83 | 0.66 | 0.80 | -         | 36.17             | 58.00 | 103.83 | 31.67 | 11.50 | 14.67 | 9.67  |
| Actual System in Use (ASU) <sup>b)</sup>        | ASU_1                          | 1.45               | 0.94 | 1.02 | 0.90 | 1.31 | 0.96 | 1.45 | 1.15      | 38                | 58    | 106    | 32    | 12    | 15    | 10    |
|                                                 | ASU_2                          | 1.36               | 0.86 | 1.02 | 0.92 | 1.31 | 0.91 | 1.45 | 1.12      | 38                | 58    | 106    | 32    | 12    | 15    | 10    |
|                                                 | $\bar{X}$                      | 1.41               | 0.90 | 1.02 | 0.91 | 1.31 | 0.94 | 1.45 | -         | 38.00             | 58.00 | 106.00 | 32.00 | 12.00 | 15.00 | 10.00 |

a) 5-Likert agreement scale: 1 – Totally disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Totally agree

b) 5-Likert frequency scale: 1 – Never; 2 – Rarely; 3 – Occasionally; 4 – Frequently; 5 – Very frequently

## Annex VII – Healthcare professionals’ perspectives about TAM’s constructs: agreement and frequency analysis (%)

Table 39. Healthcare professionals’ perspectives about TAM’s constructs: agreement and frequency analysis (%)

| Healthcare professional | 5-point Likert scale<br>(Agreement) | Perceived Usefulness (PU) <sup>a)</sup> |        |        |        |        |        |           |
|-------------------------|-------------------------------------|-----------------------------------------|--------|--------|--------|--------|--------|-----------|
|                         |                                     | PU_1                                    | PU_2   | PU_3   | PU_4   | PU_5   | PU_6   | $\bar{X}$ |
| Phar                    | Totally disagree                    | 5.71%                                   | 11.43% | 8.33%  | 11.43% | 11.11% | 8.33%  | 9.39%     |
| Phys                    |                                     | 12.07%                                  | 6.90%  | 8.62%  | 12.07% | 5.26%  | 8.62%  | 8.92%     |
| Nurs                    |                                     | 6.73%                                   | 8.65%  | 10.68% | 10.68% | 7.84%  | 9.80%  | 9.07%     |
| Sdtt                    |                                     | 0.00%                                   | 0.00%  | 3.23%  | 0.00%  | 0.00%  | 9.38%  | 2.10%     |
| Psyc                    |                                     | 9.09%                                   | 9.09%  | 9.09%  | 10.00% | 9.09%  | 9.09%  | 9.24%     |
| Sht                     |                                     | 0.00%                                   | 0.00%  | 0.00%  | 7.14%  | 0.00%  | 7.14%  | 2.38%     |
| Nutr                    |                                     | 10.00%                                  | 10.00% | 0.00%  | 10.00% | 10.00% | 0.00%  | 6.67%     |
| $\bar{X}$               |                                     | 6.23%                                   | 6.58%  | 5.71%  | 8.76%  | 6.19%  | 7.48%  | -         |
| Phar                    | Disagree                            | 0.00%                                   | 2.86%  | 0.00%  | 8.57%  | 13.89% | 13.89% | 6.53%     |
| Phys                    |                                     | 13.79%                                  | 10.34% | 8.62%  | 18.97% | 12.28% | 12.07% | 12.68%    |
| Nurs                    |                                     | 20.19%                                  | 14.42% | 10.68% | 27.18% | 11.76% | 20.59% | 17.47%    |
| Sdtt                    |                                     | 9.38%                                   | 9.38%  | 3.23%  | 21.88% | 9.68%  | 9.38%  | 10.48%    |
| Psyc                    |                                     | 0.00%                                   | 0.00%  | 9.09%  | 40.00% | 9.09%  | 18.18% | 12.73%    |
| Sht                     |                                     | 6.67%                                   | 0.00%  | 0.00%  | 14.29% | 0.00%  | 7.14%  | 4.68%     |
| Nutr                    |                                     | 20.00%                                  | 10.00% | 20.00% | 20.00% | 10.00% | 40.00% | 20.00%    |
| $\bar{X}$               |                                     | 10.00%                                  | 6.71%  | 7.37%  | 21.55% | 9.53%  | 17.32% | -         |
| Phar                    | Neither disagree or agree           | 5.71%                                   | 5.71%  | 11.11% | 5.71%  | 8.33%  | 5.56%  | 7.02%     |
| Phys                    |                                     | 8.62%                                   | 1.72%  | 1.72%  | 12.07% | 8.77%  | 5.17%  | 6.35%     |
| Nurs                    |                                     | 3.85%                                   | 3.85%  | 2.91%  | 6.80%  | 6.86%  | 6.86%  | 5.19%     |
| Sdtt                    |                                     | 3.13%                                   | 3.13%  | 0.00%  | 3.13%  | 0.00%  | 0.00%  | 1.56%     |
| Psyc                    |                                     | 0.00%                                   | 0.00%  | 0.00%  | 0.00%  | 9.09%  | 9.09%  | 3.03%     |
| Sht                     |                                     | 20.00%                                  | 20.00% | 13.33% | 21.43% | 21.43% | 14.29% | 18.41%    |
| Nutr                    |                                     | 0.00%                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%     |
| $\bar{X}$               |                                     | 5.90%                                   | 4.92%  | 4.15%  | 7.02%  | 7.78%  | 5.85%  | -         |
| Phar                    | Agree                               | 45.71%                                  | 40.00% | 30.56% | 40.00% | 33.33% | 36.11% | 37.62%    |
| Phys                    |                                     | 22.41%                                  | 39.66% | 37.93% | 29.31% | 38.60% | 43.10% | 35.17%    |
| Nurs                    |                                     | 44.23%                                  | 38.46% | 43.69% | 33.01% | 50.00% | 40.20% | 41.60%    |
| Sdtt                    |                                     | 34.38%                                  | 40.63% | 45.16% | 43.75% | 48.39% | 37.50% | 41.63%    |
| Psyc                    |                                     | 72.73%                                  | 54.55% | 63.64% | 20.00% | 45.45% | 27.27% | 47.27%    |
| Sht                     |                                     | 40.00%                                  | 53.33% | 53.33% | 35.71% | 42.86% | 42.86% | 44.68%    |
| Nutr                    |                                     | 20.00%                                  | 40.00% | 50.00% | 40.00% | 30.00% | 30.00% | 35.00%    |

| Healthcare professional | 5-point Likert scale<br>(Agreement) | Perceived Usefulness (PU) <sup>a)</sup> |        |        |        |        |        |           |
|-------------------------|-------------------------------------|-----------------------------------------|--------|--------|--------|--------|--------|-----------|
|                         |                                     | PU_1                                    | PU_2   | PU_3   | PU_4   | PU_5   | PU_6   | $\bar{X}$ |
| $\bar{X}$               |                                     | 39.92%                                  | 43.80% | 46.33% | 34.54% | 41.23% | 36.72% | -         |
| Phar                    | Totally agree                       | 42.86%                                  | 40.00% | 50.00% | 34.29% | 33.33% | 36.11% | 39.43%    |
| Phys                    |                                     | 43.10%                                  | 41.38% | 43.10% | 27.59% | 35.09% | 31.03% | 36.88%    |
| Nurs                    |                                     | 25.00%                                  | 34.62% | 32.04% | 22.33% | 23.53% | 22.55% | 26.68%    |
| Sdt                     |                                     | 53.13%                                  | 46.88% | 48.39% | 31.25% | 41.94% | 43.75% | 44.22%    |
| Psyc                    |                                     | 18.18%                                  | 36.36% | 18.18% | 30.00% | 27.27% | 36.36% | 27.73%    |
| Sht                     |                                     | 33.33%                                  | 26.67% | 33.33% | 21.43% | 35.71% | 28.57% | 29.84%    |
| Nutr                    |                                     | 50.00%                                  | 40.00% | 30.00% | 30.00% | 50.00% | 30.00% | 38.33%    |
| $\bar{X}$               |                                     | 37.94%                                  | 37.99% | 36.43% | 28.13% | 35.27% | 32.63% | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

Table 39. (continued)

| Healthcare professional | 5-point Likert scale<br>(Agreement) | Perceived Ease of Use (PEU) <sup>a)</sup> |        |        |        |        |        |           | Behavioral Intention to Use (BIU) <sup>a)</sup> |       |           |
|-------------------------|-------------------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------------------------------------------|-------|-----------|
|                         |                                     | PEU_1                                     | PEU_2  | PEU_3  | PEU_4  | PEU_5  | PEU_6  | $\bar{X}$ | BIU_1                                           | BIU_2 | $\bar{X}$ |
| Phar                    | Totally disagree                    | 11.11%                                    | 2.86%  | 2.86%  | 8.57%  | 5.71%  | 14.29% | 7.57%     | 5.71%                                           | 2.86% | 4.29%     |
| Phys                    |                                     | 12.07%                                    | 15.52% | 5.17%  | 8.62%  | 5.17%  | 34.48% | 13.51%    | 3.45%                                           | 3.45% | 3.45%     |
| Nurs                    |                                     | 3.85%                                     | 7.69%  | 2.88%  | 5.83%  | 2.88%  | 13.46% | 6.10%     | 1.92%                                           | 0.96% | 1.44%     |
| Sdt                     |                                     | 3.13%                                     | 12.50% | 6.25%  | 3.13%  | 6.25%  | 15.63% | 7.81%     | 3.13%                                           | 3.13% | 3.13%     |
| Psyc                    |                                     | 0.00%                                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 18.18% | 3.03%     | 0.00%                                           | 0.00% | 0.00%     |
| Sht                     |                                     | 0.00%                                     | 0.00%  | 0.00%  | 0.00%  | 7.14%  | 14.29% | 3.57%     | 0.00%                                           | 0.00% | 0.00%     |
| Nutr                    |                                     | 0.00%                                     | 0.00%  | 0.00%  | 11.11% | 0.00%  | 11.11% | 3.70%     | 0.00%                                           | 0.00% | 0.00%     |
| $\bar{X}$               |                                     | 4.31%                                     | 5.51%  | 2.45%  | 5.32%  | 3.88%  | 17.35% | -         | 2.03%                                           | 1.49% | -         |
| Phar                    | Disagree                            | 11.11%                                    | 14.29% | 11.43% | 22.86% | 17.14% | 25.71% | 17.09%    | 0.00%                                           | 5.71% | 2.86%     |
| Phys                    |                                     | 32.76%                                    | 27.59% | 24.14% | 39.66% | 43.10% | 34.48% | 33.62%    | 3.45%                                           | 3.45% | 3.45%     |
| Nurs                    |                                     | 19.23%                                    | 26.92% | 26.92% | 23.30% | 22.12% | 42.31% | 26.80%    | 2.88%                                           | 0.96% | 1.92%     |
| Sdt                     |                                     | 6.25%                                     | 15.63% | 21.88% | 18.75% | 12.50% | 21.88% | 16.15%    | 0.00%                                           | 3.13% | 1.57%     |
| Psyc                    |                                     | 9.09%                                     | 27.27% | 36.36% | 27.27% | 36.36% | 54.55% | 31.82%    | 0.00%                                           | 9.09% | 4.55%     |
| Sht                     |                                     | 6.67%                                     | 20.00% | 13.33% | 13.33% | 7.14%  | 28.57% | 14.84%    | 0.00%                                           | 0.00% | 0.00%     |
| Nutr                    |                                     | 11.11%                                    | 22.22% | 33.33% | 22.22% | 33.33% | 44.44% | 27.78%    | 0.00%                                           | 0.00% | 0.00%     |
| $\bar{X}$               |                                     | 13.75%                                    | 21.99% | 23.91% | 23.91% | 24.53% | 35.99% | -         | 0.90%                                           | 3.19% | -         |
| Phar                    | Neither disagree or agree           | 5.56%                                     | 8.57%  | 8.57%  | 2.86%  | 14.29% | 8.57%  | 8.07%     | 0.00%                                           | 0.00% | 0.00%     |
| Phys                    |                                     | 6.90%                                     | 6.90%  | 6.90%  | 10.34% | 8.62%  | 10.34% | 8.33%     | 5.17%                                           | 6.90% | 6.04%     |
| Nurs                    |                                     | 6.73%                                     | 6.73%  | 4.81%  | 5.83%  | 10.58% | 9.62%  | 7.38%     | 6.73%                                           | 5.77% | 6.25%     |
| Sdt                     |                                     | 3.13%                                     | 3.13%  | 0.00%  | 3.13%  | 3.13%  | 12.50% | 4.17%     | 0.00%                                           | 0.00% | 0.00%     |
| Psyc                    |                                     | 9.09%                                     | 0.00%  | 9.09%  | 9.09%  | 9.09%  | 9.09%  | 7.58%     | 0.00%                                           | 0.00% | 0.00%     |

| Healthcare professional | 5-point Likert scale<br>(Agreement) | Perceived Ease of Use (PEU) <sup>a)</sup> |        |        |        |        |        |           | Behavioral Intention to Use (BIU) <sup>a)</sup> |        |           |
|-------------------------|-------------------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------------------------------------------|--------|-----------|
|                         |                                     | PEU_1                                     | PEU_2  | PEU_3  | PEU_4  | PEU_5  | PEU_6  | $\bar{X}$ | BIU_1                                           | BIU_2  | $\bar{X}$ |
| Sht                     | Agree                               | 20.00%                                    | 0.00%  | 6.67%  | 26.67% | 21.43% | 7.14%  | 13.65%    | 7.14%                                           | 7.14%  | 7.14%     |
| Nutr                    |                                     | 22.22%                                    | 22.22% | 11.11% | 11.11% | 11.11% | 11.11% | 14.81%    | 0.00%                                           | 11.11% | 5.56%     |
| $\bar{X}$               |                                     | 10.52%                                    | 6.79%  | 6.73%  | 9.86%  | 11.18% | 9.77%  | -         | 2.72%                                           | 4.42%  | -         |
| Phar                    |                                     | 52.78%                                    | 54.29% | 57.14% | 54.29% | 54.29% | 40.00% | 52.13%    | 51.43%                                          | 45.71% | 48.57%    |
| Phys                    |                                     | 34.48%                                    | 43.10% | 43.10% | 27.59% | 29.31% | 13.79% | 31.90%    | 44.83%                                          | 39.66% | 42.25%    |
| Nurs                    |                                     | 55.77%                                    | 45.19% | 52.88% | 55.34% | 55.77% | 29.81% | 49.13%    | 51.92%                                          | 44.23% | 48.08%    |
| Sdtt                    |                                     | 59.38%                                    | 56.25% | 43.75% | 56.25% | 62.50% | 40.63% | 53.13%    | 43.75%                                          | 43.75% | 43.75%    |
| Psyc                    |                                     | 72.73%                                    | 63.64% | 54.55% | 63.64% | 54.55% | 18.18% | 54.55%    | 54.55%                                          | 27.27% | 40.91%    |
| Sht                     |                                     | 66.67%                                    | 66.67% | 60.00% | 46.67% | 35.71% | 35.71% | 51.90%    | 50.00%                                          | 50.00% | 50.00%    |
| Nutr                    |                                     | 44.44%                                    | 33.33% | 55.56% | 44.44% | 44.44% | 33.33% | 42.59%    | 66.67%                                          | 55.56% | 61.12%    |
| $\bar{X}$               |                                     | 55.18%                                    | 51.78% | 52.43% | 49.74% | 48.08% | 30.21% | -         | 51.88%                                          | 43.74% | -         |
| Phar                    | Totally agree                       | 19.44%                                    | 20.00% | 20.00% | 11.43% | 8.57%  | 11.43% | 15.15%    | 42.86%                                          | 45.71% | 44.29%    |
| Phys                    |                                     | 13.79%                                    | 6.90%  | 20.69% | 13.79% | 13.79% | 6.90%  | 12.64%    | 43.10%                                          | 46.55% | 44.83%    |
| Nurs                    |                                     | 14.42%                                    | 13.46% | 12.50% | 9.71%  | 8.65%  | 4.81%  | 10.59%    | 36.54%                                          | 48.08% | 42.31%    |
| Sdtt                    |                                     | 28.13%                                    | 12.50% | 28.13% | 18.75% | 15.63% | 9.38%  | 18.75%    | 53.13%                                          | 50.00% | 51.56%    |
| Psyc                    |                                     | 9.09%                                     | 9.09%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.03%     | 45.45%                                          | 63.64% | 54.55%    |
| Sht                     |                                     | 6.67%                                     | 13.33% | 20.00% | 13.33% | 28.57% | 14.29% | 16.03%    | 42.86%                                          | 42.86% | 42.86%    |
| Nutr                    |                                     | 22.22%                                    | 22.22% | 0.00%  | 11.11% | 11.11% | 0.00%  | 11.11%    | 33.33%                                          | 33.33% | 33.33%    |
| $\bar{X}$               |                                     | 16.25%                                    | 13.93% | 14.47% | 11.16% | 12.33% | 6.68%  | -         | 42.47%                                          | 47.17% | -         |

a) 5-Likert agreement scale  
b) 5-Likert frequency scale

Table 39. (continued)

| Healthcare professional | 5-point Likert scale<br>(Agreement) | Attitude Toward Using (ATU) <sup>a)</sup> |       |       |       |       |        |           | 5-point Likert scale<br>(Frequency) | Actual System in Use (ASU) <sup>b)</sup> |        |           |
|-------------------------|-------------------------------------|-------------------------------------------|-------|-------|-------|-------|--------|-----------|-------------------------------------|------------------------------------------|--------|-----------|
|                         |                                     | ATU_1                                     | ATU_2 | ATU_3 | ATU_4 | ATU_5 | ATU_6  | $\bar{X}$ |                                     | ASU_1                                    | ASU_2  | $\bar{X}$ |
| Phar                    | Totally disagree                    | 2.86%                                     | 2.70% | 0.00% | 0.00% | 0.00% | 0.00%  | 0.93%     | Never                               | 13.16%                                   | 10.53% | 11.84%    |
| Phys                    |                                     | 6.90%                                     | 5.17% | 3.45% | 5.17% | 5.17% | 15.52% | 6.90%     |                                     | 0.00%                                    | 0.00%  | 0.00%     |
| Nurs                    |                                     | 0.96%                                     | 0.00% | 0.00% | 0.00% | 0.00% | 2.88%  | 0.64%     |                                     | 2.83%                                    | 2.83%  | 2.83%     |
| Sdtt                    |                                     | 0.00%                                     | 0.00% | 3.13% | 3.13% | 3.33% | 3.13%  | 2.12%     |                                     | 0.00%                                    | 3.13%  | 1.56%     |
| Psyc                    |                                     | 0.00%                                     | 0.00% | 0.00% | 0.00% | 0.00% | 0.00%  | 0.00%     |                                     | 8.33%                                    | 8.33%  | 8.33%     |
| Sht                     |                                     | 0.00%                                     | 0.00% | 0.00% | 0.00% | 0.00% | 0.00%  | 0.00%     |                                     | 0.00%                                    | 0.00%  | 0.00%     |
| Nutr                    |                                     | 0.00%                                     | 0.00% | 0.00% | 0.00% | 0.00% | 0.00%  | 0.00%     |                                     | 10.00%                                   | 10.00% | 10.00%    |
| $\bar{X}$               |                                     | 1.53%                                     | 1.13% | 0.94% | 1.19% | 1.22% | 3.08%  | -         |                                     | 4.90%                                    | 4.97%  | -         |
| Phar                    | Disagree                            | 5.71%                                     | 0.00% | 0.00% | 0.00% | 2.70% | 5.71%  | 2.36%     | Rarely                              | 15.79%                                   | 13.16% | 14.47%    |
| Phys                    |                                     | 22.41%                                    | 6.90% | 1.72% | 3.45% | 1.72% | 18.97% | 9.20%     |                                     | 8.62%                                    | 5.17%  | 6.90%     |
| Nurs                    |                                     | 9.62%                                     | 7.69% | 1.92% | 1.92% | 1.94% | 17.31% | 6.73%     |                                     | 4.72%                                    | 5.66%  | 5.19%     |

| Healthcare professional | 5-point Likert scale      | Attitude Toward Using (ATU) <sup>a)</sup> |        |        |        |        |        |           | 5-point Likert scale | Actual System in Use (ASU) <sup>b)</sup> |        |           |
|-------------------------|---------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|----------------------|------------------------------------------|--------|-----------|
|                         | (Agreement)               | ATU_1                                     | ATU_2  | ATU_3  | ATU_4  | ATU_5  | ATU_6  | $\bar{X}$ | (Frequency)          | ASU_1                                    | ASU_2  | $\bar{X}$ |
| Sdt                     |                           | 6.25%                                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 9.38%  | 2.60%     |                      | 3.13%                                    | 0.00%  | 1.56%     |
| Psyc                    |                           | 9.09%                                     | 8.33%  | 0.00%  | 0.00%  | 0.00%  | 36.36% | 8.96%     |                      | 8.33%                                    | 8.33%  | 8.33%     |
| Sht                     |                           | 6.67%                                     | 6.67%  | 0.00%  | 0.00%  | 0.00%  | 6.67%  | 3.33%     |                      | 6.67%                                    | 6.67%  | 6.67%     |
| Nutr                    |                           | 10.00%                                    | 0.00%  | 0.00%  | 0.00%  | 11.11% | 22.22% | 7.22%     |                      | 10.00%                                   | 10.00% | 10.00%    |
| $\bar{X}$               |                           | 9.96%                                     | 4.23%  | 0.52%  | 0.77%  | 2.50%  | 16.66% | -         |                      | 8.18%                                    | 7.00%  | -         |
| Phar                    | Neither disagree or agree | 2.86%                                     | 2.70%  | 0.00%  | 2.78%  | 2.70%  | 11.43% | 3.74%     | Occasionally         | 15.79%                                   | 13.16% | 14.47%    |
| Phys                    |                           | 6.90%                                     | 5.17%  | 3.45%  | 6.90%  | 5.17%  | 10.34% | 6.32%     |                      | 5.17%                                    | 8.62%  | 6.90%     |
| Nurs                    |                           | 11.54%                                    | 3.85%  | 3.85%  | 4.81%  | 7.77%  | 12.50% | 7.38%     |                      | 9.43%                                    | 5.66%  | 7.55%     |
| Sdt                     |                           | 6.25%                                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 6.25%  | 2.08%     |                      | 18.75%                                   | 9.38%  | 14.06%    |
| Psyc                    |                           | 9.09%                                     | 16.67% | 8.33%  | 0.00%  | 16.67% | 9.09%  | 9.97%     |                      | 0.00%                                    | 0.00%  | 0.00%     |
| Sht                     |                           | 13.33%                                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 6.67%  | 3.33%     |                      | 13.33%                                   | 6.67%  | 10.00%    |
| Nutr                    |                           | 20.00%                                    | 0.00%  | 0.00%  | 10.00% | 0.00%  | 11.11% | 6.85%     |                      | 10.00%                                   | 10.00% | 10.00%    |
| $\bar{X}$               |                           | 10.00%                                    | 4.06%  | 2.23%  | 3.50%  | 4.62%  | 9.63%  | -         |                      | 10.35%                                   | 7.64%  | -         |
| Phar                    | Agree                     | 54.29%                                    | 43.24% | 48.65% | 55.56% | 40.54% | 48.57% | 48.47%    | Frequently           | 21.05%                                   | 28.95% | 25.00%    |
| Phys                    |                           | 43.10%                                    | 50.00% | 39.66% | 44.83% | 50.00% | 32.76% | 43.39%    |                      | 20.69%                                   | 13.79% | 17.24%    |
| Nurs                    |                           | 57.69%                                    | 50.00% | 50.00% | 48.08% | 50.49% | 40.38% | 49.44%    |                      | 20.75%                                   | 19.81% | 20.28%    |
| Sdt                     |                           | 53.13%                                    | 37.50% | 34.38% | 25.00% | 40.00% | 37.50% | 37.92%    |                      | 18.75%                                   | 21.88% | 20.31%    |
| Psyc                    |                           | 54.55%                                    | 41.67% | 50.00% | 63.64% | 33.33% | 36.36% | 46.59%    |                      | 33.33%                                   | 33.33% | 33.33%    |
| Sht                     |                           | 60.00%                                    | 53.33% | 46.67% | 46.67% | 53.85% | 53.33% | 52.31%    |                      | 26.67%                                   | 26.67% | 26.67%    |
| Nutr                    |                           | 40.00%                                    | 60.00% | 40.00% | 40.00% | 44.44% | 44.44% | 44.81%    |                      | 20.00%                                   | 20.00% | 20.00%    |
| $\bar{X}$               |                           | 51.82%                                    | 47.96% | 44.19% | 46.25% | 44.66% | 41.91% | -         |                      | 23.04%                                   | 23.49% | -         |
| Phar                    | Totally agree             | 34.29%                                    | 51.35% | 51.35% | 41.67% | 54.05% | 34.29% | 44.50%    | Very frequently      | 34.21%                                   | 34.21% | 34.21%    |
| Phys                    |                           | 20.69%                                    | 32.76% | 51.72% | 39.66% | 37.93% | 22.41% | 34.20%    |                      | 65.52%                                   | 72.41% | 68.97%    |
| Nurs                    |                           | 20.19%                                    | 38.46% | 44.23% | 45.19% | 39.81% | 26.92% | 35.80%    |                      | 62.26%                                   | 66.04% | 64.15%    |
| Sdt                     |                           | 34.38%                                    | 62.50% | 62.50% | 71.88% | 56.67% | 43.75% | 55.28%    |                      | 59.38%                                   | 65.63% | 62.50%    |
| Psyc                    |                           | 27.27%                                    | 33.33% | 41.67% | 36.36% | 50.00% | 18.18% | 34.47%    |                      | 50.00%                                   | 50.00% | 50.00%    |
| Sht                     |                           | 20.00%                                    | 40.00% | 53.33% | 53.33% | 46.15% | 33.33% | 41.03%    |                      | 53.33%                                   | 60.00% | 56.67%    |
| Nutr                    |                           | 30.00%                                    | 40.00% | 60.00% | 50.00% | 44.44% | 22.22% | 41.11%    |                      | 50.00%                                   | 50.00% | 50.00%    |
| $\bar{X}$               |                           | 26.69%                                    | 42.63% | 52.12% | 48.30% | 47.01% | 28.73% | -         |                      | 53.53%                                   | 56.90% | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

## Annex VIII – Patients’ perspectives by age group about TAM’s constructs: standard deviation and number of answers

Table 40. Patients’ perspectives by age group about TAM’s constructs: standard deviation and number of answers

| Primary information category                    | Secondary information category | Standard deviation |         |         |         |         |         |      |           | Number of answers |         |         |         |         |         |       |  |
|-------------------------------------------------|--------------------------------|--------------------|---------|---------|---------|---------|---------|------|-----------|-------------------|---------|---------|---------|---------|---------|-------|--|
|                                                 |                                | ≤ 18               | 19 – 24 | 25 – 34 | 35 – 44 | 45 – 54 | 55 – 64 | ≥ 65 | $\bar{X}$ | ≤ 18              | 19 – 24 | 25 – 34 | 35 – 44 | 45 – 54 | 55 – 64 | ≥ 65  |  |
| Perceived Usefulness (PU) <sup>a)</sup>         | PU_1P                          | 0.00               | 1.18    | 1.23    | 1.38    | 1.41    | 1.47    | 1.28 | 1.14      | 2                 | 17      | 51      | 121     | 108     | 63      | 29    |  |
|                                                 | PU_2P                          | 0.00               | 1.17    | 1.27    | 1.31    | 1.33    | 1.34    | 1.17 | 1.08      | 2                 | 19      | 50      | 122     | 105     | 64      | 29    |  |
|                                                 | PU_3P                          | 0.00               | 1.40    | 1.36    | 1.39    | 1.40    | 1.55    | 1.21 | 1.19      | 2                 | 18      | 51      | 123     | 108     | 61      | 28    |  |
|                                                 | PU_4P                          | 0.00               | 1.16    | 1.30    | 1.34    | 1.42    | 1.48    | 1.21 | 1.13      | 2                 | 19      | 50      | 122     | 107     | 63      | 29    |  |
|                                                 | PU_5P                          | 0.00               | 1.12    | 1.32    | 1.40    | 1.43    | 1.42    | 1.22 | 1.13      | 2                 | 19      | 50      | 123     | 108     | 64      | 27    |  |
|                                                 | PU_6P                          | 0.00               | 1.08    | 1.31    | 1.36    | 1.41    | 1.46    | 1.34 | 1.14      | 2                 | 19      | 50      | 121     | 105     | 63      | 28    |  |
|                                                 | $\bar{X}$                      | 0.00               | 1.18    | 1.30    | 1.36    | 1.40    | 1.45    | 1.24 | -         | 2.00              | 18.50   | 50.33   | 122.00  | 106.83  | 63.00   | 28.33 |  |
| Perceived Ease of Use (PEU) <sup>a)</sup>       | PEU_1                          | 0.71               | 1.18    | 1.22    | 1.25    | 1.29    | 1.44    | 1.18 | 1.18      | 2                 | 18      | 49      | 109     | 101     | 61      | 27    |  |
|                                                 | PEU_2                          | 0.71               | 1.08    | 1.20    | 1.22    | 1.34    | 1.50    | 1.31 | 1.19      | 2                 | 18      | 48      | 107     | 100     | 61      | 26    |  |
|                                                 | PEU_3                          | 0.71               | 0.98    | 1.23    | 1.24    | 1.28    | 1.48    | 1.27 | 1.17      | 2                 | 18      | 48      | 108     | 98      | 59      | 25    |  |
|                                                 | PEU_4                          | 0.71               | 1.07    | 1.32    | 1.20    | 1.34    | 1.38    | 1.16 | 1.17      | 2                 | 18      | 47      | 109     | 99      | 59      | 26    |  |
|                                                 | PEU_5                          | 0.71               | 1.04    | 1.22    | 1.19    | 1.33    | 1.41    | 1.24 | 1.16      | 2                 | 18      | 48      | 103     | 97      | 56      | 25    |  |
|                                                 | PEU_6                          | 0.71               | 1.06    | 1.24    | 1.28    | 1.36    | 1.47    | 1.14 | 1.18      | 2                 | 18      | 48      | 107     | 96      | 57      | 25    |  |
|                                                 | $\bar{X}$                      | 0.71               | 1.07    | 1.24    | 1.23    | 1.33    | 1.44    | 1.22 | -         | 2.00              | 18.00   | 48.00   | 107.17  | 98.50   | 58.83   | 25.67 |  |
| Behavioral Intention to Use (BIU) <sup>a)</sup> | BIU_1P                         | 0.71               | 0.77    | 1.15    | 1.12    | 1.26    | 1.33    | 1.35 | 1.10      | 2                 | 18      | 50      | 117     | 107     | 65      | 28    |  |
|                                                 | BIU_2P                         | 0.71               | 0.79    | 1.06    | 1.16    | 1.32    | 1.37    | 1.35 | 1.11      | 2                 | 17      | 49      | 118     | 105     | 67      | 28    |  |
|                                                 | $\bar{X}$                      | 0.71               | 0.78    | 1.11    | 1.14    | 1.29    | 1.35    | 1.35 | -         | 2.00              | 17.50   | 49.50   | 117.50  | 106.00  | 66.00   | 28.00 |  |
| Attitude Toward Using (ATU) <sup>a)</sup>       | ATU_1                          | 0.71               | 1.02    | 0.91    | 1.02    | 1.08    | 1.09    | 0.80 | 0.95      | 2                 | 19      | 49      | 117     | 103     | 66      | 28    |  |
|                                                 | ATU_2                          | 0.71               | 1.05    | 0.93    | 1.00    | 1.14    | 1.20    | 0.99 | 1.00      | 2                 | 19      | 50      | 122     | 104     | 68      | 29    |  |
|                                                 | ATU_3                          | 0.71               | 1.02    | 0.92    | 0.91    | 0.98    | 1.01    | 0.83 | 0.91      | 2                 | 19      | 51      | 124     | 107     | 68      | 30    |  |
|                                                 | ATU_4                          | 0.58               | 0.95    | 1.00    | 1.02    | 1.26    | 1.19    | 1.00 | 1.00      | 3                 | 19      | 51      | 122     | 106     | 68      | 29    |  |
|                                                 | ATU_5                          | 0.71               | 0.96    | 0.97    | 1.02    | 1.23    | 1.27    | 0.83 | 1.00      | 2                 | 19      | 50      | 120     | 99      | 64      | 28    |  |
|                                                 | ATU_6                          | 0.58               | 0.92    | 0.97    | 1.11    | 1.27    | 1.20    | 0.90 | 0.99      | 3                 | 18      | 51      | 120     | 98      | 68      | 29    |  |
|                                                 | $\bar{X}$                      | 0.66               | 0.99    | 0.95    | 1.01    | 1.16    | 1.16    | 0.89 | -         | 2.33              | 18.83   | 50.33   | 120.83  | 102.83  | 67.00   | 28.83 |  |
| Actual System in Use (ASU) <sup>b)</sup>        | ASU_1                          | 1.73               | 1.43    | 0.99    | 0.94    | 0.98    | 0.96    | 0.98 | 1.15      | 3                 | 19      | 52      | 126     | 111     | 71      | 33    |  |
|                                                 | ASU_2                          | 1.73               | 1.27    | 0.98    | 0.93    | 0.98    | 0.90    | 0.85 | 1.09      | 3                 | 19      | 52      | 126     | 111     | 71      | 33    |  |
|                                                 | $\bar{X}$                      | 1.73               | 1.35    | 0.98    | 0.93    | 0.98    | 0.93    | 0.91 | -         | 3.00              | 19.00   | 52.00   | 126.00  | 111.00  | 71.00   | 33.00 |  |

a) 5-Likert agreement scale: 1 – Totally disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Totally agree

b) 5-Likert frequency scale: 1 – Never; 2 – Rarely; 3 – Occasionally; 4 – Frequently; 5 – Very frequently

## Annex IX – Patients’ perspectives by age group about TAM’s constructs: agreement and frequency analysis (%)

Table 41. Patients’ perspectives by age group about TAM’s constructs: agreement and frequency analysis (%)

| Age group | 5-point Likert scale<br>(Agreement) | Perceived Usefulness (PU) <sup>a)</sup> |         |         |         |         |         |           |
|-----------|-------------------------------------|-----------------------------------------|---------|---------|---------|---------|---------|-----------|
|           |                                     | PU_1P                                   | PU_2P   | PU_3P   | PU_4P   | PU_5P   | PU_6P   | $\bar{X}$ |
| ≤ 18      | Totally disagree                    | 0.00%                                   | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.00%     |
| 19 – 24   |                                     | 5.88%                                   | 10.53%  | 16.67%  | 10.53%  | 5.26%   | 5.26%   | 9.02%     |
| 25 – 34   |                                     | 9.80%                                   | 18.00%  | 15.69%  | 14.00%  | 14.00%  | 14.00%  | 14.25%    |
| 35 – 44   |                                     | 15.70%                                  | 17.21%  | 16.26%  | 18.03%  | 18.70%  | 15.70%  | 16.94%    |
| 45 – 54   |                                     | 13.89%                                  | 18.10%  | 13.89%  | 16.82%  | 19.44%  | 16.19%  | 16.39%    |
| 55 – 64   |                                     | 15.87%                                  | 25.00%  | 22.95%  | 22.22%  | 21.88%  | 19.05%  | 21.16%    |
| ≥ 65      |                                     | 10.34%                                  | 6.90%   | 7.14%   | 6.90%   | 7.41%   | 7.14%   | 7.64%     |
| $\bar{X}$ |                                     | 10.21%                                  | 13.68%  | 13.23%  | 12.64%  | 12.38%  | 11.05%  | -         |
| ≤ 18      | Disagree                            | 0.00%                                   | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.00%     |
| 19 – 24   |                                     | 23.53%                                  | 21.05%  | 16.67%  | 15.79%  | 21.05%  | 26.32%  | 20.73%    |
| 25 – 34   |                                     | 15.69%                                  | 18.00%  | 13.73%  | 12.00%  | 12.00%  | 14.00%  | 14.24%    |
| 35 – 44   |                                     | 12.40%                                  | 18.03%  | 8.94%   | 12.30%  | 12.20%  | 18.18%  | 13.67%    |
| 45 – 54   |                                     | 16.67%                                  | 23.81%  | 12.96%  | 17.76%  | 12.04%  | 12.38%  | 15.94%    |
| 55 – 64   |                                     | 12.70%                                  | 15.63%  | 11.48%  | 12.70%  | 14.06%  | 12.70%  | 13.21%    |
| ≥ 65      |                                     | 6.90%                                   | 17.24%  | 7.14%   | 10.34%  | 14.81%  | 17.86%  | 12.38%    |
| $\bar{X}$ |                                     | 12.55%                                  | 16.25%  | 10.13%  | 11.55%  | 12.31%  | 14.49%  | -         |
| ≤ 18      | Neither disagree or agree           | 0.00%                                   | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.00%     |
| 19 – 24   |                                     | 0.00%                                   | 15.79%  | 11.11%  | 10.53%  | 10.53%  | 15.79%  | 10.62%    |
| 25 – 34   |                                     | 19.61%                                  | 32.00%  | 15.69%  | 20.00%  | 18.00%  | 22.00%  | 21.22%    |
| 35 – 44   |                                     | 13.22%                                  | 24.59%  | 13.01%  | 19.67%  | 17.07%  | 17.36%  | 17.49%    |
| 45 – 54   |                                     | 12.96%                                  | 19.05%  | 13.89%  | 15.89%  | 16.67%  | 15.24%  | 15.62%    |
| 55 – 64   |                                     | 7.94%                                   | 21.88%  | 8.20%   | 14.29%  | 18.75%  | 14.29%  | 14.22%    |
| ≥ 65      |                                     | 17.24%                                  | 31.03%  | 25.00%  | 24.14%  | 25.93%  | 17.86%  | 23.53%    |
| $\bar{X}$ |                                     | 10.14%                                  | 20.62%  | 12.41%  | 14.93%  | 15.28%  | 14.65%  | -         |
| ≤ 18      | Agree                               | 100.00%                                 | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00%   |
| 19 – 24   |                                     | 58.82%                                  | 47.37%  | 38.89%  | 57.89%  | 52.63%  | 47.37%  | 50.50%    |
| 25 – 34   |                                     | 37.25%                                  | 20.00%  | 35.29%  | 36.00%  | 36.00%  | 32.00%  | 32.76%    |
| 35 – 44   |                                     | 35.54%                                  | 25.41%  | 35.77%  | 34.43%  | 31.71%  | 29.75%  | 32.10%    |
| 45 – 54   |                                     | 28.70%                                  | 25.71%  | 28.70%  | 26.17%  | 29.63%  | 30.48%  | 28.23%    |
| 55 – 64   |                                     | 30.16%                                  | 28.13%  | 29.51%  | 28.57%  | 28.13%  | 28.57%  | 28.84%    |
| ≥ 65      |                                     | 34.48%                                  | 27.59%  | 28.57%  | 31.03%  | 29.63%  | 21.43%  | 28.79%    |
| $\bar{X}$ |                                     | 46.42%                                  | 39.17%  | 42.39%  | 44.87%  | 43.96%  | 41.37%  | -         |



| Age group | 5-point Likert scale<br>(Agreement) | Perceived Ease of Use (PEU) <sup>a)</sup> |        |        |        |        |        |           | Behavioral Intention to Use (BIU) <sup>a)</sup> |        |           |
|-----------|-------------------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------------------------------------------|--------|-----------|
|           |                                     | PEU_1                                     | PEU_2  | PEU_3  | PEU_4  | PEU_5  | PEU_6  | $\bar{X}$ | BIU_1P                                          | BIU_2P | $\bar{X}$ |
| 55 – 64   |                                     | 13.11%                                    | 8.20%  | 11.86% | 13.56% | 12.50% | 12.28% | 11.92%    | 18.46%                                          | 17.91% | 18.19%    |
| ≥ 65      |                                     | 33.33%                                    | 26.92% | 28.00% | 30.77% | 36.00% | 36.00% | 31.84%    | 25.00%                                          | 25.00% | 25.00%    |
| $\bar{X}$ |                                     | 24.68%                                    | 20.57% | 23.81% | 24.79% | 26.29% | 26.64% | -         | 25.37%                                          | 25.21% | -         |
| ≤ 18      | Agree                               | 0.00%                                     | 50.00% | 0.00%  | 50.00% | 0.00%  | 50.00% | 25.00%    | 0.00%                                           | 0.00%  | 0.00%     |
| 19 – 24   |                                     | 44.44%                                    | 38.89% | 44.44% | 38.89% | 44.44% | 44.44% | 42.59%    | 50.00%                                          | 47.06% | 48.53%    |
| 25 – 34   |                                     | 34.69%                                    | 41.67% | 35.42% | 23.40% | 27.08% | 25.00% | 31.21%    | 52.00%                                          | 53.06% | 52.53%    |
| 35 – 44   |                                     | 42.20%                                    | 41.12% | 37.96% | 38.53% | 36.89% | 34.58% | 38.55%    | 43.59%                                          | 40.68% | 42.13%    |
| 45 – 54   |                                     | 41.58%                                    | 34.00% | 40.82% | 35.35% | 34.02% | 31.25% | 36.17%    | 28.04%                                          | 27.62% | 27.83%    |
| 55 – 64   |                                     | 27.87%                                    | 24.59% | 30.51% | 33.90% | 37.50% | 28.07% | 30.41%    | 33.85%                                          | 28.36% | 31.10%    |
| ≥ 65      |                                     | 25.93%                                    | 23.08% | 32.00% | 30.77% | 28.00% | 28.00% | 27.96%    | 35.71%                                          | 28.57% | 32.14%    |
| $\bar{X}$ |                                     | 30.96%                                    | 36.19% | 31.59% | 35.84% | 29.71% | 34.48% | -         | 34.74%                                          | 32.19% | -         |
| ≤ 18      | Totally agree                       | 0.00%                                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%     | 0.00%                                           | 0.00%  | 0.00%     |
| 19 – 24   |                                     | 5.56%                                     | 5.56%  | 11.11% | 11.11% | 16.67% | 5.56%  | 9.26%     | 11.11%                                          | 11.76% | 11.44%    |
| 25 – 34   |                                     | 12.24%                                    | 12.50% | 14.58% | 19.15% | 14.58% | 14.58% | 14.61%    | 20.00%                                          | 18.37% | 19.18%    |
| 35 – 44   |                                     | 10.09%                                    | 11.21% | 11.11% | 10.09% | 10.68% | 11.21% | 10.73%    | 27.35%                                          | 27.12% | 27.23%    |
| 45 – 54   |                                     | 12.87%                                    | 17.00% | 15.31% | 17.17% | 15.46% | 13.54% | 15.23%    | 33.64%                                          | 36.19% | 34.92%    |
| 55 – 64   |                                     | 14.75%                                    | 16.39% | 15.25% | 15.25% | 12.50% | 14.04% | 14.70%    | 27.69%                                          | 29.85% | 28.77%    |
| ≥ 65      |                                     | 18.52%                                    | 15.38% | 12.00% | 15.38% | 12.00% | 16.00% | 14.88%    | 21.43%                                          | 25.00% | 23.21%    |
| $\bar{X}$ |                                     | 10.58%                                    | 11.15% | 11.34% | 12.59% | 11.70% | 10.70% | -         | 20.18%                                          | 21.18% | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

Table 41. (continued)

| Age group | 5-point Likert scale<br>(Agreement) | Attitude Toward Using (ATU) <sup>a)</sup> |       |        |       |        |        |           | 5-point Likert scale<br>(Frequency) | Actual System in Use (ASU) <sup>b)</sup> |        |           |
|-----------|-------------------------------------|-------------------------------------------|-------|--------|-------|--------|--------|-----------|-------------------------------------|------------------------------------------|--------|-----------|
|           |                                     | ATU_1                                     | ATU_2 | ATU_3  | ATU_4 | ATU_5  | ATU_6  | $\bar{X}$ |                                     | ASU_1                                    | ASU_2  | $\bar{X}$ |
| ≤ 18      | Totally disagree                    | 0.00%                                     | 0.00% | 0.00%  | 0.00% | 0.00%  | 0.00%  | 0.00%     | Never                               | 66.67%                                   | 66.67% | 66.67%    |
| 19 – 24   |                                     | 5.26%                                     | 5.26% | 5.26%  | 5.26% | 5.26%  | 5.56%  | 5.31%     |                                     | 26.32%                                   | 42.11% | 34.21%    |
| 25 – 34   |                                     | 2.04%                                     | 2.00% | 3.92%  | 3.92% | 4.00%  | 3.92%  | 3.30%     |                                     | 25.00%                                   | 19.23% | 22.12%    |
| 35 – 44   |                                     | 4.27%                                     | 2.46% | 1.61%  | 3.28% | 3.33%  | 5.83%  | 3.47%     |                                     | 27.78%                                   | 26.19% | 26.98%    |
| 45 – 54   |                                     | 5.83%                                     | 5.77% | 3.74%  | 8.49% | 7.07%  | 8.16%  | 6.51%     |                                     | 26.13%                                   | 27.93% | 27.03%    |
| 55 – 64   |                                     | 6.06%                                     | 8.82% | 4.41%  | 8.82% | 12.50% | 10.29% | 8.49%     |                                     | 29.58%                                   | 30.99% | 30.28%    |
| ≥ 65      |                                     | 0.00%                                     | 0.00% | 0.00%  | 0.00% | 0.00%  | 0.00%  | 0.00%     |                                     | 39.39%                                   | 42.42% | 40.91%    |
| $\bar{X}$ |                                     | 3.35%                                     | 3.47% | 2.71%  | 4.25% | 4.60%  | 4.82%  | -         |                                     | 34.41%                                   | 36.50% | -         |
| ≤ 18      | Disagree                            | 0.00%                                     | 0.00% | 0.00%  | 0.00% | 0.00%  | 0.00%  | 0.00%     | Rarely                              | 0.00%                                    | 0.00%  | 0.00%     |
| 19 – 24   |                                     | 15.79%                                    | 5.26% | 10.53% | 5.26% | 10.53% | 5.56%  | 8.82%     |                                     | 36.84%                                   | 31.58% | 34.21%    |

| Age group | 5-point Likert scale<br>(Agreement) | Attitude Toward Using (ATU) <sup>a)</sup> |        |        |        |        |        |           | 5-point Likert scale<br>(Frequency) | Actual System in Use (ASU) <sup>b)</sup> |        |           |
|-----------|-------------------------------------|-------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------------------------------|------------------------------------------|--------|-----------|
|           |                                     | ATU_1                                     | ATU_2  | ATU_3  | ATU_4  | ATU_5  | ATU_6  | $\bar{X}$ |                                     | ASU_1                                    | ASU_2  | $\bar{X}$ |
| 25 – 34   |                                     | 6.12%                                     | 8.00%  | 1.96%  | 5.88%  | 4.00%  | 3.92%  | 4.98%     |                                     | 42.31%                                   | 46.15% | 44.23%    |
| 35 – 44   |                                     | 5.98%                                     | 8.20%  | 5.65%  | 5.74%  | 6.67%  | 7.50%  | 6.62%     |                                     | 41.27%                                   | 44.44% | 42.86%    |
| 45 – 54   |                                     | 5.83%                                     | 6.73%  | 2.80%  | 9.43%  | 9.09%  | 12.24% | 7.69%     |                                     | 36.04%                                   | 36.94% | 36.49%    |
| 55 – 64   |                                     | 9.09%                                     | 5.88%  | 2.94%  | 4.41%  | 3.13%  | 7.35%  | 5.47%     |                                     | 42.25%                                   | 40.85% | 41.55%    |
| ≥ 65      |                                     | 3.57%                                     | 13.79% | 6.67%  | 13.79% | 7.14%  | 10.34% | 9.22%     |                                     | 33.33%                                   | 36.36% | 34.85%    |
| $\bar{X}$ |                                     | 6.63%                                     | 6.84%  | 4.36%  | 6.36%  | 5.79%  | 6.70%  | -         |                                     | 33.15%                                   | 33.76% | -         |
| ≤ 18      | Neither disagree or agree           | 50.00%                                    | 50.00% | 50.00% | 66.67% | 50.00% | 66.67% | 55.56%    | Occasionally                        | 0.00%                                    | 0.00%  | 0.00%     |
| 19 – 24   |                                     | 15.79%                                    | 21.05% | 21.05% | 15.79% | 15.79% | 16.67% | 17.69%    |                                     | 10.53%                                   | 15.79% | 13.16%    |
| 25 – 34   |                                     | 22.45%                                    | 10.00% | 7.84%  | 7.84%  | 14.00% | 13.73% | 12.64%    |                                     | 25.00%                                   | 25.00% | 25.00%    |
| 35 – 44   |                                     | 20.51%                                    | 10.66% | 8.06%  | 14.75% | 10.83% | 18.33% | 13.86%    |                                     | 24.60%                                   | 23.02% | 23.81%    |
| 45 – 54   |                                     | 13.59%                                    | 12.50% | 11.21% | 11.32% | 14.14% | 15.31% | 13.01%    |                                     | 28.83%                                   | 26.13% | 27.48%    |
| 55 – 64   |                                     | 13.64%                                    | 7.35%  | 11.76% | 10.29% | 12.50% | 19.12% | 12.44%    |                                     | 16.90%                                   | 21.13% | 19.01%    |
| ≥ 65      |                                     | 28.57%                                    | 13.79% | 10.00% | 10.34% | 25.00% | 20.69% | 18.07%    |                                     | 18.18%                                   | 18.18% | 18.18%    |
| $\bar{X}$ |                                     | 23.51%                                    | 17.91% | 17.13% | 19.57% | 20.32% | 24.36% | -         |                                     | 17.72%                                   | 18.46% | -         |
| ≤ 18      | Agree                               | 50.00%                                    | 50.00% | 50.00% | 33.33% | 50.00% | 33.33% | 44.44%    | Frequently                          | 33.33%                                   | 33.33% | 33.33%    |
| 19 – 24   |                                     | 57.89%                                    | 47.37% | 52.63% | 63.16% | 63.16% | 66.67% | 58.48%    |                                     | 10.53%                                   | 0.00%  | 5.26%     |
| 25 – 34   |                                     | 48.98%                                    | 54.00% | 52.94% | 50.98% | 52.00% | 50.98% | 51.65%    |                                     | 3.85%                                    | 5.77%  | 4.81%     |
| 35 – 44   |                                     | 45.30%                                    | 44.26% | 44.35% | 40.98% | 42.50% | 41.67% | 43.18%    |                                     | 3.97%                                    | 3.97%  | 3.97%     |
| 45 – 54   |                                     | 46.60%                                    | 36.54% | 42.06% | 34.91% | 31.31% | 31.63% | 37.17%    |                                     | 7.21%                                    | 7.21%  | 7.21%     |
| 55 – 64   |                                     | 50.00%                                    | 44.12% | 42.65% | 42.65% | 43.75% | 42.65% | 44.30%    |                                     | 11.27%                                   | 7.04%  | 9.15%     |
| ≥ 65      |                                     | 46.43%                                    | 44.83% | 53.33% | 44.83% | 50.00% | 48.28% | 47.95%    |                                     | 9.09%                                    | 3.03%  | 6.06%     |
| $\bar{X}$ |                                     | 49.31%                                    | 45.87% | 48.28% | 44.41% | 47.53% | 45.03% | -         |                                     | 11.32%                                   | 8.62%  | -         |
| ≤ 18      | Totally agree                       | 0.00%                                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%     | Very frequently                     | 0.00%                                    | 0.00%  | 0.00%     |
| 19 – 24   |                                     | 5.26%                                     | 21.05% | 10.53% | 10.53% | 5.26%  | 5.56%  | 9.70%     |                                     | 15.79%                                   | 10.53% | 13.16%    |
| 25 – 34   |                                     | 20.41%                                    | 26.00% | 33.33% | 31.37% | 26.00% | 27.45% | 27.43%    |                                     | 3.85%                                    | 3.85%  | 3.85%     |
| 35 – 44   |                                     | 23.93%                                    | 34.43% | 40.32% | 35.25% | 36.67% | 26.67% | 32.88%    |                                     | 2.38%                                    | 2.38%  | 2.38%     |
| 45 – 54   |                                     | 28.16%                                    | 38.46% | 40.19% | 35.85% | 38.38% | 32.65% | 35.61%    |                                     | 1.80%                                    | 1.80%  | 1.80%     |
| 55 – 64   |                                     | 21.21%                                    | 33.82% | 38.24% | 33.82% | 28.13% | 20.59% | 29.30%    |                                     | 0.00%                                    | 0.00%  | 0.00%     |
| ≥ 65      |                                     | 21.43%                                    | 27.59% | 30.00% | 31.03% | 17.86% | 20.69% | 24.77%    |                                     | 0.00%                                    | 0.00%  | 0.00%     |
| $\bar{X}$ |                                     | 17.20%                                    | 25.91% | 27.51% | 25.41% | 21.76% | 19.09% | -         |                                     | 3.40%                                    | 2.65%  | -         |

a) 5-Likert agreement scale

b) 5-Likert frequency scale

## Annex X – Healthcare stakeholders’ perspectives on barriers preventing electronic access to health data: agreement analysis (%)

Table 42. Healthcare stakeholders’ perspectives on barriers preventing electronic access to health data: agreement analysis (%)

| 5-point Likert scale      | Healthcare stakeholder | PBDA_1 | PBDA_2 | PBDA_3 | PBDA_4 | PBDA_5 | PBDA_6 | PBDA_7 | PBDA_8 | PBDA_9 | $\bar{X}$ |
|---------------------------|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| Totally disagree          | Hpro                   | 1.48%  | 5.54%  | 4.43%  | 2.21%  | 2.21%  | 1.11%  | 7.38%  | 2.95%  | 5.54%  | 3.65%     |
|                           | Pati                   | 4.34%  | 6.75%  | 5.78%  | 3.61%  | 4.34%  | 4.34%  | 6.51%  | 3.13%  | 4.34%  | 4.79%     |
|                           | Admi                   | 0.00%  | 0.00%  | 5.56%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 5.56%  | 5.56%  | 1.85%     |
|                           | Mana                   | 0.00%  | 9.09%  | 9.09%  | 9.09%  | 4.55%  | 4.55%  | 0.00%  | 9.09%  | 9.09%  | 6.06%     |
|                           | Pmkr                   | 0.00%  | 9.09%  | 27.27% | 18.18% | 27.27% | 9.09%  | 27.27% | 9.09%  | 18.18% | 16.16%    |
|                           | $\bar{X}$              | 1.16%  | 6.09%  | 10.43% | 6.62%  | 7.67%  | 3.82%  | 8.23%  | 5.96%  | 8.54%  | -         |
| Disagree                  | Hpro                   | 12.18% | 20.30% | 21.03% | 14.39% | 18.45% | 11.44% | 26.20% | 15.50% | 17.71% | 17.47%    |
|                           | Pati                   | 13.73% | 17.59% | 15.42% | 15.66% | 15.66% | 14.22% | 18.55% | 14.46% | 17.59% | 15.88%    |
|                           | Admi                   | 11.11% | 27.78% | 22.22% | 5.56%  | 11.11% | 11.11% | 33.33% | 16.67% | 33.33% | 19.14%    |
|                           | Mana                   | 27.27% | 9.09%  | 40.91% | 18.18% | 13.64% | 13.64% | 31.82% | 13.64% | 18.18% | 20.71%    |
|                           | Pmkr                   | 0.00%  | 36.36% | 9.09%  | 9.09%  | 18.18% | 9.09%  | 36.36% | 18.18% | 0.00%  | 15.15%    |
|                           | $\bar{X}$              | 12.86% | 22.22% | 21.74% | 12.58% | 15.41% | 11.90% | 29.25% | 15.69% | 17.36% | -         |
| Neither disagree or agree | Hpro                   | 14.39% | 11.07% | 16.97% | 11.07% | 10.70% | 11.44% | 11.81% | 15.13% | 19.56% | 13.57%    |
|                           | Pati                   | 39.52% | 26.51% | 31.57% | 27.47% | 24.58% | 29.40% | 29.40% | 29.40% | 33.49% | 30.15%    |
|                           | Admi                   | 11.11% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 5.56%  | 0.00%  | 5.56%  | 5.56%  | 3.09%     |
|                           | Mana                   | 13.64% | 4.55%  | 4.55%  | 4.55%  | 4.55%  | 0.00%  | 4.55%  | 9.09%  | 9.09%  | 6.06%     |
|                           | Pmkr                   | 18.18% | 18.18% | 9.09%  | 9.09%  | 9.09%  | 9.09%  | 9.09%  | 9.09%  | 9.09%  | 11.11%    |
|                           | $\bar{X}$              | 19.37% | 12.06% | 12.44% | 10.44% | 9.78%  | 11.10% | 10.97% | 13.65% | 15.36% | -         |
| Agree                     | Hpro                   | 45.02% | 48.71% | 51.29% | 44.28% | 53.14% | 42.44% | 45.76% | 50.55% | 43.54% | 47.19%    |
|                           | Pati                   | 33.73% | 40.48% | 38.80% | 36.87% | 40.96% | 35.90% | 36.14% | 34.22% | 30.12% | 36.36%    |
|                           | Admi                   | 66.67% | 61.11% | 61.11% | 88.89% | 66.67% | 44.44% | 61.11% | 66.67% | 50.00% | 62.96%    |
|                           | Mana                   | 40.91% | 63.64% | 36.36% | 45.45% | 50.00% | 31.82% | 40.91% | 50.00% | 54.55% | 45.96%    |
|                           | Pmkr                   | 63.64% | 18.18% | 27.27% | 18.18% | 18.18% | 54.55% | 27.27% | 36.36% | 63.64% | 36.36%    |
|                           | $\bar{X}$              | 49.99% | 46.42% | 42.97% | 46.73% | 45.79% | 41.83% | 42.24% | 47.56% | 48.37% | -         |
| Totally agree             | Hpro                   | 26.94% | 14.39% | 6.27%  | 28.04% | 15.50% | 33.58% | 8.86%  | 15.87% | 13.65% | 18.12%    |
|                           | Pati                   | 8.67%  | 8.67%  | 8.43%  | 16.39% | 14.46% | 16.14% | 9.40%  | 18.80% | 14.46% | 12.82%    |
|                           | Admi                   | 11.11% | 11.11% | 11.11% | 5.56%  | 22.22% | 38.89% | 5.56%  | 5.56%  | 5.56%  | 12.96%    |
|                           | Mana                   | 18.18% | 13.64% | 9.09%  | 22.73% | 27.27% | 50.00% | 22.73% | 18.18% | 9.09%  | 21.21%    |
|                           | Pmkr                   | 18.18% | 18.18% | 27.27% | 45.45% | 27.27% | 18.18% | 0.00%  | 27.27% | 9.09%  | 21.21%    |
|                           | $\bar{X}$              | 16.62% | 13.20% | 12.44% | 23.63% | 21.34% | 31.36% | 9.31%  | 17.13% | 10.37% | -         |

## Annex XI – Healthcare professionals’ perspectives about barriers preventing electronic access to health data: standard deviation

Table 43. Healthcare professionals’ perspectives about barriers preventing electronic access to health data: standard deviation

| Barriers preventing electronic access to health data <sup>a)</sup> | Standard deviation |      |      |      |      |      |      | $\bar{X}$ |
|--------------------------------------------------------------------|--------------------|------|------|------|------|------|------|-----------|
|                                                                    | Phar               | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr |           |
| PBDA_1                                                             | 1.07               | 1.01 | 0.96 | 0.88 | 1.08 | 0.96 | 0.67 | 0.95      |
| PBDA_2                                                             | 1.18               | 1.22 | 1.02 | 1.19 | 1.14 | 1.13 | 1.45 | 1.19      |
| PBDA_3                                                             | 0.92               | 1.12 | 0.91 | 1.18 | 0.94 | 1.07 | 1.37 | 1.07      |
| PBDA_4                                                             | 1.07               | 0.96 | 1.00 | 1.14 | 1.09 | 1.06 | 1.57 | 1.13      |
| PBDA_5                                                             | 1.07               | 1.14 | 0.94 | 0.95 | 1.07 | 0.77 | 1.48 | 1.06      |
| PBDA_6                                                             | 1.06               | 0.86 | 0.96 | 1.01 | 0.98 | 1.08 | 1.35 | 1.04      |
| PBDA_7                                                             | 0.94               | 1.23 | 1.12 | 1.22 | 0.95 | 1.08 | 1.63 | 1.17      |
| PBDA_8                                                             | 1.13               | 0.99 | 1.03 | 0.99 | 0.74 | 0.98 | 1.26 | 1.02      |
| PBDA_9                                                             | 1.26               | 1.03 | 1.07 | 1.22 | 1.07 | 1.06 | 1.06 | 1.11      |
| $\bar{X}$                                                          | 1.08               | 1.06 | 1.00 | 1.09 | 1.01 | 1.02 | 1.32 | -         |

a) 5-Likert agreement scale: 1 – Totally disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Totally agree

## Annex XII – Healthcare professionals’ perspectives on barriers preventing electronic access to health data: agreement analysis (%)

Table 44. Healthcare professionals’ perspectives on barriers preventing electronic access to health data: agreement analysis (%)

| 5-point Likert scale      | Healthcare professional | PBDA_1 | PBDA_2 | PBDA_3 | PBDA_4 | PBDA_5 | PBDA_6 | PBDA_7 | PBDA_8 | PBDA_9 | $\bar{X}$ |
|---------------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| Totally disagree          | Phar                    | 7.89%  | 5.26%  | 5.26%  | 5.26%  | 2.63%  | 2.63%  | 5.26%  | 2.63%  | 10.53% | 5.26%     |
|                           | Phys                    | 0.00%  | 6.90%  | 6.90%  | 0.00%  | 3.45%  | 0.00%  | 6.90%  | 1.72%  | 1.72%  | 3.07%     |
|                           | Nurs                    | 0.94%  | 4.72%  | 0.94%  | 0.94%  | 0.94%  | 0.94%  | 7.55%  | 3.77%  | 3.77%  | 2.73%     |
|                           | Sdtt                    | 0.00%  | 6.25%  | 9.38%  | 3.13%  | 0.00%  | 0.00%  | 9.38%  | 3.13%  | 12.50% | 4.86%     |
|                           | Psyc                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%     |
|                           | Sht                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 6.67%  | 0.74%     |
|                           | Nutr                    | 0.00%  | 20.00% | 20.00% | 20.00% | 20.00% | 10.00% | 30.00% | 10.00% | 10.00% | 15.56%    |
|                           | $\bar{X}$               | 1.26%  | 6.16%  | 6.07%  | 4.19%  | 3.86%  | 1.94%  | 8.44%  | 3.04%  | 6.46%  | -         |
| Disagree                  | Phar                    | 2.63%  | 18.42% | 5.26%  | 10.53% | 13.16% | 7.89%  | 5.26%  | 13.16% | 13.16% | 9.94%     |
|                           | Phys                    | 12.07% | 25.86% | 22.41% | 10.34% | 25.86% | 6.90%  | 32.76% | 17.24% | 20.69% | 19.35%    |
|                           | Nurs                    | 11.32% | 15.09% | 22.64% | 13.21% | 16.04% | 9.43%  | 24.53% | 17.92% | 20.75% | 16.77%    |
|                           | Sdtt                    | 12.50% | 21.88% | 18.75% | 18.75% | 18.75% | 15.63% | 37.50% | 12.50% | 15.63% | 19.10%    |
|                           | Psyc                    | 25.00% | 25.00% | 33.33% | 25.00% | 33.33% | 16.67% | 41.67% | 8.33%  | 16.67% | 25.00%    |
|                           | Sht                     | 40.00% | 26.67% | 46.67% | 40.00% | 13.33% | 40.00% | 40.00% | 13.33% | 6.67%  | 29.63%    |
|                           | Nutr                    | 0.00%  | 30.00% | 10.00% | 0.00%  | 10.00% | 10.00% | 10.00% | 10.00% | 10.00% | 10.00%    |
|                           | $\bar{X}$               | 14.79% | 23.27% | 22.72% | 16.83% | 18.64% | 15.22% | 27.39% | 13.21% | 14.79% | -         |
| Neither disagree or agree | Phar                    | 13.16% | 18.42% | 28.95% | 15.79% | 21.05% | 18.42% | 21.05% | 23.68% | 26.32% | 20.76%    |
|                           | Phys                    | 6.90%  | 8.62%  | 15.52% | 8.62%  | 6.90%  | 6.90%  | 8.62%  | 15.52% | 18.97% | 10.73%    |
|                           | Nurs                    | 15.09% | 13.21% | 16.98% | 12.26% | 12.26% | 11.32% | 13.21% | 14.15% | 16.98% | 13.94%    |
|                           | Sdtt                    | 15.63% | 6.25%  | 6.25%  | 3.13%  | 3.13%  | 9.38%  | 3.13%  | 9.38%  | 12.50% | 7.64%     |
|                           | Psyc                    | 25.00% | 0.00%  | 16.67% | 16.67% | 8.33%  | 16.67% | 16.67% | 0.00%  | 25.00% | 13.89%    |
|                           | Sht                     | 33.33% | 13.33% | 13.33% | 13.33% | 0.00%  | 6.67%  | 6.67%  | 26.67% | 33.33% | 16.30%    |
|                           | Nutr                    | 10.00% | 0.00%  | 20.00% | 10.00% | 20.00% | 20.00% | 10.00% | 10.00% | 20.00% | 13.33%    |
|                           | $\bar{X}$               | 17.02% | 8.55%  | 16.81% | 11.40% | 10.24% | 12.76% | 11.33% | 14.20% | 21.87% | -         |
| Agree                     | Phar                    | 55.26% | 36.84% | 52.63% | 50.00% | 39.47% | 34.21% | 57.89% | 28.95% | 28.95% | 42.69%    |
|                           | Phys                    | 34.48% | 43.10% | 46.55% | 37.93% | 48.28% | 41.38% | 37.93% | 51.72% | 44.83% | 42.91%    |
|                           | Nurs                    | 48.11% | 57.55% | 55.66% | 46.23% | 56.60% | 44.34% | 48.11% | 53.77% | 46.23% | 50.73%    |
|                           | Sdtt                    | 56.25% | 50.00% | 56.25% | 50.00% | 62.50% | 46.88% | 43.75% | 59.38% | 50.00% | 52.78%    |
|                           | Psyc                    | 33.33% | 50.00% | 50.00% | 41.67% | 50.00% | 50.00% | 41.67% | 75.00% | 33.33% | 47.22%    |
|                           | Sht                     | 20.00% | 40.00% | 33.33% | 40.00% | 80.00% | 46.67% | 46.67% | 40.00% | 40.00% | 42.96%    |
|                           | Nutr                    | 50.00% | 40.00% | 40.00% | 30.00% | 30.00% | 30.00% | 30.00% | 50.00% | 60.00% | 40.00%    |
|                           | $\bar{X}$               | 42.49% | 45.36% | 47.78% | 42.26% | 52.41% | 41.92% | 43.72% | 51.26% | 43.33% | -         |
| Totally agree             | Phar                    | 21.05% | 21.05% | 7.89%  | 18.42% | 23.68% | 36.84% | 10.53% | 31.58% | 21.05% | 21.35%    |
|                           | Phys                    | 46.55% | 15.52% | 8.62%  | 43.10% | 15.52% | 44.83% | 13.79% | 13.79% | 13.79% | 23.95%    |
|                           | Nurs                    | 24.53% | 9.43%  | 3.77%  | 27.36% | 14.15% | 33.96% | 6.60%  | 10.38% | 12.26% | 15.83%    |

| 5-point Likert scale | Healthcare professional | PBDA_1 | PBDA_2 | PBDA_3 | PBDA_4 | PBDA_5 | PBDA_6 | PBDA_7 | PBDA_8 | PBDA_9 | $\bar{X}$ |
|----------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
|                      | Sdt                     | 15.63% | 15.63% | 9.38%  | 25.00% | 15.63% | 28.13% | 6.25%  | 15.63% | 9.38%  | 15.63%    |
|                      | Psyc                    | 16.67% | 25.00% | 0.00%  | 16.67% | 8.33%  | 16.67% | 0.00%  | 16.67% | 25.00% | 13.89%    |
|                      | Sht                     | 6.67%  | 20.00% | 6.67%  | 6.67%  | 6.67%  | 6.67%  | 6.67%  | 20.00% | 13.33% | 10.37%    |
|                      | Nutr                    | 40.00% | 10.00% | 10.00% | 40.00% | 20.00% | 30.00% | 20.00% | 20.00% | 0.00%  | 21.11%    |
|                      | $\bar{X}$               | 24.44% | 16.66% | 6.62%  | 25.32% | 14.85% | 28.16% | 9.12%  | 18.29% | 13.55% | -         |

### Annex XIII – Patients’ perspectives by age group about barriers preventing electronic access to health data: standard deviation

Table 45. Patients’ perspectives by age group about barriers preventing electronic access to health data: standard deviation

| Barriers preventing electronic access to health data <sup>a)</sup> | Standard deviation |         |         |         |         |         |           | $\bar{X}$ |
|--------------------------------------------------------------------|--------------------|---------|---------|---------|---------|---------|-----------|-----------|
|                                                                    | $\leq 18$          | 19 – 24 | 25 – 34 | 35 – 44 | 45 – 54 | 55 – 64 | $\geq 65$ |           |
| PBDA_1                                                             | 0.58               | 0.98    | 0.97    | 0.96    | 1.02    | 0.93    | 0.75      | 0.89      |
| PBDA_2                                                             | 0.58               | 1.03    | 1.07    | 1.05    | 1.06    | 1.18    | 0.90      | 0.98      |
| PBDA_3                                                             | 0.58               | 0.99    | 1.04    | 1.02    | 0.99    | 1.09    | 0.93      | 0.95      |
| PBDA_4                                                             | 0.58               | 1.07    | 1.04    | 1.05    | 1.15    | 1.00    | 0.92      | 0.97      |
| PBDA_5                                                             | 0.58               | 0.99    | 1.11    | 1.06    | 1.09    | 1.08    | 0.87      | 0.97      |
| PBDA_6                                                             | 0.58               | 1.15    | 0.97    | 1.02    | 1.19    | 1.01    | 0.97      | 0.98      |
| PBDA_7                                                             | 0.58               | 1.10    | 1.08    | 1.02    | 1.12    | 1.14    | 0.84      | 0.98      |
| PBDA_8                                                             | 0.58               | 0.89    | 0.98    | 0.99    | 1.17    | 1.08    | 0.94      | 0.94      |
| PBDA_9                                                             | 0.58               | 0.89    | 0.98    | 1.02    | 1.16    | 1.10    | 0.98      | 0.96      |
| $\bar{X}$                                                          | 0.58               | 1.01    | 1.03    | 1.02    | 1.11    | 1.07    | 0.90      | -         |

a) 5-Likert agreement scale: 1 – Totally disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Totally agree



| 5-point Likert scale | Age group | PBDA_1 | PBDA_2 | PBDA_3 | PBDA_4 | PBDA_5 | PBDA_6 | PBDA_7 | PBDA_8 | PBDA_9 | $\bar{X}$ |
|----------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
|                      | 19 – 24   | 0.00%  | 0.00%  | 0.00%  | 15.79% | 0.00%  | 10.53% | 5.26%  | 0.00%  | 0.00%  | 3.51%     |
|                      | 25 – 34   | 11.54% | 5.77%  | 5.77%  | 15.38% | 13.46% | 11.54% | 13.46% | 17.31% | 17.31% | 12.39%    |
|                      | 35 – 44   | 8.73%  | 7.14%  | 5.56%  | 14.29% | 15.08% | 15.87% | 10.32% | 23.02% | 15.08% | 12.79%    |
|                      | 45 – 54   | 11.71% | 11.71% | 12.61% | 22.52% | 17.12% | 22.52% | 9.91%  | 17.12% | 14.41% | 15.52%    |
|                      | 55 – 64   | 5.63%  | 11.27% | 9.86%  | 14.08% | 15.49% | 12.68% | 7.04%  | 21.13% | 15.49% | 12.52%    |
|                      | ≥ 65      | 6.06%  | 9.09%  | 12.12% | 12.12% | 12.12% | 15.15% | 6.06%  | 18.18% | 15.15% | 11.78%    |
|                      | $\bar{X}$ | 6.24%  | 6.43%  | 6.56%  | 13.46% | 10.47% | 12.61% | 7.44%  | 13.82% | 11.06% | -         |

## Annex XV – Healthcare stakeholders’ perspectives about healthcare data utility: standard deviation

Table 47. Healthcare stakeholders’ perspectives about healthcare data utility: standard deviation

| Primary information category | Secondary information category                      | Standard deviation |      |      |      |      |           |
|------------------------------|-----------------------------------------------------|--------------------|------|------|------|------|-----------|
|                              |                                                     | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ |
| PUD_1 <sup>a)</sup>          | Allergies and intolerances                          | 1.04               | 1.15 | 1.02 | 0.90 | 0.69 | 0.96      |
|                              | Demography                                          | 1.07               | 1.18 | 1.14 | 1.05 | 0.94 | 1.08      |
|                              | Pregnancy                                           | 0.91               | 1.21 | 1.08 | 1.05 | 0.69 | 0.99      |
|                              | Habits                                              | 0.94               | 1.11 | 1.08 | 0.73 | 1.01 | 0.97      |
|                              | Clinical and family history                         | 0.92               | 1.11 | 1.35 | 0.51 | 0.69 | 0.92      |
|                              | Identification                                      | 0.76               | 1.08 | 0.79 | 0.79 | 0.83 | 0.85      |
|                              | Death                                               | 1.03               | 1.18 | 1.15 | 0.85 | 1.17 | 1.08      |
|                              | Pathologies                                         | 0.77               | 1.12 | 1.23 | 0.80 | 0.69 | 0.92      |
|                              | $\bar{X}$                                           | 0.93               | 1.14 | 1.10 | 0.83 | 0.84 | -         |
| PUD_2 <sup>a)</sup>          | Anthropometric evaluation                           | 1.02               | 1.16 | 1.10 | 0.89 | 0.60 | 0.95      |
|                              | Laboratory tests                                    | 0.81               | 1.11 | 1.06 | 0.95 | 0.67 | 0.92      |
|                              | Imaging exams                                       | 1.00               | 1.14 | 1.18 | 1.04 | 0.67 | 1.01      |
|                              | Rapid tests                                         | 0.94               | 1.14 | 1.11 | 0.81 | 1.00 | 1.00      |
|                              | Physical exams                                      | 0.96               | 1.18 | 1.11 | 0.89 | 0.94 | 1.02      |
|                              | Electrocardiogram                                   | 1.05               | 1.17 | 1.21 | 0.89 | 0.67 | 1.00      |
|                              | Vital parameters                                    | 0.88               | 1.17 | 1.08 | 0.84 | 0.67 | 0.93      |
|                              | $\bar{X}$                                           | 0.95               | 1.15 | 1.12 | 0.90 | 0.75 | -         |
| PUD_3 <sup>a)</sup>          | Vaccination and immunization                        | 0.93               | 1.12 | 1.06 | 0.96 | 0.98 | 1.01      |
|                              | Screenings                                          | 0.98               | 1.11 | 1.11 | 0.83 | 1.00 | 1.00      |
|                              | Diet                                                | 1.02               | 1.11 | 1.13 | 0.76 | 1.04 | 1.01      |
|                              | Physical activity                                   | 1.05               | 1.14 | 1.17 | 0.87 | 1.04 | 1.06      |
|                              | Antimicrobial resistance                            | 1.09               | 1.15 | 1.41 | 0.91 | 0.69 | 1.05      |
|                              | Smoking                                             | 0.96               | 1.19 | 1.18 | 1.10 | 0.79 | 1.04      |
|                              | Epidemiology                                        | 1.02               | 1.13 | 1.16 | 0.87 | 0.79 | 0.99      |
|                              | $\bar{X}$                                           | 1.01               | 1.14 | 1.17 | 0.90 | 0.90 | -         |
| PUD_4 <sup>a)</sup>          | Medicines                                           | 0.73               | 1.06 | 1.16 | 0.96 | 0.67 | 0.92      |
|                              | Pharmaceutical products                             | 0.89               | 1.12 | 1.16 | 0.83 | 0.67 | 0.93      |
|                              | Medical consumables                                 | 0.96               | 1.19 | 1.10 | 0.69 | 0.83 | 0.95      |
|                              | Laboratory consumables                              | 1.03               | 1.19 | 1.23 | 0.71 | 0.83 | 1.00      |
|                              | Drug interactions                                   | 0.94               | 1.16 | 1.29 | 0.85 | 0.67 | 0.98      |
|                              | Dosage                                              | 0.90               | 1.17 | 1.33 | 0.79 | 0.94 | 1.03      |
|                              | Technical information about healthcare technologies | 0.96               | 1.17 | 1.19 | 0.85 | 0.67 | 0.97      |

| Primary information category | Secondary information category                           | Standard deviation |      |      |      |      |           |
|------------------------------|----------------------------------------------------------|--------------------|------|------|------|------|-----------|
|                              |                                                          | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ |
|                              | $\bar{X}$                                                | 0.91               | 1.15 | 1.21 | 0.81 | 0.76 | -         |
| PUD_5 <sup>a)</sup>          | Access to emergency services                             | 1.06               | 1.21 | 0.69 | 0.88 | 0.79 | 0.92      |
|                              | Access to appointments                                   | 0.88               | 1.18 | 0.83 | 0.98 | 0.67 | 0.91      |
|                              | Access to treatments                                     | 0.87               | 1.17 | 0.88 | 0.85 | 0.67 | 0.89      |
|                              | Access to surgeries                                      | 1.10               | 1.23 | 1.24 | 0.95 | 0.67 | 1.04      |
|                              | $\bar{X}$                                                | 0.98               | 1.20 | 0.91 | 0.92 | 0.70 | -         |
| PUD_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 1.26               | 1.23 | 1.06 | 1.24 | 0.81 | 1.12      |
|                              | Cost with medicines                                      | 1.24               | 1.25 | 0.96 | 1.14 | 0.79 | 1.08      |
|                              | Cost with pharmaceutical products                        | 1.26               | 1.23 | 1.04 | 1.20 | 1.04 | 1.15      |
|                              | Cost with medical consumables                            | 1.26               | 1.24 | 1.20 | 1.21 | 0.89 | 1.16      |
|                              | Cost with laboratory consumables                         | 1.27               | 1.26 | 1.20 | 1.23 | 0.89 | 1.17      |
|                              | Cost with human resources                                | 1.28               | 1.24 | 1.14 | 1.27 | 0.98 | 1.18      |
|                              | $\bar{X}$                                                | 1.26               | 1.24 | 1.10 | 1.22 | 0.90 | -         |
| PUD_7 <sup>a)</sup>          | Average time of appointment                              | 1.15               | 1.24 | 1.10 | 1.11 | 1.19 | 1.16      |
|                              | Average time of treatment                                | 1.10               | 1.22 | 1.17 | 1.05 | 1.17 | 1.14      |
|                              | Average time of waiting                                  | 1.12               | 1.32 | 1.08 | 1.00 | 1.17 | 1.14      |
|                              | Average time of management and administration            | 1.14               | 1.28 | 1.17 | 1.07 | 1.33 | 1.20      |
|                              | $\bar{X}$                                                | 1.13               | 1.27 | 1.13 | 1.05 | 1.21 | -         |

a) 5-Likert utility scale: 1 – Not useful at all; 2 – Not very useful; 3 – Moderately useful; 4 – Useful; 5 – Very useful

## Annex XVI – Healthcare stakeholders’ perspectives about healthcare data: utility analysis (%)

Table 48. Healthcare stakeholders’ perspectives about healthcare data: utility analysis (%)

| Primary information category | Secondary information category                      | Not useful at all |       |        |       |       |           | Not very useful |        |        |       |        |           |
|------------------------------|-----------------------------------------------------|-------------------|-------|--------|-------|-------|-----------|-----------------|--------|--------|-------|--------|-----------|
|                              |                                                     | Hpro              | Pati  | Admi   | Mana  | Pmkr  | $\bar{X}$ | Hpro            | Pati   | Admi   | Mana  | Pmkr   | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances                          | 2.95%             | 5.78% | 5.56%  | 0.00% | 0.00% | 2.86%     | 5.17%           | 6.99%  | 0.00%  | 4.55% | 0.00%  | 3.34%     |
|                              | Demography                                          | 4.06%             | 7.47% | 5.56%  | 4.55% | 0.00% | 4.33%     | 10.33%          | 14.94% | 11.11% | 4.55% | 9.09%  | 10.00%    |
|                              | Pregnancy                                           | 2.21%             | 7.71% | 5.56%  | 4.55% | 0.00% | 4.01%     | 2.95%           | 6.75%  | 0.00%  | 4.55% | 0.00%  | 2.85%     |
|                              | Habits                                              | 2.21%             | 5.78% | 5.56%  | 0.00% | 0.00% | 2.71%     | 4.06%           | 8.67%  | 0.00%  | 0.00% | 9.09%  | 4.36%     |
|                              | Clinical and family history                         | 2.58%             | 5.06% | 11.11% | 0.00% | 0.00% | 3.75%     | 2.21%           | 5.30%  | 5.56%  | 0.00% | 0.00%  | 2.61%     |
|                              | Identification                                      | 1.48%             | 4.58% | 0.00%  | 0.00% | 0.00% | 1.21%     | 0.00%           | 6.02%  | 0.00%  | 0.00% | 0.00%  | 1.20%     |
|                              | Death                                               | 4.06%             | 6.99% | 0.00%  | 0.00% | 0.00% | 2.21%     | 4.06%           | 9.64%  | 22.22% | 4.55% | 18.18% | 11.73%    |
|                              | Pathologies                                         | 0.74%             | 5.06% | 5.56%  | 0.00% | 0.00% | 2.27%     | 1.85%           | 5.30%  | 5.56%  | 4.55% | 0.00%  | 3.45%     |
|                              | $\bar{X}$                                           | 2.54%             | 6.05% | 4.86%  | 1.14% | 0.00% | -         | 3.83%           | 7.95%  | 5.56%  | 2.84% | 4.55%  | -         |
| PUD_2                        | Anthropometric evaluation                           | 2.58%             | 7.47% | 5.56%  | 0.00% | 0.00% | 3.12%     | 7.38%           | 7.71%  | 5.56%  | 4.55% | 0.00%  | 5.04%     |
|                              | Laboratory tests                                    | 0.37%             | 5.54% | 5.56%  | 4.55% | 0.00% | 3.20%     | 2.58%           | 4.34%  | 0.00%  | 0.00% | 0.00%  | 1.38%     |
|                              | Imaging exams                                       | 2.58%             | 5.78% | 5.56%  | 4.55% | 0.00% | 3.69%     | 4.43%           | 5.06%  | 11.11% | 4.55% | 0.00%  | 5.03%     |
|                              | Rapid tests                                         | 1.48%             | 6.02% | 5.56%  | 0.00% | 0.00% | 2.61%     | 4.43%           | 5.54%  | 11.11% | 0.00% | 9.09%  | 6.03%     |
|                              | Physical exams                                      | 1.48%             | 6.99% | 5.56%  | 0.00% | 0.00% | 2.80%     | 5.54%           | 5.78%  | 11.11% | 4.55% | 9.09%  | 7.21%     |
|                              | Electrocardiogram                                   | 2.58%             | 6.27% | 5.56%  | 0.00% | 0.00% | 2.88%     | 7.01%           | 5.78%  | 11.11% | 4.55% | 0.00%  | 5.69%     |
|                              | Vital parameters                                    | 0.74%             | 6.99% | 5.56%  | 0.00% | 0.00% | 2.66%     | 3.69%           | 5.06%  | 5.56%  | 4.55% | 0.00%  | 3.77%     |
|                              | $\bar{X}$                                           | 1.69%             | 6.44% | 5.56%  | 1.30% | 0.00% | -         | 5.01%           | 5.61%  | 7.94%  | 3.25% | 2.60%  | -         |
| PUD_3                        | Vaccination and immunization                        | 2.21%             | 5.30% | 5.56%  | 0.00% | 0.00% | 2.61%     | 2.95%           | 4.58%  | 0.00%  | 9.09% | 9.09%  | 5.14%     |
|                              | Screenings                                          | 3.69%             | 5.06% | 5.56%  | 0.00% | 0.00% | 2.86%     | 2.21%           | 4.10%  | 0.00%  | 4.55% | 9.09%  | 3.99%     |
|                              | Diet                                                | 4.43%             | 5.78% | 5.56%  | 0.00% | 0.00% | 3.15%     | 2.95%           | 6.99%  | 11.11% | 4.55% | 9.09%  | 6.94%     |
|                              | Physical activity                                   | 4.43%             | 6.02% | 5.56%  | 4.55% | 0.00% | 4.11%     | 5.54%           | 7.71%  | 11.11% | 0.00% | 9.09%  | 6.69%     |
|                              | Antimicrobial resistance                            | 4.43%             | 6.02% | 11.11% | 0.00% | 0.00% | 4.31%     | 4.06%           | 6.27%  | 11.11% | 4.55% | 0.00%  | 5.20%     |
|                              | Smoking                                             | 2.58%             | 7.95% | 5.56%  | 4.55% | 0.00% | 4.13%     | 3.69%           | 6.51%  | 5.56%  | 4.55% | 0.00%  | 4.06%     |
|                              | Epidemiology                                        | 4.06%             | 6.27% | 5.56%  | 0.00% | 0.00% | 3.18%     | 3.69%           | 4.10%  | 5.56%  | 4.55% | 0.00%  | 3.58%     |
|                              | $\bar{X}$                                           | 3.69%             | 6.06% | 6.35%  | 1.30% | 0.00% | -         | 3.58%           | 5.75%  | 6.35%  | 4.55% | 5.19%  | -         |
| PUD_4                        | Medicines                                           | 0.74%             | 3.37% | 5.56%  | 4.55% | 0.00% | 2.84%     | 1.11%           | 5.78%  | 5.56%  | 0.00% | 0.00%  | 2.49%     |
|                              | Pharmaceutical products                             | 1.85%             | 4.82% | 5.56%  | 0.00% | 0.00% | 2.44%     | 2.58%           | 6.75%  | 5.56%  | 4.55% | 0.00%  | 3.89%     |
|                              | Medical consumables                                 | 1.48%             | 6.99% | 0.00%  | 0.00% | 0.00% | 1.69%     | 5.90%           | 9.40%  | 16.67% | 0.00% | 9.09%  | 8.21%     |
|                              | Laboratory consumables                              | 2.95%             | 6.99% | 0.00%  | 0.00% | 0.00% | 1.99%     | 7.38%           | 9.64%  | 27.78% | 0.00% | 9.09%  | 10.78%    |
|                              | Drug interactions                                   | 2.21%             | 6.51% | 5.56%  | 0.00% | 0.00% | 2.86%     | 3.69%           | 5.54%  | 16.67% | 4.55% | 0.00%  | 6.09%     |
|                              | Dosage                                              | 1.48%             | 6.51% | 11.11% | 0.00% | 0.00% | 3.82%     | 3.32%           | 5.54%  | 5.56%  | 0.00% | 9.09%  | 4.70%     |
|                              | Technical information about healthcare technologies | 1.48%             | 6.27% | 5.56%  | 0.00% | 0.00% | 2.66%     | 5.90%           | 8.19%  | 11.11% | 9.09% | 0.00%  | 6.86%     |
|                              | $\bar{X}$                                           | 1.74%             | 5.92% | 4.76%  | 0.65% | 0.00% | -         | 4.27%           | 7.26%  | 12.70% | 2.60% | 3.90%  | -         |

| Primary information category | Secondary information category                           | Not useful at all |        |       |       |       |           | Not very useful |        |        |        |       |           |
|------------------------------|----------------------------------------------------------|-------------------|--------|-------|-------|-------|-----------|-----------------|--------|--------|--------|-------|-----------|
|                              |                                                          | Hpro              | Pati   | Admi  | Mana  | Pmkr  | $\bar{X}$ | Hpro            | Pati   | Admi   | Mana   | Pmkr  | $\bar{X}$ |
| PUD_5                        | Access to emergency services                             | 4.06%             | 6.99%  | 0.00% | 0.00% | 0.00% | 2.21%     | 4.80%           | 6.51%  | 0.00%  | 4.55%  | 0.00% | 3.17%     |
|                              | Access to appointments                                   | 1.48%             | 6.75%  | 0.00% | 4.55% | 0.00% | 2.55%     | 2.58%           | 5.78%  | 5.56%  | 0.00%  | 0.00% | 2.78%     |
|                              | Access to treatments                                     | 1.48%             | 6.51%  | 0.00% | 0.00% | 0.00% | 1.60%     | 2.21%           | 5.30%  | 5.56%  | 4.55%  | 0.00% | 3.52%     |
|                              | Access to surgeries                                      | 5.54%             | 7.71%  | 5.56% | 0.00% | 0.00% | 3.76%     | 3.32%           | 6.27%  | 11.11% | 9.09%  | 0.00% | 5.96%     |
|                              | $\bar{X}$                                                | 3.14%             | 6.99%  | 1.39% | 1.14% | 0.00% | -         | 3.23%           | 5.96%  | 5.56%  | 4.55%  | 0.00% | -         |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 8.12%             | 8.43%  | 0.00% | 4.55% | 0.00% | 4.22%     | 13.28%          | 10.60% | 16.67% | 13.64% | 0.00% | 10.84%    |
|                              | Cost with medicines                                      | 7.75%             | 8.92%  | 0.00% | 4.55% | 0.00% | 4.24%     | 12.55%          | 8.92%  | 11.11% | 4.55%  | 0.00% | 7.42%     |
|                              | Cost with pharmaceutical products                        | 8.12%             | 8.67%  | 0.00% | 4.55% | 0.00% | 4.27%     | 13.28%          | 9.64%  | 16.67% | 9.09%  | 9.09% | 11.55%    |
|                              | Cost with medical consumables                            | 9.23%             | 9.64%  | 5.56% | 4.55% | 0.00% | 5.79%     | 12.92%          | 10.36% | 16.67% | 9.09%  | 0.00% | 9.81%     |
|                              | Cost with laboratory consumables                         | 9.59%             | 9.88%  | 5.56% | 4.55% | 0.00% | 5.91%     | 14.02%          | 11.33% | 16.67% | 13.64% | 0.00% | 11.13%    |
|                              | Cost with human resources                                | 9.59%             | 9.16%  | 5.56% | 4.55% | 0.00% | 5.77%     | 13.65%          | 11.33% | 11.11% | 9.09%  | 9.09% | 10.85%    |
|                              | $\bar{X}$                                                | 8.73%             | 9.12%  | 2.78% | 4.55% | 0.00% | -         | 13.28%          | 10.36% | 14.81% | 9.85%  | 3.03% | -         |
| PUD_7                        | Average time of appointment                              | 5.90%             | 10.12% | 5.56% | 4.55% | 9.09% | 7.04%     | 11.81%          | 8.43%  | 5.56%  | 4.55%  | 0.00% | 6.07%     |
|                              | Average time of treatment                                | 5.17%             | 9.40%  | 5.56% | 0.00% | 9.09% | 5.84%     | 10.33%          | 7.95%  | 11.11% | 9.09%  | 0.00% | 7.70%     |
|                              | Average time of waiting                                  | 5.54%             | 12.53% | 5.56% | 0.00% | 9.09% | 6.54%     | 9.23%           | 7.71%  | 5.56%  | 4.55%  | 0.00% | 5.41%     |
|                              | Average time of management and administration            | 6.64%             | 12.05% | 5.56% | 0.00% | 9.09% | 6.67%     | 10.33%          | 8.67%  | 11.11% | 13.64% | 9.09% | 10.57%    |
|                              | $\bar{X}$                                                | 5.81%             | 11.02% | 5.56% | 1.14% | 9.09% | -         | 10.42%          | 8.19%  | 8.33%  | 7.95%  | 2.27% | -         |

Table 48. (continued)

| Primary information category | Secondary information category | Moderately useful |        |        |        |        |           |
|------------------------------|--------------------------------|-------------------|--------|--------|--------|--------|-----------|
|                              |                                | Hpro              | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances     | 8.86%             | 9.88%  | 33.33% | 13.64% | 9.09%  | 14.96%    |
|                              | Demography                     | 20.66%            | 20.24% | 22.22% | 9.09%  | 18.18% | 18.08%    |
|                              | Pregnancy                      | 8.86%             | 13.25% | 16.67% | 0.00%  | 9.09%  | 9.57%     |
|                              | Habits                         | 11.81%            | 20.00% | 27.78% | 13.64% | 9.09%  | 16.46%    |
|                              | Clinical and family history    | 8.12%             | 11.08% | 16.67% | 0.00%  | 9.09%  | 8.99%     |
|                              | Identification                 | 7.38%             | 13.73% | 22.22% | 18.18% | 27.27% | 17.76%    |
|                              | Death                          | 13.28%            | 16.63% | 27.78% | 13.64% | 18.18% | 17.90%    |
|                              | Pathologies                    | 7.01%             | 10.60% | 27.78% | 4.55%  | 9.09%  | 11.81%    |
|                              | $\bar{X}$                      | 10.75%            | 14.43% | 24.31% | 9.09%  | 13.64% | -         |
| PUD_2                        | Anthropometric evaluation      | 13.28%            | 20.00% | 16.67% | 18.18% | 9.09%  | 15.44%    |
|                              | Laboratory tests               | 9.96%             | 11.33% | 16.67% | 4.55%  | 9.09%  | 10.32%    |
|                              | Imaging exams                  | 10.70%            | 12.05% | 5.56%  | 4.55%  | 9.09%  | 8.39%     |
|                              | Rapid tests                    | 15.87%            | 14.70% | 5.56%  | 22.73% | 18.18% | 15.41%    |
|                              | Physical exams                 | 13.65%            | 12.53% | 5.56%  | 18.18% | 9.09%  | 11.80%    |
|                              | Electrocardiogram              | 14.02%            | 12.53% | 5.56%  | 18.18% | 9.09%  | 11.88%    |
|                              | Vital parameters               | 13.28%            | 12.53% | 5.56%  | 9.09%  | 9.09%  | 9.91%     |
|                              | $\bar{X}$                      | 12.97%            | 13.67% | 8.73%  | 13.64% | 10.39% | -         |

| Primary information category | Secondary information category                           | Moderately useful |        |        |        |        |           |
|------------------------------|----------------------------------------------------------|-------------------|--------|--------|--------|--------|-----------|
|                              |                                                          | Hpro              | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
| PUD_3                        | Vaccination and immunization                             | 10.33%            | 10.12% | 22.22% | 4.55%  | 9.09%  | 11.26%    |
|                              | Screenings                                               | 11.07%            | 12.53% | 27.78% | 9.09%  | 18.18% | 15.73%    |
|                              | Diet                                                     | 13.65%            | 18.80% | 11.11% | 13.64% | 27.27% | 16.89%    |
|                              | Physical activity                                        | 15.13%            | 20.24% | 11.11% | 9.09%  | 27.27% | 16.57%    |
|                              | Antimicrobial resistance                                 | 12.92%            | 13.25% | 11.11% | 18.18% | 9.09%  | 12.91%    |
|                              | Smoking                                                  | 12.18%            | 16.14% | 22.22% | 9.09%  | 18.18% | 15.56%    |
|                              | Epidemiology                                             | 11.81%            | 14.94% | 16.67% | 13.64% | 18.18% | 15.05%    |
| $\bar{X}$                    |                                                          | 12.44%            | 15.15% | 17.46% | 11.04% | 18.18% | -         |
| PUD_4                        | Medicines                                                | 6.27%             | 10.36% | 11.11% | 4.55%  | 9.09%  | 8.28%     |
|                              | Pharmaceutical products                                  | 10.33%            | 13.98% | 11.11% | 27.27% | 9.09%  | 14.36%    |
|                              | Medical consumables                                      | 19.19%            | 17.59% | 16.67% | 22.73% | 9.09%  | 17.05%    |
|                              | Laboratory consumables                                   | 18.45%            | 18.80% | 5.56%  | 31.82% | 9.09%  | 16.74%    |
|                              | Drug interactions                                        | 7.75%             | 11.33% | 22.22% | 9.09%  | 9.09%  | 11.90%    |
|                              | Dosage                                                   | 9.59%             | 11.57% | 22.22% | 18.18% | 9.09%  | 14.13%    |
|                              | Technical information about healthcare technologies      | 12.92%            | 13.98% | 22.22% | 18.18% | 9.09%  | 15.28%    |
| $\bar{X}$                    |                                                          | 12.07%            | 13.94% | 15.87% | 18.83% | 9.09%  | -         |
| PUD_5                        | Access to emergency services                             | 11.07%            | 11.81% | 11.11% | 13.64% | 18.18% | 13.16%    |
|                              | Access to appointments                                   | 13.28%            | 9.64%  | 5.56%  | 9.09%  | 9.09%  | 9.33%     |
|                              | Access to treatments                                     | 12.18%            | 11.33% | 11.11% | 9.09%  | 9.09%  | 10.56%    |
|                              | Access to surgeries                                      | 12.92%            | 10.60% | 5.56%  | 4.55%  | 9.09%  | 8.54%     |
| $\bar{X}$                    |                                                          | 12.36%            | 10.84% | 8.33%  | 9.09%  | 11.36% | -         |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 20.66%            | 15.66% | 16.67% | 22.73% | 18.18% | 18.78%    |
|                              | Cost with medicines                                      | 17.34%            | 13.98% | 16.67% | 13.64% | 18.18% | 15.96%    |
|                              | Cost with pharmaceutical products                        | 18.82%            | 15.66% | 11.11% | 13.64% | 18.18% | 15.48%    |
|                              | Cost with medical consumables                            | 20.66%            | 17.59% | 11.11% | 18.18% | 36.36% | 20.78%    |
|                              | Cost with laboratory consumables                         | 22.14%            | 17.59% | 11.11% | 18.18% | 36.36% | 21.08%    |
|                              | Cost with human resources                                | 20.30%            | 20.48% | 16.67% | 27.27% | 27.27% | 22.40%    |
| $\bar{X}$                    |                                                          | 19.99%            | 16.83% | 13.89% | 18.94% | 25.76% | -         |
| PUD_7                        | Average time of appointment                              | 18.45%            | 22.65% | 16.67% | 22.73% | 27.27% | 21.55%    |
|                              | Average time of treatment                                | 16.97%            | 20.48% | 11.11% | 27.27% | 18.18% | 18.80%    |
|                              | Average time of waiting                                  | 18.82%            | 17.59% | 11.11% | 36.36% | 18.18% | 20.41%    |
|                              | Average time of management and administration            | 21.77%            | 23.13% | 11.11% | 27.27% | 9.09%  | 18.48%    |
| $\bar{X}$                    |                                                          | 19.00%            | 20.96% | 12.50% | 28.41% | 18.18% | -         |

Table 48. (continued)

| Primary information category | Secondary information category | Useful |        |        |        |        |           | Very useful |        |        |        |        |           |
|------------------------------|--------------------------------|--------|--------|--------|--------|--------|-----------|-------------|--------|--------|--------|--------|-----------|
|                              |                                | Hpro   | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ | Hpro        | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances     | 18.82% | 34.70% | 38.89% | 22.73% | 27.27% | 28.48%    | 64.21%      | 42.65% | 22.22% | 59.09% | 63.64% | 50.36%    |
|                              | Demography                     | 40.22% | 37.83% | 38.89% | 45.45% | 45.45% | 41.57%    | 24.72%      | 19.52% | 22.22% | 36.36% | 27.27% | 26.02%    |

| Primary information category | Secondary information category                           | Useful |        |        |        |        |           | Very useful |        |        |        |        |           |
|------------------------------|----------------------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------|--------|--------|--------|--------|-----------|
|                              |                                                          | Hpro   | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ | Hpro        | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
|                              | Pregnancy                                                | 33.95% | 34.46% | 33.33% | 31.82% | 36.36% | 33.98%    | 52.03%      | 37.83% | 44.44% | 59.09% | 54.55% | 49.59%    |
|                              | Habits                                                   | 38.01% | 40.24% | 33.33% | 36.36% | 27.27% | 35.04%    | 43.91%      | 25.30% | 33.33% | 50.00% | 54.55% | 41.42%    |
|                              | Clinical and family history                              | 29.52% | 32.77% | 27.78% | 45.45% | 27.27% | 32.56%    | 57.56%      | 45.78% | 38.89% | 54.55% | 63.64% | 52.08%    |
|                              | Identification                                           | 31.37% | 38.80% | 38.89% | 27.27% | 36.36% | 34.54%    | 59.78%      | 36.87% | 38.89% | 54.55% | 36.36% | 45.29%    |
|                              | Death                                                    | 37.64% | 37.35% | 22.22% | 40.91% | 27.27% | 33.08%    | 40.96%      | 29.40% | 27.78% | 40.91% | 36.36% | 35.08%    |
|                              | Pathologies                                              | 21.40% | 29.16% | 16.67% | 27.27% | 27.27% | 24.35%    | 69.00%      | 49.88% | 44.44% | 63.64% | 63.64% | 58.12%    |
|                              | $\bar{X}$                                                | 31.37% | 35.66% | 31.25% | 34.66% | 31.82% | -         | 51.52%      | 35.90% | 34.03% | 52.27% | 50.00% | -         |
| PUD_2                        | Anthropometric evaluation                                | 39.48% | 39.28% | 44.44% | 36.36% | 63.64% | 44.64%    | 37.27%      | 25.54% | 27.78% | 40.91% | 27.27% | 31.75%    |
|                              | Laboratory tests                                         | 26.20% | 32.77% | 38.89% | 36.36% | 45.45% | 35.94%    | 60.89%      | 46.02% | 38.89% | 54.55% | 45.45% | 49.16%    |
|                              | Imaging exams                                            | 27.68% | 31.08% | 44.44% | 45.45% | 45.45% | 38.82%    | 54.61%      | 46.02% | 33.33% | 40.91% | 45.45% | 44.07%    |
|                              | Rapid tests                                              | 36.16% | 35.90% | 55.56% | 31.82% | 36.36% | 39.16%    | 42.07%      | 37.83% | 22.22% | 45.45% | 36.36% | 36.79%    |
|                              | Physical exams                                           | 34.69% | 35.18% | 55.56% | 36.36% | 45.45% | 41.45%    | 44.65%      | 39.52% | 22.22% | 40.91% | 36.36% | 36.73%    |
|                              | Electrocardiogram                                        | 31.73% | 31.81% | 38.89% | 36.36% | 45.45% | 36.85%    | 44.65%      | 43.61% | 38.89% | 40.91% | 45.45% | 42.70%    |
|                              | Vital parameters                                         | 32.84% | 34.22% | 50.00% | 36.36% | 45.45% | 39.78%    | 49.45%      | 41.20% | 33.33% | 50.00% | 45.45% | 43.89%    |
|                              | $\bar{X}$                                                | 32.68% | 34.32% | 46.83% | 37.01% | 46.75% | -         | 47.65%      | 39.97% | 30.95% | 44.81% | 40.26% | -         |
| PUD_3                        | Vaccination and immunization                             | 31.73% | 28.43% | 38.89% | 22.73% | 36.36% | 31.63%    | 52.77%      | 51.57% | 33.33% | 63.64% | 45.45% | 49.35%    |
|                              | Screenings                                               | 37.64% | 28.67% | 27.78% | 40.91% | 36.36% | 34.27%    | 45.39%      | 49.64% | 38.89% | 45.45% | 36.36% | 43.15%    |
|                              | Diet                                                     | 41.33% | 39.28% | 50.00% | 59.09% | 27.27% | 43.39%    | 37.64%      | 29.16% | 22.22% | 22.73% | 36.36% | 29.62%    |
|                              | Physical activity                                        | 40.96% | 35.90% | 44.44% | 63.64% | 27.27% | 42.44%    | 33.95%      | 30.12% | 27.78% | 22.73% | 36.36% | 30.19%    |
|                              | Antimicrobial resistance                                 | 25.46% | 35.42% | 27.78% | 31.82% | 27.27% | 29.55%    | 53.14%      | 39.04% | 38.89% | 45.45% | 63.64% | 48.03%    |
|                              | Smoking                                                  | 35.42% | 37.11% | 27.78% | 31.82% | 36.36% | 33.70%    | 46.13%      | 32.29% | 38.89% | 50.00% | 45.45% | 42.55%    |
|                              | Epidemiology                                             | 39.48% | 34.94% | 33.33% | 36.36% | 36.36% | 36.10%    | 40.96%      | 39.76% | 38.89% | 45.45% | 45.45% | 42.10%    |
|                              | $\bar{X}$                                                | 36.00% | 34.25% | 35.71% | 40.91% | 32.47% | -         | 44.28%      | 38.80% | 34.13% | 42.21% | 44.16% | -         |
| PUD_4                        | Medicines                                                | 26.57% | 28.43% | 33.33% | 31.82% | 45.45% | 33.12%    | 65.31%      | 52.05% | 44.44% | 59.09% | 45.45% | 53.27%    |
|                              | Pharmaceutical products                                  | 36.53% | 34.22% | 33.33% | 45.45% | 45.45% | 39.00%    | 48.71%      | 40.24% | 44.44% | 22.73% | 45.45% | 40.32%    |
|                              | Medical consumables                                      | 38.38% | 35.66% | 33.33% | 54.55% | 63.64% | 45.11%    | 35.06%      | 30.36% | 33.33% | 22.73% | 18.18% | 27.93%    |
|                              | Laboratory consumables                                   | 39.48% | 34.46% | 33.33% | 50.00% | 63.64% | 44.18%    | 31.73%      | 30.12% | 33.33% | 18.18% | 18.18% | 26.31%    |
|                              | Drug interactions                                        | 26.57% | 33.73% | 22.22% | 31.82% | 45.45% | 31.96%    | 59.78%      | 42.89% | 33.33% | 54.55% | 45.45% | 47.20%    |
|                              | Dosage                                                   | 27.31% | 31.08% | 27.78% | 27.27% | 45.45% | 31.78%    | 58.30%      | 45.30% | 33.33% | 54.55% | 36.36% | 45.57%    |
|                              | Technical information about healthcare technologies      | 35.06% | 35.90% | 33.33% | 54.55% | 45.45% | 40.86%    | 44.65%      | 35.66% | 27.78% | 18.18% | 45.45% | 34.35%    |
|                              | $\bar{X}$                                                | 32.84% | 33.36% | 30.95% | 42.21% | 50.65% | -         | 49.08%      | 39.52% | 35.71% | 35.71% | 36.36% | -         |
| PUD_5                        | Access to emergency services                             | 33.21% | 30.36% | 44.44% | 31.82% | 36.36% | 35.24%    | 46.86%      | 44.34% | 44.44% | 50.00% | 45.45% | 46.22%    |
|                              | Access to appointments                                   | 36.16% | 31.33% | 44.44% | 36.36% | 45.45% | 38.75%    | 46.49%      | 46.51% | 44.44% | 50.00% | 45.45% | 46.58%    |
|                              | Access to treatments                                     | 36.53% | 30.84% | 38.89% | 31.82% | 45.45% | 36.71%    | 47.60%      | 46.02% | 44.44% | 54.55% | 45.45% | 47.61%    |
|                              | Access to surgeries                                      | 33.95% | 29.88% | 33.33% | 31.82% | 45.45% | 34.89%    | 44.28%      | 45.54% | 44.44% | 54.55% | 45.45% | 46.85%    |
|                              | $\bar{X}$                                                | 34.96% | 30.60% | 40.28% | 32.95% | 43.18% | -         | 46.31%      | 45.60% | 44.44% | 52.27% | 45.45% | -         |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 28.04% | 36.39% | 38.89% | 22.73% | 27.27% | 30.66%    | 29.89%      | 28.92% | 27.78% | 36.36% | 54.55% | 35.50%    |
|                              | Cost with medicines                                      | 32.47% | 35.18% | 44.44% | 22.73% | 36.36% | 34.24%    | 29.89%      | 33.01% | 27.78% | 54.55% | 45.45% | 38.14%    |
|                              | Cost with pharmaceutical products                        | 30.63% | 36.63% | 44.44% | 27.27% | 27.27% | 33.25%    | 29.15%      | 29.40% | 27.78% | 45.45% | 45.45% | 35.45%    |
|                              | Cost with medical consumables                            | 31.37% | 37.35% | 44.44% | 22.73% | 27.27% | 32.63%    | 25.83%      | 25.06% | 22.22% | 45.45% | 36.36% | 30.99%    |

| Primary information category | Secondary information category                | Useful |        |        |        |        |           | Very useful |        |        |        |        |           |
|------------------------------|-----------------------------------------------|--------|--------|--------|--------|--------|-----------|-------------|--------|--------|--------|--------|-----------|
|                              |                                               | Hpro   | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ | Hpro        | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
|                              | Cost with laboratory consumables              | 29.52% | 35.42% | 44.44% | 27.27% | 27.27% | 32.79%    | 24.72%      | 25.78% | 22.22% | 36.36% | 36.36% | 29.09%    |
|                              | Cost with human resources                     | 29.15% | 33.73% | 44.44% | 9.09%  | 36.36% | 30.56%    | 27.31%      | 25.30% | 22.22% | 50.00% | 27.27% | 30.42%    |
|                              | $\bar{X}$                                     | 30.20% | 35.78% | 43.52% | 21.97% | 30.30% | -         | 27.80%      | 27.91% | 25.00% | 44.70% | 40.91% | -         |
| PUD_7                        | Average time of appointment                   | 38.38% | 33.25% | 44.44% | 31.82% | 36.36% | 36.85%    | 25.46%      | 25.54% | 27.78% | 36.36% | 27.27% | 28.48%    |
|                              | Average time of treatment                     | 43.17% | 35.90% | 44.44% | 22.73% | 45.45% | 38.34%    | 24.35%      | 26.27% | 27.78% | 40.91% | 27.27% | 29.32%    |
|                              | Average time of waiting                       | 39.85% | 32.05% | 50.00% | 18.18% | 45.45% | 37.11%    | 26.57%      | 30.12% | 27.78% | 40.91% | 27.27% | 30.53%    |
|                              | Average time of management and administration | 38.38% | 32.05% | 44.44% | 27.27% | 36.36% | 35.70%    | 22.88%      | 24.10% | 27.78% | 31.82% | 36.36% | 28.59%    |
|                              | $\bar{X}$                                     | 39.94% | 33.31% | 45.83% | 25.00% | 40.91% | -         | 24.82%      | 26.51% | 27.78% | 37.50% | 29.55% | -         |

## Annex XVII – Healthcare professionals' perspectives about healthcare data utility: standard deviation

Table 49. Healthcare professionals' perspectives about healthcare data utility: standard deviation

| Primary information category | Secondary information category                      | Standard deviation |      |      |      |      |      |      |           |
|------------------------------|-----------------------------------------------------|--------------------|------|------|------|------|------|------|-----------|
|                              |                                                     | Phar               | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |
| PUD_1 <sup>a)</sup>          | Allergies and intolerances                          | 1.08               | 0.84 | 0.98 | 1.05 | 1.51 | 1.22 | 0.42 | 1.01      |
|                              | Demography                                          | 1.07               | 1.02 | 1.05 | 1.12 | 1.24 | 1.21 | 0.88 | 1.08      |
|                              | Pregnancy                                           | 1.06               | 0.74 | 0.87 | 1.18 | 0.60 | 1.22 | 0.52 | 0.88      |
|                              | Habits                                              | 0.93               | 0.80 | 0.91 | 1.16 | 1.27 | 1.13 | 0.70 | 0.98      |
|                              | Clinical and family history                         | 1.10               | 0.97 | 0.77 | 1.07 | 1.15 | 0.90 | 0.53 | 0.93      |
|                              | Identification                                      | 1.06               | 0.53 | 0.61 | 1.04 | 0.51 | 0.88 | 0.48 | 0.73      |
|                              | Death                                               | 1.03               | 0.87 | 1.08 | 1.24 | 1.31 | 0.74 | 0.48 | 0.97      |
|                              | Pathologies                                         | 0.95               | 0.65 | 0.71 | 0.95 | 0.75 | 0.83 | 0.48 | 0.76      |
|                              | $\bar{X}$                                           | 1.03               | 0.80 | 0.87 | 1.10 | 1.04 | 1.02 | 0.56 | -         |
| PUD_2 <sup>a)</sup>          | Anthropometric evaluation                           | 0.89               | 1.17 | 0.92 | 0.99 | 1.16 | 1.21 | 0.53 | 0.98      |
|                              | Laboratory tests                                    | 1.03               | 0.65 | 0.76 | 0.84 | 0.97 | 0.74 | 0.42 | 0.77      |
|                              | Imaging exams                                       | 1.12               | 0.64 | 1.07 | 0.59 | 1.23 | 0.82 | 1.10 | 0.94      |
|                              | Rapid tests                                         | 0.99               | 0.78 | 0.99 | 0.92 | 0.97 | 0.77 | 1.16 | 0.94      |
|                              | Physical exams                                      | 1.02               | 0.89 | 0.93 | 0.99 | 0.87 | 1.22 | 0.82 | 0.96      |
|                              | Electrocardiogram                                   | 1.13               | 0.78 | 1.03 | 1.04 | 1.24 | 1.33 | 1.03 | 1.08      |
|                              | Vital parameters                                    | 0.98               | 0.86 | 0.78 | 0.92 | 1.07 | 0.92 | 0.67 | 0.89      |
|                              | $\bar{X}$                                           | 1.02               | 0.82 | 0.93 | 0.90 | 1.07 | 1.00 | 0.82 | -         |
| PUD_3 <sup>a)</sup>          | Vaccination and immunization                        | 0.97               | 0.82 | 0.81 | 1.23 | 0.72 | 0.94 | 1.14 | 0.95      |
|                              | Screenings                                          | 1.06               | 1.00 | 0.81 | 1.16 | 1.14 | 0.64 | 1.20 | 1.00      |
|                              | Diet                                                | 1.00               | 1.17 | 0.92 | 1.03 | 1.06 | 1.25 | 0.52 | 0.99      |
|                              | Physical activity                                   | 1.07               | 1.13 | 1.01 | 1.02 | 1.15 | 1.32 | 0.52 | 1.03      |
|                              | Antimicrobial resistance                            | 1.02               | 1.14 | 1.01 | 1.23 | 1.15 | 0.74 | 1.34 | 1.09      |
|                              | Smoking                                             | 1.14               | 0.99 | 0.86 | 1.00 | 1.08 | 1.13 | 0.48 | 0.96      |
|                              | Epidemiology                                        | 1.01               | 1.13 | 0.95 | 1.08 | 1.16 | 0.99 | 0.74 | 1.01      |
|                              | $\bar{X}$                                           | 1.04               | 1.05 | 0.91 | 1.11 | 1.07 | 1.00 | 0.85 | -         |
| PUD_4 <sup>a)</sup>          | Medicines                                           | 0.86               | 0.62 | 0.67 | 0.84 | 0.94 | 0.74 | 0.70 | 0.77      |
|                              | Pharmaceutical products                             | 0.86               | 0.85 | 0.87 | 0.98 | 0.94 | 1.10 | 0.70 | 0.90      |
|                              | Medical consumables                                 | 0.92               | 0.94 | 0.89 | 0.97 | 1.38 | 0.80 | 1.17 | 1.01      |
|                              | Laboratory consumables                              | 1.08               | 0.95 | 1.00 | 1.12 | 1.15 | 0.72 | 1.17 | 1.03      |
|                              | Drug interactions                                   | 1.08               | 0.86 | 0.91 | 0.92 | 1.00 | 1.11 | 0.94 | 0.97      |
|                              | Dosage                                              | 0.86               | 0.80 | 0.75 | 1.05 | 1.24 | 1.31 | 0.82 | 0.97      |
|                              | Technical information about healthcare technologies | 1.09               | 0.92 | 1.00 | 0.72 | 0.98 | 0.83 | 0.99 | 0.93      |

| Primary information category | Secondary information category                           | Standard deviation |      |      |      |      |      |      |           |
|------------------------------|----------------------------------------------------------|--------------------|------|------|------|------|------|------|-----------|
|                              |                                                          | Phar               | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |
|                              | $\bar{X}$                                                | 0.96               | 0.85 | 0.87 | 0.94 | 1.09 | 0.94 | 0.93 | -         |
| PUD_5 <sup>a)</sup>          | Access to emergency services                             | 1.06               | 0.92 | 1.21 | 1.02 | 0.95 | 0.64 | 0.82 | 0.95      |
|                              | Access to appointments                                   | 1.07               | 0.95 | 0.81 | 0.95 | 0.72 | 0.70 | 0.74 | 0.85      |
|                              | Access to treatments                                     | 1.02               | 0.87 | 0.76 | 0.95 | 1.16 | 0.62 | 0.88 | 0.89      |
|                              | Access to surgeries                                      | 1.06               | 1.03 | 1.21 | 0.88 | 1.38 | 0.64 | 0.88 | 1.01      |
|                              | $\bar{X}$                                                | 1.05               | 0.94 | 1.00 | 0.95 | 1.05 | 0.65 | 0.83 | -         |
| PUD_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 1.13               | 1.39 | 1.21 | 1.21 | 1.51 | 1.40 | 1.25 | 1.30      |
|                              | Cost with medicines                                      | 1.06               | 1.33 | 1.18 | 1.24 | 1.51 | 1.35 | 1.25 | 1.28      |
|                              | Cost with pharmaceutical products                        | 0.96               | 1.37 | 1.20 | 1.24 | 1.51 | 1.47 | 1.25 | 1.29      |
|                              | Cost with medical consumables                            | 1.09               | 1.39 | 1.19 | 1.22 | 1.51 | 1.40 | 1.25 | 1.29      |
|                              | Cost with laboratory consumables                         | 1.08               | 1.35 | 1.23 | 1.22 | 1.51 | 1.53 | 1.25 | 1.31      |
|                              | Cost with human resources                                | 1.05               | 1.46 | 1.25 | 1.16 | 1.51 | 1.53 | 1.07 | 1.29      |
|                              | $\bar{X}$                                                | 1.06               | 1.38 | 1.21 | 1.22 | 1.51 | 1.45 | 1.22 | -         |
| PUD_7 <sup>a)</sup>          | Average time of appointment                              | 1.11               | 1.26 | 1.06 | 1.21 | 1.30 | 1.19 | 1.10 | 1.18      |
|                              | Average time of treatment                                | 1.03               | 1.11 | 1.03 | 1.16 | 1.30 | 1.18 | 1.25 | 1.15      |
|                              | Average time of waiting                                  | 1.14               | 1.08 | 1.05 | 1.21 | 1.11 | 1.30 | 1.34 | 1.18      |
|                              | Average time of management and administration            | 1.11               | 1.20 | 1.05 | 1.11 | 1.30 | 1.24 | 1.45 | 1.21      |
|                              | $\bar{X}$                                                | 1.10               | 1.16 | 1.05 | 1.17 | 1.26 | 1.23 | 1.28 | -         |

a) 5-Likert utility scale: 1 - Not useful at all; 2 - Not very useful; 3 - Moderately useful; 4 - Useful; 5 - Very useful

## Annex XVIII – Healthcare professionals' perspectives about healthcare data: utility analysis (%)

Table 50. Healthcare professionals' perspectives about healthcare data: utility analysis (%)

| Primary information category | Secondary information category | Not useful at all |      |      |      |       |      |       |           | Not very useful |       |       |       |       |       |       |           |
|------------------------------|--------------------------------|-------------------|------|------|------|-------|------|-------|-----------|-----------------|-------|-------|-------|-------|-------|-------|-----------|
|                              |                                | Phar              | Phys | Nurs | Sdtt | Psyc  | Sht  | Nutr  | $\bar{X}$ | Phar            | Phys  | Nurs  | Sdtt  | Psyc  | Sht   | Nutr  | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances     | 5.26              | 0.00 | 1.89 | 3.13 | 16.67 | 6.67 | 0.00  | 4.80      | 2.63            | 3.45  | 5.66  | 6.25  | 25.00 | 0.00  | 0.00  | 6.14      |
|                              | Demography                     | 5.26              | 1.72 | 1.89 | 9.38 | 16.67 | 6.67 | 0.00  | 5.94      | 5.26            | 10.34 | 13.21 | 3.13  | 8.33  | 26.67 | 0.00  | 9.56      |
|                              | Pregnancy                      | 5.26              | 0.00 | 0.94 | 6.25 | 0.00  | 6.67 | 0.00  | 2.73      | 2.63            | 1.72  | 4.72  | 3.13  | 0.00  | 0.00  | 0.00  | 1.74      |
|                              | Habits                         | 2.63              | 0.00 | 0.94 | 6.25 | 8.33  | 6.67 | 0.00  | 3.55      | 2.63            | 3.45  | 5.66  | 6.25  | 0.00  | 0.00  | 0.00  | 2.57      |
|                              | Clinical and family history    | 5.26              | 3.45 | 0.00 | 6.25 | 8.33  | 0.00 | 0.00  | 3.33      | 2.63            | 3.45  | 2.83  | 0.00  | 0.00  | 0.00  | 0.00  | 1.27      |
|                              | Identification                 | 5.26              | 0.00 | 0.00 | 6.25 | 0.00  | 0.00 | 0.00  | 1.64      | 0.00            | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00      |
|                              | Death                          | 2.63              | 3.45 | 2.83 | 9.38 | 16.67 | 0.00 | 0.00  | 4.99      | 5.26            | 0.00  | 7.55  | 3.13  | 0.00  | 0.00  | 0.00  | 2.28      |
|                              | Pathologies                    | 2.63              | 0.00 | 0.00 | 3.13 | 0.00  | 0.00 | 0.00  | 0.82      | 2.63            | 1.72  | 1.89  | 3.13  | 0.00  | 0.00  | 0.00  | 1.34      |
|                              | $\bar{X}$                      | 4.28              | 1.08 | 1.06 | 6.25 | 8.33  | 3.33 | 0.00  | -         | 2.96            | 3.02  | 5.19  | 3.13  | 4.17  | 3.33  | 0.00  | -         |
| PUD_2                        | Anthropometric evaluation      | 2.63              | 3.45 | 1.89 | 0.00 | 8.33  | 6.67 | 0.00  | 3.28      | 7.89            | 13.79 | 2.83  | 12.50 | 8.33  | 6.67  | 0.00  | 7.43      |
|                              | Laboratory tests               | 2.63              | 0.00 | 0.00 | 0.00 | 0.00  | 0.00 | 0.00  | 0.38      | 5.26            | 1.72  | 1.89  | 3.13  | 8.33  | 0.00  | 0.00  | 2.90      |
|                              | Imaging exams                  | 5.26              | 0.00 | 3.77 | 0.00 | 8.33  | 0.00 | 0.00  | 2.48      | 7.89            | 1.72  | 4.72  | 0.00  | 16.67 | 0.00  | 10.00 | 5.86      |
|                              | Rapid tests                    | 2.63              | 0.00 | 2.83 | 0.00 | 0.00  | 0.00 | 0.00  | 0.78      | 5.26            | 3.45  | 2.83  | 6.25  | 8.33  | 0.00  | 20.00 | 6.59      |
|                              | Physical exams                 | 2.63              | 0.00 | 1.89 | 0.00 | 0.00  | 6.67 | 0.00  | 1.60      | 10.53           | 5.17  | 2.83  | 9.38  | 8.33  | 6.67  | 0.00  | 6.13      |
|                              | Electrocardiogram              | 2.63              | 0.00 | 3.77 | 0.00 | 8.33  | 6.67 | 0.00  | 3.06      | 13.16           | 3.45  | 2.83  | 12.50 | 16.67 | 13.33 | 10.00 | 10.28     |
|                              | Vital parameters               | 2.63              | 0.00 | 0.00 | 0.00 | 8.33  | 0.00 | 0.00  | 1.57      | 5.26            | 5.17  | 2.83  | 6.25  | 0.00  | 0.00  | 0.00  | 2.79      |
|                              | $\bar{X}$                      | 3.01              | 0.49 | 2.02 | 0.00 | 4.76  | 2.86 | 0.00  | -         | 7.89            | 4.93  | 2.96  | 7.14  | 9.52  | 3.81  | 5.71  | -         |
| PUD_3                        | Vaccination and immunization   | 2.63              | 1.72 | 1.89 | 6.25 | 0.00  | 0.00 | 0.00  | 1.78      | 2.63            | 0.00  | 0.94  | 9.38  | 0.00  | 6.67  | 20.00 | 5.66      |
|                              | Screenings                     | 5.26              | 3.45 | 0.94 | 9.38 | 8.33  | 0.00 | 10.00 | 5.34      | 2.63            | 3.45  | 1.89  | 3.13  | 0.00  | 0.00  | 0.00  | 1.58      |
|                              | Diet                           | 5.26              | 6.90 | 1.89 | 6.25 | 8.33  | 6.67 | 0.00  | 5.04      | 2.63            | 3.45  | 3.77  | 0.00  | 0.00  | 6.67  | 0.00  | 2.36      |
|                              | Physical activity              | 5.26              | 5.17 | 2.83 | 6.25 | 8.33  | 6.67 | 0.00  | 4.93      | 5.26            | 5.17  | 6.60  | 0.00  | 8.33  | 13.33 | 0.00  | 5.53      |
|                              | Antimicrobial resistance       | 5.26              | 5.17 | 2.83 | 6.25 | 8.33  | 0.00 | 10.00 | 5.41      | 0.00            | 3.45  | 4.72  | 6.25  | 8.33  | 0.00  | 10.00 | 4.68      |
|                              | Smoking                        | 7.89              | 1.72 | 0.00 | 3.13 | 8.33  | 6.67 | 0.00  | 3.96      | 0.00            | 6.90  | 4.72  | 3.13  | 0.00  | 0.00  | 0.00  | 2.11      |
|                              | Epidemiology                   | 5.26              | 6.90 | 1.89 | 6.25 | 8.33  | 0.00 | 0.00  | 4.09      | 0.00            | 3.45  | 5.66  | 0.00  | 8.33  | 6.67  | 0.00  | 3.44      |
|                              | $\bar{X}$                      | 5.26              | 4.43 | 1.75 | 6.25 | 7.14  | 2.86 | 2.86  | -         | 1.88            | 3.69  | 4.04  | 3.13  | 3.57  | 4.76  | 4.29  | -         |
| PUD_4                        | Medicines                      | 2.63              | 0.00 | 0.00 | 3.13 | 0.00  | 0.00 | 0.00  | 0.82      | 0.00            | 0.00  | 1.89  | 0.00  | 8.33  | 0.00  | 0.00  | 1.46      |
|                              | Pharmaceutical products        | 2.63              | 1.72 | 0.94 | 3.13 | 0.00  | 6.67 | 0.00  | 2.16      | 0.00            | 0.00  | 3.77  | 6.25  | 8.33  | 0.00  | 0.00  | 2.62      |
|                              | Medical consumables            | 2.63              | 1.72 | 0.94 | 0.00 | 8.33  | 0.00 | 0.00  | 1.95      | 2.63            | 3.45  | 4.72  | 9.38  | 16.67 | 0.00  | 30.00 | 9.55      |
|                              | Laboratory consumables         | 5.26              | 1.72 | 1.89 | 6.25 | 8.33  | 0.00 | 0.00  | 3.35      | 5.26            | 3.45  | 8.49  | 9.38  | 8.33  | 0.00  | 30.00 | 9.27      |
|                              | Drug interactions              | 5.26              | 1.72 | 1.89 | 0.00 | 0.00  | 6.67 | 0.00  | 2.22      | 2.63            | 1.72  | 3.77  | 6.25  | 8.33  | 0.00  | 10.00 | 4.67      |
|                              | Dosage                         | 2.63              | 0.00 | 0.00 | 3.13 | 8.33  | 6.67 | 0.00  | 2.97      | 0.00            | 3.45  | 2.83  | 6.25  | 8.33  | 6.67  | 0.00  | 3.93      |
|                              | Technical information about    | 2.63              | 0.00 | 2.83 | 0.00 | 0.00  | 0.00 | 0.00  | 0.78      | 7.89            | 6.90  | 4.72  | 3.13  | 16.67 | 0.00  | 10.00 | 7.04      |
|                              | $\bar{X}$                      | 2.63              | 0.00 | 0.00 | 3.13 | 0.00  | 0.00 | 0.00  | 0.82      | 0.00            | 0.00  | 1.89  | 0.00  | 8.33  | 0.00  | 0.00  | 1.46      |

| Primary information category | Secondary information category                           | Not useful at all |         |        |        |         |         |         |           | Not very useful |         |         |         |         |         |         |           |
|------------------------------|----------------------------------------------------------|-------------------|---------|--------|--------|---------|---------|---------|-----------|-----------------|---------|---------|---------|---------|---------|---------|-----------|
|                              |                                                          | Phar              | Phys    | Nurs   | Sdtt   | Psyc    | Sht     | Nutr    | $\bar{X}$ | Phar            | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | $\bar{X}$ |
|                              | healthcare technologies                                  |                   |         |        |        |         |         |         |           |                 |         |         |         |         |         |         |           |
|                              | $\bar{X}$                                                | 3.38 %            | 0.99 %  | 1.21 % | 2.23 % | 3.57 %  | 2.86 %  | 0.00 %  | -         | 2.63 %          | 2.71 %  | 4.31 %  | 5.80 %  | 10.71 % | 0.95 %  | 11.43 % | -         |
| PUD_5                        | Access to emergency services                             | 5.26 %            | 1.72 %  | 7.55 % | 0.00 % | 0.00 %  | 0.00 %  | 0.00 %  | 2.08 %    | 2.63 %          | 3.45 %  | 4.72 %  | 12.50 % | 8.33 %  | 0.00 %  | 0.00 %  | 4.52 %    |
|                              | Access to appointments                                   | 5.26 %            | 1.72 %  | 0.94 % | 0.00 % | 0.00 %  | 0.00 %  | 0.00 %  | 1.13 %    | 2.63 %          | 3.45 %  | 0.94 %  | 9.38 %  | 0.00 %  | 0.00 %  | 0.00 %  | 2.34 %    |
|                              | Access to treatments                                     | 5.26 %            | 1.72 %  | 0.00 % | 0.00 % | 8.33 %  | 0.00 %  | 0.00 %  | 2.19 %    | 0.00 %          | 1.72 %  | 1.89 %  | 9.38 %  | 0.00 %  | 0.00 %  | 0.00 %  | 1.86 %    |
|                              | Access to surgeries                                      | 5.26 %            | 3.45 %  | 8.49 % | 0.00 % | 16.67 % | 0.00 %  | 0.00 %  | 4.84 %    | 2.63 %          | 3.45 %  | 3.77 %  | 6.25 %  | 0.00 %  | 0.00 %  | 0.00 %  | 2.30 %    |
|                              | $\bar{X}$                                                | 5.26 %            | 2.16 %  | 4.25 % | 0.00 % | 6.25 %  | 0.00 %  | 0.00 %  | -         | 1.97 %          | 3.02 %  | 2.83 %  | 9.38 %  | 2.08 %  | 0.00 %  | 0.00 %  | -         |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 5.26 %            | 10.34 % | 6.60 % | 3.13 % | 25.00 % | 13.33 % | 10.00 % | 10.52 %   | 10.53 %         | 15.52 % | 11.32 % | 18.75 % | 16.67 % | 13.33 % | 10.00 % | 13.73 %   |
|                              | Cost with medicines                                      | 5.26 %            | 8.62 %  | 5.66 % | 6.25 % | 25.00 % | 13.33 % | 10.00 % | 10.59 %   | 2.63 %          | 13.79 % | 13.21 % | 18.75 % | 16.67 % | 13.33 % | 10.00 % | 12.63 %   |
|                              | Cost with pharmaceutical products                        | 2.63 %            | 10.34 % | 5.66 % | 6.25 % | 25.00 % | 20.00 % | 10.00 % | 11.41 %   | 2.63 %          | 15.52 % | 14.15 % | 18.75 % | 16.67 % | 13.33 % | 10.00 % | 13.01 %   |
|                              | Cost with medical consumables                            | 5.26 %            | 15.52 % | 5.66 % | 6.25 % | 25.00 % | 13.33 % | 10.00 % | 11.57 %   | 5.26 %          | 13.79 % | 13.21 % | 18.75 % | 16.67 % | 13.33 % | 10.00 % | 13.00 %   |
|                              | Cost with laboratory consumables                         | 5.26 %            | 13.79 % | 6.60 % | 6.25 % | 25.00 % | 20.00 % | 10.00 % | 12.42 %   | 5.26 %          | 15.52 % | 15.09 % | 18.75 % | 16.67 % | 13.33 % | 10.00 % | 13.52 %   |
|                              | Cost with human resources                                | 5.26 %            | 17.24 % | 6.60 % | 3.13 % | 25.00 % | 20.00 % | 0.00 %  | 11.03 %   | 2.63 %          | 13.79 % | 15.09 % | 18.75 % | 16.67 % | 13.33 % | 20.00 % | 14.32 %   |
|                              | $\bar{X}$                                                | 4.82 %            | 12.64 % | 6.13 % | 5.21 % | 25.00 % | 16.67 % | 8.33 %  | -         | 4.82 %          | 14.66 % | 13.68 % | 18.75 % | 16.67 % | 13.33 % | 11.67 % | -         |
| PUD_7                        | Average time of appointment                              | 5.26 %            | 8.62 %  | 4.72 % | 3.13 % | 16.67 % | 6.67 %  | 0.00 %  | 6.44 %    | 13.16 %         | 13.79 % | 6.60 %  | 28.13 % | 0.00 %  | 13.33 % | 10.00 % | 12.14 %   |
|                              | Average time of treatment                                | 5.26 %            | 5.17 %  | 3.77 % | 3.13 % | 16.67 % | 6.67 %  | 10.00 % | 7.24 %    | 5.26 %          | 13.79 % | 7.55 %  | 21.88 % | 0.00 %  | 13.33 % | 10.00 % | 10.26 %   |
|                              | Average time of waiting                                  | 5.26 %            | 5.17 %  | 4.72 % | 6.25 % | 8.33 %  | 6.67 %  | 10.00 % | 6.63 %    | 13.16 %         | 6.90 %  | 6.60 %  | 18.75 % | 0.00 %  | 20.00 % | 0.00 %  | 9.34 %    |
|                              | Average time of management and administration            | 5.26 %            | 8.62 %  | 3.77 % | 6.25 % | 16.67 % | 6.67 %  | 20.00 % | 9.61 %    | 10.53 %         | 8.62 %  | 9.43 %  | 15.63 % | 0.00 %  | 20.00 % | 10.00 % | 10.60 %   |
|                              | $\bar{X}$                                                | 5.26 %            | 6.90 %  | 4.25 % | 4.69 % | 14.58 % | 6.67 %  | 10.00 % | -         | 10.53 %         | 10.78 % | 7.55 %  | 21.09 % | 0.00 %  | 16.67 % | 7.50 %  | -         |

Table 50. (continued)

| Primary information category | Secondary information category | Moderately useful |        |        |        |        |        |        |           |
|------------------------------|--------------------------------|-------------------|--------|--------|--------|--------|--------|--------|-----------|
|                              |                                | Phar              | Phys   | Nurs   | Sdtt   | Psyc   | Sht    | Nutr   | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances     | 5.26%             | 12.07% | 6.60%  | 3.13%  | 16.67% | 33.33% | 0.00%  | 11.01%    |
|                              | Demography                     | 21.05%            | 17.24% | 20.75% | 18.75% | 33.33% | 20.00% | 30.00% | 23.02%    |
|                              | Pregnancy                      | 5.26%             | 10.34% | 6.60%  | 9.38%  | 16.67% | 26.67% | 0.00%  | 10.70%    |
|                              | Habits                         | 15.79%            | 15.52% | 8.49%  | 3.13%  | 16.67% | 26.67% | 10.00% | 13.75%    |
|                              | Clinical and family history    | 7.89%             | 6.90%  | 8.49%  | 6.25%  | 0.00%  | 26.67% | 0.00%  | 8.03%     |
|                              | Identification                 | 18.42%            | 1.72%  | 6.60%  | 3.13%  | 0.00%  | 26.67% | 0.00%  | 8.08%     |
|                              | Death                          | 18.42%            | 6.90%  | 13.21% | 12.50% | 16.67% | 33.33% | 0.00%  | 14.43%    |
|                              | Pathologies                    | 7.89%             | 3.45%  | 7.55%  | 3.13%  | 16.67% | 20.00% | 0.00%  | 8.38%     |
|                              | $\bar{X}$                      | 12.50%            | 9.27%  | 9.79%  | 7.42%  | 14.58% | 26.67% | 5.00%  | -         |
| PUD_2                        | Anthropometric evaluation      | 15.79%            | 10.34% | 15.09% | 3.13%  | 33.33% | 20.00% | 0.00%  | 13.96%    |
|                              | Laboratory tests               | 10.53%            | 3.45%  | 10.38% | 12.50% | 33.33% | 13.33% | 0.00%  | 11.93%    |

| Primary information category | Secondary information category                           | Moderately useful |        |        |        |        |        |        |           |
|------------------------------|----------------------------------------------------------|-------------------|--------|--------|--------|--------|--------|--------|-----------|
|                              |                                                          | Phar              | Phys   | Nurs   | Sdt    | Psyc   | Sht    | Nutr   | $\bar{X}$ |
|                              | Imaging exams                                            | 10.53%            | 3.45%  | 11.32% | 6.25%  | 25.00% | 20.00% | 30.00% | 15.22%    |
|                              | Rapid tests                                              | 15.79%            | 10.34% | 16.04% | 15.63% | 33.33% | 20.00% | 20.00% | 18.73%    |
|                              | Physical exams                                           | 10.53%            | 13.79% | 13.21% | 12.50% | 25.00% | 13.33% | 20.00% | 15.48%    |
|                              | Electrocardiogram                                        | 15.79%            | 6.90%  | 17.92% | 6.25%  | 8.33%  | 20.00% | 30.00% | 15.03%    |
|                              | Vital parameters                                         | 18.42%            | 10.34% | 9.43%  | 12.50% | 25.00% | 33.33% | 10.00% | 17.00%    |
|                              | $\bar{X}$                                                | 13.91%            | 8.37%  | 13.34% | 9.82%  | 26.19% | 20.00% | 15.71% | -         |
|                              |                                                          |                   |        |        |        |        |        |        |           |
| PUD_3                        | Vaccination and immunization                             | 13.16%            | 10.34% | 5.66%  | 12.50% | 33.33% | 13.33% | 10.00% | 14.05%    |
|                              | Screenings                                               | 10.53%            | 6.90%  | 11.32% | 15.63% | 25.00% | 6.67%  | 10.00% | 12.29%    |
|                              | Diet                                                     | 10.53%            | 15.52% | 13.21% | 18.75% | 16.67% | 13.33% | 0.00%  | 12.57%    |
|                              | Physical activity                                        | 15.79%            | 17.24% | 14.15% | 21.88% | 8.33%  | 13.33% | 0.00%  | 12.96%    |
|                              | Antimicrobial resistance                                 | 7.89%             | 13.79% | 8.49%  | 21.88% | 41.67% | 13.33% | 10.00% | 16.72%    |
|                              | Smoking                                                  | 10.53%            | 6.90%  | 13.21% | 12.50% | 33.33% | 20.00% | 0.00%  | 13.78%    |
|                              | Epidemiology                                             | 10.53%            | 10.34% | 9.43%  | 15.63% | 16.67% | 20.00% | 20.00% | 14.66%    |
|                              | $\bar{X}$                                                | 11.28%            | 11.58% | 10.78% | 16.96% | 25.00% | 14.29% | 7.14%  | -         |
|                              |                                                          |                   |        |        |        |        |        |        |           |
| PUD_4                        | Medicines                                                | 7.89%             | 6.90%  | 4.72%  | 3.13%  | 8.33%  | 13.33% | 10.00% | 7.76%     |
|                              | Pharmaceutical products                                  | 7.89%             | 15.52% | 11.32% | 3.13%  | 8.33%  | 6.67%  | 10.00% | 8.98%     |
|                              | Medical consumables                                      | 23.68%            | 18.97% | 15.09% | 28.13% | 16.67% | 20.00% | 20.00% | 20.36%    |
|                              | Laboratory consumables                                   | 23.68%            | 22.41% | 12.26% | 18.75% | 41.67% | 13.33% | 20.00% | 21.73%    |
|                              | Drug interactions                                        | 5.26%             | 8.62%  | 5.66%  | 12.50% | 16.67% | 6.67%  | 10.00% | 9.34%     |
|                              | Dosage                                                   | 7.89%             | 8.62%  | 6.60%  | 6.25%  | 25.00% | 20.00% | 30.00% | 14.91%    |
|                              | Technical information about healthcare technologies      | 13.16%            | 13.79% | 12.26% | 3.13%  | 16.67% | 26.67% | 20.00% | 15.10%    |
|                              | $\bar{X}$                                                | 12.78%            | 13.55% | 9.70%  | 10.71% | 19.05% | 15.24% | 17.14% | -         |
|                              |                                                          |                   |        |        |        |        |        |        |           |
| PUD_5                        | Access to emergency services                             | 10.53%            | 10.34% | 9.43%  | 12.50% | 16.67% | 6.67%  | 30.00% | 13.73%    |
|                              | Access to appointments                                   | 10.53%            | 13.79% | 13.21% | 12.50% | 16.67% | 13.33% | 20.00% | 14.29%    |
|                              | Access to treatments                                     | 10.53%            | 10.34% | 11.32% | 12.50% | 16.67% | 6.67%  | 40.00% | 15.43%    |
|                              | Access to surgeries                                      | 10.53%            | 13.79% | 10.38% | 12.50% | 25.00% | 6.67%  | 40.00% | 16.98%    |
|                              | $\bar{X}$                                                | 10.53%            | 12.07% | 11.08% | 12.50% | 18.75% | 8.33%  | 32.50% | -         |
|                              |                                                          |                   |        |        |        |        |        |        |           |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 15.79%            | 20.69% | 20.75% | 18.75% | 16.67% | 26.67% | 40.00% | 22.76%    |
|                              | Cost with medicines                                      | 13.16%            | 18.97% | 16.98% | 12.50% | 16.67% | 20.00% | 40.00% | 19.75%    |
|                              | Cost with pharmaceutical products                        | 18.42%            | 20.69% | 18.87% | 12.50% | 16.67% | 13.33% | 40.00% | 20.07%    |
|                              | Cost with medical consumables                            | 23.68%            | 22.41% | 18.87% | 15.63% | 16.67% | 20.00% | 40.00% | 22.47%    |
|                              | Cost with laboratory consumables                         | 26.32%            | 22.41% | 20.75% | 21.88% | 16.67% | 13.33% | 40.00% | 23.05%    |
|                              | Cost with human resources                                | 28.95%            | 15.52% | 17.92% | 25.00% | 16.67% | 13.33% | 40.00% | 22.48%    |
|                              | $\bar{X}$                                                | 21.05%            | 20.11% | 19.03% | 17.71% | 16.67% | 17.78% | 40.00% | -         |
|                              |                                                          |                   |        |        |        |        |        |        |           |
| PUD_7                        | Average time of appointment                              | 23.68%            | 17.24% | 14.15% | 18.75% | 33.33% | 20.00% | 30.00% | 22.45%    |
|                              | Average time of treatment                                | 10.53%            | 17.24% | 13.21% | 25.00% | 33.33% | 13.33% | 40.00% | 21.81%    |
|                              | Average time of waiting                                  | 13.16%            | 24.14% | 13.21% | 31.25% | 16.67% | 13.33% | 40.00% | 21.68%    |
|                              | Average time of management and administration            | 15.79%            | 24.14% | 16.04% | 37.50% | 33.33% | 20.00% | 30.00% | 25.26%    |
|                              | $\bar{X}$                                                | 15.79%            | 20.69% | 14.15% | 28.13% | 29.17% | 16.67% | 35.00% | -         |

Table 50. (continued)

| Primary information category | Secondary information category                      | Useful  |         |         |         |         |         |         |           | Very useful |         |         |         |         |         |         |           |
|------------------------------|-----------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|-----------|-------------|---------|---------|---------|---------|---------|---------|-----------|
|                              |                                                     | Phar    | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | $\bar{X}$ | Phar        | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances                          | 23.68 % | 18.97 % | 17.92 % | 18.75 % | 16.67 % | 13.33 % | 20.00 % | 18.47 %   | 63.16 %     | 65.52 % | 67.92 % | 68.75 % | 25.00 % | 46.67 % | 80.00 % | 59.57 %   |
|                              | Demography                                          | 42.11 % | 41.38 % | 38.68 % | 50.00 % | 33.33 % | 33.33 % | 30.00 % | 38.40 %   | 26.32 %     | 29.31 % | 25.47 % | 18.75 % | 8.33 %  | 13.33 % | 40.00 % | 23.07 %   |
|                              | Pregnancy                                           | 31.58 % | 39.66 % | 35.85 % | 15.63 % | 66.67 % | 13.33 % | 40.00 % | 34.67 %   | 55.26 %     | 48.28 % | 51.89 % | 65.63 % | 16.67 % | 53.33 % | 60.00 % | 50.15 %   |
|                              | Habits                                              | 44.74 % | 44.83 % | 36.79 % | 37.50 % | 16.67 % | 33.33 % | 20.00 % | 33.41 %   | 34.21 %     | 36.21 % | 48.11 % | 46.88 % | 58.33 % | 33.33 % | 70.00 % | 46.72 %   |
|                              | Clinical and family history                         | 21.05 % | 41.38 % | 28.30 % | 21.88 % | 33.33 % | 13.33 % | 50.00 % | 29.90 %   | 63.16 %     | 44.83 % | 60.38 % | 65.63 % | 58.33 % | 60.00 % | 50.00 % | 57.47 %   |
|                              | Identification                                      | 31.58 % | 39.66 % | 26.42 % | 28.13 % | 58.33 % | 20.00 % | 30.00 % | 33.44 %   | 44.74 %     | 58.62 % | 66.98 % | 62.50 % | 41.67 % | 53.33 % | 70.00 % | 56.83 %   |
|                              | Death                                               | 34.21 % | 46.55 % | 29.25 % | 34.38 % | 50.00 % | 46.67 % | 70.00 % | 44.44 %   | 39.47 %     | 43.10 % | 47.17 % | 40.63 % | 16.67 % | 20.00 % | 30.00 % | 33.86 %   |
|                              | Pathologies                                         | 18.42 % | 27.59 % | 19.81 % | 12.50 % | 41.67 % | 13.33 % | 30.00 % | 23.33 %   | 68.42 %     | 67.24 % | 70.75 % | 78.13 % | 41.67 % | 66.67 % | 70.00 % | 66.13 %   |
|                              | $\bar{X}$                                           | 30.92 % | 37.50 % | 29.13 % | 27.34 % | 39.58 % | 23.33 % | 36.25 % | -         | 49.34 %     | 49.14 % | 54.83 % | 55.86 % | 33.33 % | 43.33 % | 58.75 % | -         |
| PUD_2                        | Anthropometric evaluation                           | 60.53 % | 32.76 % | 35.85 % | 40.63 % | 33.33 % | 33.33 % | 50.00 % | 40.92 %   | 13.16 %     | 39.66 % | 44.34 % | 43.75 % | 16.67 % | 33.33 % | 50.00 % | 34.41 %   |
|                              | Laboratory tests                                    | 26.32 % | 29.31 % | 27.36 % | 15.63 % | 33.33 % | 26.67 % | 20.00 % | 25.52 %   | 55.26 %     | 65.52 % | 60.38 % | 68.75 % | 25.00 % | 60.00 % | 80.00 % | 59.27 %   |
|                              | Imaging exams                                       | 42.11 % | 24.14 % | 27.36 % | 18.75 % | 33.33 % | 26.67 % | 20.00 % | 27.48 %   | 34.21 %     | 70.69 % | 52.83 % | 75.00 % | 16.67 % | 53.33 % | 40.00 % | 48.96 %   |
|                              | Rapid tests                                         | 42.11 % | 44.83 % | 30.19 % | 34.38 % | 33.33 % | 40.00 % | 30.00 % | 36.40 %   | 34.21 %     | 41.38 % | 48.11 % | 43.75 % | 25.00 % | 40.00 % | 30.00 % | 37.49 %   |
|                              | Physical exams                                      | 50.00 % | 31.03 % | 31.13 % | 31.25 % | 50.00 % | 33.33 % | 30.00 % | 36.68 %   | 26.32 %     | 50.00 % | 50.94 % | 46.88 % | 16.67 % | 40.00 % | 50.00 % | 40.11 %   |
|                              | Electrocardiogram                                   | 34.21 % | 31.03 % | 32.08 % | 28.13 % | 50.00 % | 20.00 % | 30.00 % | 32.21 %   | 34.21 %     | 58.62 % | 43.40 % | 53.13 % | 16.67 % | 40.00 % | 30.00 % | 39.43 %   |
|                              | Vital parameters                                    | 42.11 % | 34.48 % | 28.30 % | 28.13 % | 50.00 % | 20.00 % | 50.00 % | 36.14 %   | 31.58 %     | 50.00 % | 59.43 % | 53.13 % | 16.67 % | 46.67 % | 40.00 % | 42.50 %   |
|                              | $\bar{X}$                                           | 42.48 % | 32.51 % | 30.32 % | 28.13 % | 40.48 % | 28.57 % | 32.86 % | -         | 32.71 %     | 53.69 % | 51.35 % | 54.91 % | 19.05 % | 44.76 % | 45.71 % | -         |
| PUD_3                        | Vaccination and immunization                        | 31.58 % | 31.03 % | 29.25 % | 31.25 % | 50.00 % | 33.33 % | 40.00 % | 35.21 %   | 50.00 %     | 56.90 % | 62.26 % | 40.63 % | 16.67 % | 46.67 % | 30.00 % | 43.30 %   |
|                              | Screenings                                          | 39.47 % | 25.86 % | 39.62 % | 46.88 % | 41.67 % | 33.33 % | 50.00 % | 39.55 %   | 42.11 %     | 60.34 % | 46.23 % | 25.00 % | 25.00 % | 60.00 % | 30.00 % | 41.24 %   |
|                              | Diet                                                | 52.63 % | 31.03 % | 41.51 % | 46.88 % | 58.33 % | 26.67 % | 40.00 % | 42.44 %   | 28.95 %     | 43.10 % | 39.62 % | 28.13 % | 16.67 % | 46.67 % | 60.00 % | 37.59 %   |
|                              | Physical activity                                   | 44.74 % | 31.03 % | 41.51 % | 46.88 % | 58.33 % | 26.67 % | 60.00 % | 44.17 %   | 28.95 %     | 41.38 % | 34.91 % | 25.00 % | 16.67 % | 40.00 % | 40.00 % | 32.41 %   |
|                              | Antimicrobial resistance                            | 28.95 % | 20.69 % | 25.47 % | 21.88 % | 25.00 % | 33.33 % | 40.00 % | 27.90 %   | 57.89 %     | 56.90 % | 58.49 % | 43.75 % | 16.67 % | 53.33 % | 30.00 % | 45.29 %   |
|                              | Smoking                                             | 34.21 % | 29.31 % | 35.85 % | 34.38 % | 41.67 % | 33.33 % | 70.00 % | 39.82 %   | 47.37 %     | 55.17 % | 46.23 % | 46.88 % | 16.67 % | 40.00 % | 30.00 % | 40.33 %   |
|                              | Epidemiology                                        | 39.47 % | 39.66 % | 39.62 % | 37.50 % | 50.00 % | 26.67 % | 50.00 % | 40.42 %   | 44.74 %     | 39.66 % | 43.40 % | 40.63 % | 16.67 % | 46.67 % | 30.00 % | 37.39 %   |
|                              | $\bar{X}$                                           | 38.72 % | 29.80 % | 36.12 % | 37.95 % | 46.43 % | 30.48 % | 50.00 % | -         | 42.86 %     | 50.49 % | 47.30 % | 35.71 % | 17.86 % | 47.62 % | 35.71 % | -         |
| PUD_4                        | Medicines                                           | 18.42 % | 25.86 % | 24.53 % | 31.25 % | 41.67 % | 33.33 % | 40.00 % | 30.72 %   | 71.05 %     | 67.24 % | 68.87 % | 62.50 % | 41.67 % | 53.33 % | 50.00 % | 59.24 %   |
|                              | Pharmaceutical products                             | 21.05 % | 34.48 % | 38.68 % | 50.00 % | 41.67 % | 33.33 % | 40.00 % | 37.03 %   | 68.42 %     | 48.28 % | 45.28 % | 37.50 % | 41.67 % | 53.33 % | 50.00 % | 49.21 %   |
|                              | Medical consumables                                 | 44.74 % | 36.21 % | 41.51 % | 34.38 % | 25.00 % | 33.33 % | 30.00 % | 35.02 %   | 26.32 %     | 39.66 % | 37.74 % | 28.13 % | 33.33 % | 46.67 % | 20.00 % | 33.12 %   |
|                              | Laboratory consumables                              | 39.47 % | 36.21 % | 42.45 % | 43.75 % | 25.00 % | 40.00 % | 30.00 % | 36.70 %   | 26.32 %     | 36.21 % | 34.91 % | 21.88 % | 16.67 % | 46.67 % | 20.00 % | 28.95 %   |
|                              | Drug interactions                                   | 21.05 % | 27.59 % | 23.58 % | 31.25 % | 33.33 % | 26.67 % | 50.00 % | 30.50 %   | 65.79 %     | 60.34 % | 65.09 % | 50.00 % | 41.67 % | 60.00 % | 30.00 % | 53.27 %   |
|                              | Dosage                                              | 23.68 % | 25.86 % | 28.30 % | 31.25 % | 33.33 % | 13.33 % | 40.00 % | 27.97 %   | 65.79 %     | 62.07 % | 62.26 % | 53.13 % | 25.00 % | 53.33 % | 30.00 % | 50.23 %   |
|                              | Technical information about healthcare technologies | 28.95 % | 34.48 % | 35.85 % | 34.38 % | 50.00 % | 33.33 % | 40.00 % | 36.71 %   | 47.37 %     | 44.83 % | 44.34 % | 59.38 % | 16.67 % | 40.00 % | 30.00 % | 40.37 %   |
|                              | $\bar{X}$                                           | 28.20 % | 31.53 % | 33.56 % | 36.61 % | 35.71 % | 30.48 % | 38.57 % | -         | 53.01 %     | 51.23 % | 51.21 % | 44.64 % | 30.95 % | 50.48 % | 32.86 % | -         |
| PUD_5                        | Access to emergency services                        | 39.47 % | 32.76 % | 28.30 % | 37.50 % | 41.67 % | 33.33 % | 40.00 % | 36.15 %   | 42.11 %     | 51.72 % | 50.00 % | 37.50 % | 33.33 % | 60.00 % | 30.00 % | 43.52 %   |
|                              | Access to appointments                              | 36.84 % | 29.31 % | 33.96 % | 40.63 % | 50.00 % | 46.67 % | 50.00 % | 41.06 %   | 44.74 %     | 51.72 % | 50.94 % | 37.50 % | 33.33 % | 40.00 % | 30.00 % | 41.18 %   |
|                              | Access to treatments                                | 36.84 % | 32.76 % | 34.91 % | 40.63 % | 41.67 % | 53.33 % | 30.00 % | 38.59 %   | 47.37 %     | 53.45 % | 51.89 % | 37.50 % | 33.33 % | 40.00 % | 30.00 % | 41.93 %   |
|                              | Access to surgeries                                 | 39.47 % | 29.31 % | 33.02 % | 40.63 % | 33.33 % | 33.33 % | 30.00 % | 34.16 %   | 42.11 %     | 50.00 % | 44.34 % | 40.63 % | 25.00 % | 60.00 % | 30.00 % | 41.72 %   |
|                              | $\bar{X}$                                           | 38.41 % | 31.53 % | 33.75 % | 40.63 % | 43.57 % | 41.67 % | 38.00 % | 39.87 %   | 44.07 %     | 51.40 % | 50.74 % | 38.13 % | 33.33 % | 40.00 % | 30.00 % | 41.61 %   |

| Primary information category | Secondary information category                           | Useful     |            |            |            |            |            |            |            | Very useful |            |            |            |            |            |            |            |
|------------------------------|----------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|------------|------------|------------|------------|
|                              |                                                          | Phar       | Phys       | Nurs       | Sdt        | Psyc       | Sht        | Nutr       | X          | Phar        | Phys       | Nurs       | Sdt        | Psyc       | Sht        | Nutr       | X          |
|                              | $\bar{X}$                                                | 38.16<br>% | 31.03<br>% | 32.55<br>% | 39.84<br>% | 41.67<br>% | 41.67<br>% | 37.50<br>% | -          | 44.08<br>%  | 51.72<br>% | 49.29<br>% | 38.28<br>% | 31.25<br>% | 50.00<br>% | 30.00<br>% | -          |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 42.11<br>% | 17.24<br>% | 31.13<br>% | 28.13<br>% | 25.00<br>% | 20.00<br>% | 20.00<br>% | 26.23<br>% | 26.32<br>%  | 36.21<br>% | 30.19<br>% | 31.25<br>% | 16.67<br>% | 26.67<br>% | 20.00<br>% | 26.76<br>% |
|                              | Cost with medicines                                      | 39.47<br>% | 22.41<br>% | 35.85<br>% | 37.50<br>% | 25.00<br>% | 33.33<br>% | 20.00<br>% | 30.51<br>% | 39.47<br>%  | 36.21<br>% | 28.30<br>% | 25.00<br>% | 16.67<br>% | 20.00<br>% | 20.00<br>% | 26.52<br>% |
|                              | Cost with pharmaceutical products                        | 39.47<br>% | 20.69<br>% | 32.08<br>% | 37.50<br>% | 25.00<br>% | 33.33<br>% | 20.00<br>% | 29.72<br>% | 36.84<br>%  | 32.76<br>% | 29.25<br>% | 25.00<br>% | 16.67<br>% | 20.00<br>% | 20.00<br>% | 25.79<br>% |
|                              | Cost with medical consumables                            | 36.84<br>% | 24.14<br>% | 33.96<br>% | 37.50<br>% | 25.00<br>% | 26.67<br>% | 20.00<br>% | 29.16<br>% | 28.95<br>%  | 24.14<br>% | 28.30<br>% | 21.88<br>% | 16.67<br>% | 26.67<br>% | 20.00<br>% | 23.80<br>% |
|                              | Cost with laboratory consumables                         | 36.84<br>% | 25.86<br>% | 30.19<br>% | 31.25<br>% | 25.00<br>% | 26.67<br>% | 20.00<br>% | 27.97<br>% | 26.32<br>%  | 22.41<br>% | 27.36<br>% | 21.88<br>% | 16.67<br>% | 26.67<br>% | 20.00<br>% | 23.04<br>% |
|                              | Cost with human resources                                | 36.84<br>% | 25.86<br>% | 30.19<br>% | 28.13<br>% | 25.00<br>% | 26.67<br>% | 20.00<br>% | 27.53<br>% | 26.32<br>%  | 27.59<br>% | 30.19<br>% | 25.00<br>% | 16.67<br>% | 26.67<br>% | 20.00<br>% | 24.63<br>% |
|                              | $\bar{X}$                                                | 38.60<br>% | 22.70<br>% | 32.23<br>% | 33.33<br>% | 25.00<br>% | 27.78<br>% | 20.00<br>% | -          | 30.70<br>%  | 29.89<br>% | 28.93<br>% | 25.00<br>% | 16.67<br>% | 24.44<br>% | 20.00<br>% | -          |
| PUD_7                        | Average time of appointment                              | 39.47<br>% | 34.48<br>% | 45.28<br>% | 28.13<br>% | 33.33<br>% | 40.00<br>% | 20.00<br>% | 34.39<br>% | 18.42<br>%  | 25.86<br>% | 29.25<br>% | 21.88<br>% | 16.67<br>% | 20.00<br>% | 40.00<br>% | 24.58<br>% |
|                              | Average time of treatment                                | 52.63<br>% | 44.83<br>% | 46.23<br>% | 28.13<br>% | 33.33<br>% | 46.67<br>% | 20.00<br>% | 38.83<br>% | 26.32<br>%  | 18.97<br>% | 29.25<br>% | 21.88<br>% | 16.67<br>% | 20.00<br>% | 20.00<br>% | 21.87<br>% |
|                              | Average time of waiting                                  | 44.74<br>% | 39.66<br>% | 46.23<br>% | 21.88<br>% | 50.00<br>% | 33.33<br>% | 10.00<br>% | 35.12<br>% | 23.68<br>%  | 24.14<br>% | 29.25<br>% | 21.88<br>% | 25.00<br>% | 26.67<br>% | 40.00<br>% | 27.23<br>% |
|                              | Average time of management and administration            | 44.74<br>% | 34.48<br>% | 45.28<br>% | 25.00<br>% | 33.33<br>% | 33.33<br>% | 20.00<br>% | 33.74<br>% | 23.68<br>%  | 24.14<br>% | 25.47<br>% | 15.63<br>% | 16.67<br>% | 20.00<br>% | 20.00<br>% | 20.80<br>% |
|                              | $\bar{X}$                                                | 45.39<br>% | 38.36<br>% | 45.75<br>% | 25.78<br>% | 37.50<br>% | 38.33<br>% | 17.50<br>% | -          | 23.03<br>%  | 23.28<br>% | 28.30<br>% | 20.31<br>% | 18.75<br>% | 21.67<br>% | 30.00<br>% | -          |

## Annex XIX – Patients' perspectives by age group about healthcare data utility: standard deviation

Table 51. Patients' perspectives by age group about healthcare data utility: standard deviation

| Primary information category | Secondary information category | Standard deviation |         |         |         |         |         |           | $\bar{X}$ |
|------------------------------|--------------------------------|--------------------|---------|---------|---------|---------|---------|-----------|-----------|
|                              |                                | $\leq 18$          | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | $\geq 65$ |           |
| PUD_1 <sup>a)</sup>          | Allergies and intolerances     | 0.58               | 0.90    | 0.93    | 1.20    | 1.16    | 1.24    | 1.20      | 1.03      |
|                              | Demography                     | 0.58               | 1.07    | 1.12    | 1.16    | 1.21    | 1.22    | 1.18      | 1.07      |
|                              | Pregnancy                      | 0.58               | 1.15    | 0.98    | 1.21    | 1.26    | 1.22    | 1.32      | 1.10      |
|                              | Habits                         | 0.58               | 0.73    | 0.98    | 1.12    | 1.20    | 1.14    | 1.09      | 0.98      |
|                              | Clinical and family history    | 0.58               | 0.94    | 0.80    | 1.07    | 1.24    | 1.19    | 1.11      | 0.99      |
|                              | Identification                 | 0.58               | 1.11    | 1.01    | 1.08    | 1.06    | 1.13    | 1.07      | 1.00      |
|                              | Death                          | 0.58               | 1.12    | 1.11    | 1.17    | 1.30    | 1.17    | 1.03      | 1.07      |
|                              | Pathologies                    | 0.58               | 0.91    | 0.80    | 1.15    | 1.13    | 1.22    | 1.23      | 1.00      |
|                              | $\bar{X}$                      | 0.58               | 0.99    | 0.97    | 1.14    | 1.19    | 1.19    | 1.15      | -         |
| PUD_2 <sup>a)</sup>          | Anthropometric evaluation      | 0.58               | 0.76    | 1.11    | 1.13    | 1.19    | 1.22    | 1.16      | 1.02      |
|                              | Laboratory tests               | 0.58               | 0.81    | 0.87    | 1.14    | 1.15    | 1.21    | 1.13      | 0.98      |
|                              | Imaging exams                  | 0.58               | 1.00    | 0.97    | 1.15    | 1.17    | 1.23    | 1.18      | 1.04      |
|                              | Rapid tests                    | 0.58               | 0.94    | 0.98    | 1.14    | 1.17    | 1.17    | 1.27      | 1.04      |
|                              | Physical exams                 | 0.58               | 0.74    | 1.12    | 1.16    | 1.20    | 1.25    | 1.29      | 1.05      |
|                              | Electrocardiogram              | 0.58               | 0.91    | 0.82    | 1.15    | 1.21    | 1.30    | 1.36      | 1.05      |
|                              | Vital parameters               | 0.58               | 0.78    | 0.97    | 1.15    | 1.18    | 1.32    | 1.34      | 1.05      |
|                              | $\bar{X}$                      | 0.58               | 0.85    | 0.98    | 1.15    | 1.18    | 1.24    | 1.25      | -         |
| PUD_3 <sup>a)</sup>          | Vaccination and immunization   | 0.58               | 0.88    | 0.78    | 1.16    | 1.20    | 1.18    | 1.17      | 0.99      |
|                              | Screenings                     | 0.58               | 0.81    | 0.81    | 1.16    | 1.22    | 1.07    | 1.17      | 0.98      |
|                              | Diet                           | 0.58               | 0.91    | 1.00    | 1.14    | 1.17    | 1.15    | 1.12      | 1.01      |
|                              | Physical activity              | 0.58               | 0.91    | 1.06    | 1.16    | 1.17    | 1.11    | 1.33      | 1.05      |
|                              | Antimicrobial resistance       | 0.58               | 0.82    | 0.99    | 1.15    | 1.22    | 1.13    | 1.36      | 1.04      |
|                              | Smoking                        | 1.00               | 0.88    | 1.10    | 1.13    | 1.26    | 1.20    | 1.46      | 1.15      |
|                              | Epidemiology                   | 0.58               | 0.78    | 0.88    | 1.16    | 1.21    | 1.09    | 1.32      | 1.00      |
|                              | $\bar{X}$                      | 0.64               | 0.86    | 0.95    | 1.15    | 1.21    | 1.13    | 1.28      | -         |
| PUD_4 <sup>a)</sup>          | Medicines                      | 0.58               | 0.76    | 0.78    | 1.04    | 1.14    | 1.13    | 1.19      | 0.95      |
|                              | Pharmaceutical products        | 0.58               | 0.94    | 0.92    | 1.11    | 1.16    | 1.20    | 1.24      | 1.02      |
|                              | Medical consumables            | 0.58               | 0.97    | 1.08    | 1.18    | 1.27    | 1.21    | 1.27      | 1.08      |
|                              | Laboratory consumables         | 0.58               | 0.96    | 1.11    | 1.19    | 1.24    | 1.24    | 1.27      | 1.08      |
|                              | Drug interactions              | 0.58               | 0.74    | 0.94    | 1.19    | 1.15    | 1.30    | 1.32      | 1.03      |
|                              | Dosage                         | 0.58               | 0.82    | 0.96    | 1.17    | 1.20    | 1.29    | 1.33      | 1.05      |

| Primary information category | Secondary information category                           | Standard deviation |         |         |         |         |         |           | $\bar{X}$ |
|------------------------------|----------------------------------------------------------|--------------------|---------|---------|---------|---------|---------|-----------|-----------|
|                              |                                                          | $\leq 18$          | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | $\geq 65$ |           |
|                              | Technical information about healthcare technologies      | 0.58               | 0.75    | 1.03    | 1.18    | 1.22    | 1.22    | 1.26      | 1.03      |
|                              | $\bar{X}$                                                | 0.58               | 0.85    | 0.97    | 1.15    | 1.20    | 1.23    | 1.27      | -         |
| PUD_5 <sup>a)</sup>          | Access to emergency services                             | 0.58               | 0.88    | 0.97    | 1.18    | 1.27    | 1.37    | 1.19      | 1.06      |
|                              | Access to appointments                                   | 0.58               | 0.81    | 0.98    | 1.14    | 1.25    | 1.35    | 1.20      | 1.04      |
|                              | Access to treatments                                     | 0.58               | 0.91    | 0.89    | 1.18    | 1.22    | 1.29    | 1.20      | 1.04      |
|                              | Access to surgeries                                      | 0.58               | 0.90    | 1.13    | 1.22    | 1.27    | 1.33    | 1.26      | 1.10      |
|                              | $\bar{X}$                                                | 0.58               | 0.87    | 0.99    | 1.18    | 1.25    | 1.34    | 1.21      | -         |
| PUD_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 0.58               | 1.07    | 1.07    | 1.22    | 1.29    | 1.28    | 1.31      | 1.12      |
|                              | Cost with medicines                                      | 0.58               | 0.96    | 1.09    | 1.20    | 1.30    | 1.32    | 1.39      | 1.12      |
|                              | Cost with pharmaceutical products                        | 0.58               | 0.93    | 1.06    | 1.18    | 1.30    | 1.32    | 1.39      | 1.11      |
|                              | Cost with medical consumables                            | 0.58               | 0.92    | 1.09    | 1.22    | 1.31    | 1.32    | 1.32      | 1.11      |
|                              | Cost with laboratory consumables                         | 0.58               | 1.00    | 1.16    | 1.23    | 1.31    | 1.36    | 1.32      | 1.14      |
|                              | Cost with human resources                                | 0.58               | 1.01    | 1.11    | 1.22    | 1.29    | 1.32    | 1.33      | 1.12      |
|                              | $\bar{X}$                                                | 0.58               | 0.98    | 1.10    | 1.21    | 1.30    | 1.32    | 1.35      | -         |
| PUD_7 <sup>a)</sup>          | Average time of appointment                              | 0.58               | 1.02    | 1.03    | 1.27    | 1.29    | 1.29    | 1.32      | 1.11      |
|                              | Average time of treatment                                | 0.58               | 0.96    | 1.10    | 1.21    | 1.28    | 1.29    | 1.20      | 1.09      |
|                              | Average time of waiting                                  | 0.58               | 1.28    | 1.25    | 1.29    | 1.35    | 1.36    | 1.42      | 1.22      |
|                              | Average time of management and administration            | 0.58               | 1.33    | 1.16    | 1.23    | 1.33    | 1.34    | 1.32      | 1.18      |
|                              | $\bar{X}$                                                | 0.58               | 1.15    | 1.13    | 1.25    | 1.31    | 1.32    | 1.32      | -         |

a) 5-Likert utility scale: 1 - Not useful at all; 2 - Not very useful; 3 - Moderately useful; 4 - Useful; 5 - Very useful

## Annex XX – Patients' perspectives by age group about healthcare data: utility analysis (%)

Table 52. Patients' perspectives by age group about healthcare data: utility analysis (%)

| Primary information category | Secondary information category                      | Not useful at all |         |         |         |         |         |         |        | Not very useful |         |         |         |         |         |         |         |
|------------------------------|-----------------------------------------------------|-------------------|---------|---------|---------|---------|---------|---------|--------|-----------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                     | ≤ 18              | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | Σ      | ≤ 18            | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | Σ       |
| PUD_1                        | Allergies and intolerances                          | 0.00 %            | 0.00 %  | 0.00 %  | 7.14 %  | 5.41 %  | 8.45 %  | 9.09 %  | 4.30 % | 0.00 %          | 5.26 %  | 7.69 %  | 5.56 %  | 8.11 %  | 8.45 %  | 6.06 %  | 5.88 %  |
|                              | Demography                                          | 0.00 %            | 0.00 %  | 3.85 %  | 6.35 %  | 8.11 %  | 9.86 %  | 15.15 % | 6.19 % | 0.00 %          | 36.84 % | 9.62 %  | 10.32 % | 18.02 % | 18.31 % | 12.12 % | 15.03 % |
|                              | Pregnancy                                           | 0.00 %            | 5.26 %  | 1.92 %  | 8.73 %  | 8.11 %  | 8.45 %  | 12.12 % | 6.37 % | 0.00 %          | 10.53 % | 5.77 %  | 3.17 %  | 9.01 %  | 8.45 %  | 9.09 %  | 6.57 %  |
|                              | Habits                                              | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 7.21 %  | 5.63 %  | 9.09 %  | 4.31 % | 0.00 %          | 0.00 %  | 5.77 %  | 5.56 %  | 11.71 % | 14.08 % | 9.09 %  | 6.60 %  |
|                              | Clinical and family history                         | 0.00 %            | 0.00 %  | 0.00 %  | 4.76 %  | 8.11 %  | 5.63 %  | 6.06 %  | 3.51 % | 0.00 %          | 10.53 % | 1.92 %  | 3.97 %  | 5.41 %  | 8.45 %  | 6.06 %  | 5.19 %  |
|                              | Identification                                      | 0.00 %            | 5.26 %  | 1.92 %  | 4.76 %  | 4.50 %  | 5.63 %  | 6.06 %  | 4.02 % | 0.00 %          | 5.26 %  | 5.77 %  | 4.76 %  | 5.41 %  | 9.86 %  | 6.06 %  | 5.30 %  |
|                              | Death                                               | 0.00 %            | 0.00 %  | 1.92 %  | 7.94 %  | 9.91 %  | 7.04 %  | 6.06 %  | 4.70 % | 0.00 %          | 26.32 % | 11.54 % | 3.97 %  | 10.81 % | 12.68 % | 9.09 %  | 10.63 % |
|                              | Pathologies                                         | 0.00 %            | 0.00 %  | 0.00 %  | 6.35 %  | 4.50 %  | 7.04 %  | 9.09 %  | 3.86 % | 0.00 %          | 5.26 %  | 3.85 %  | 3.17 %  | 7.21 %  | 8.45 %  | 3.03 %  | 4.42 %  |
|                              | Σ                                                   | 0.00 %            | 1.32 %  | 1.44 %  | 6.55 %  | 6.98 %  | 7.22 %  | 9.09 %  | -      | 0.00 %          | 12.50 % | 6.49 %  | 5.06 %  | 9.46 %  | 11.09 % | 7.58 %  | -       |
|                              |                                                     |                   |         |         |         |         |         |         |        |                 |         |         |         |         |         |         |         |
| PUD_2                        | Anthropometric evaluation                           | 0.00 %            | 0.00 %  | 3.85 %  | 6.35 %  | 8.11 %  | 11.27 % | 12.12 % | 5.96 % | 0.00 %          | 0.00 %  | 9.62 %  | 6.35 %  | 9.91 %  | 5.63 %  | 12.12 % | 6.23 %  |
|                              | Laboratory tests                                    | 0.00 %            | 0.00 %  | 1.92 %  | 5.56 %  | 6.31 %  | 8.45 %  | 6.06 %  | 4.04 % | 0.00 %          | 5.26 %  | 0.00 %  | 5.56 %  | 4.50 %  | 4.23 %  | 6.06 %  | 3.66 %  |
|                              | Imaging exams                                       | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 6.31 %  | 8.45 %  | 6.06 %  | 4.16 % | 0.00 %          | 10.53 % | 3.85 %  | 3.97 %  | 5.41 %  | 4.23 %  | 9.09 %  | 5.29 %  |
|                              | Rapid tests                                         | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 6.31 %  | 8.45 %  | 9.09 %  | 4.59 % | 0.00 %          | 5.26 %  | 3.85 %  | 3.97 %  | 6.31 %  | 5.63 %  | 12.12 % | 5.31 %  |
|                              | Physical exams                                      | 0.00 %            | 0.00 %  | 5.77 %  | 6.35 %  | 7.21 %  | 9.86 %  | 9.09 %  | 5.47 % | 0.00 %          | 0.00 %  | 1.92 %  | 5.56 %  | 6.31 %  | 7.04 %  | 12.12 % | 4.71 %  |
|                              | Electrocardiogram                                   | 0.00 %            | 0.00 %  | 0.00 %  | 6.35 %  | 6.31 %  | 9.86 %  | 12.12 % | 4.95 % | 0.00 %          | 5.26 %  | 1.92 %  | 4.76 %  | 7.21 %  | 7.04 %  | 9.09 %  | 5.04 %  |
|                              | Vital parameters                                    | 0.00 %            | 0.00 %  | 3.85 %  | 6.35 %  | 6.31 %  | 11.27 % | 12.12 % | 5.70 % | 0.00 %          | 0.00 %  | 0.00 %  | 4.76 %  | 7.21 %  | 5.63 %  | 9.09 %  | 3.81 %  |
|                              | Σ                                                   | 0.00 %            | 0.00 %  | 2.75 %  | 6.24 %  | 6.69 %  | 9.66 %  | 9.52 %  | -      | 0.00 %          | 3.76 %  | 3.02 %  | 4.99 %  | 6.69 %  | 5.63 %  | 9.96 %  | -       |
|                              |                                                     |                   |         |         |         |         |         |         |        |                 |         |         |         |         |         |         |         |
|                              |                                                     |                   |         |         |         |         |         |         |        |                 |         |         |         |         |         |         |         |
| PUD_3                        | Vaccination and immunization                        | 0.00 %            | 0.00 %  | 0.00 %  | 5.56 %  | 8.11 %  | 5.63 %  | 6.06 %  | 3.62 % | 0.00 %          | 5.26 %  | 1.92 %  | 6.35 %  | 2.70 %  | 5.63 %  | 6.06 %  | 3.99 %  |
|                              | Screenings                                          | 0.00 %            | 0.00 %  | 0.00 %  | 5.56 %  | 9.01 %  | 2.82 %  | 6.06 %  | 3.35 % | 0.00 %          | 0.00 %  | 1.92 %  | 5.56 %  | 1.80 %  | 7.04 %  | 6.06 %  | 3.20 %  |
|                              | Diet                                                | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 8.11 %  | 5.63 %  | 6.06 %  | 4.01 % | 0.00 %          | 5.26 %  | 5.77 %  | 7.14 %  | 6.31 %  | 8.45 %  | 9.09 %  | 6.00 %  |
|                              | Physical activity                                   | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 7.21 %  | 5.63 %  | 12.12 % | 4.75 % | 0.00 %          | 5.26 %  | 7.69 %  | 7.14 %  | 9.01 %  | 5.63 %  | 12.12 % | 6.69 %  |
|                              | Antimicrobial resistance                            | 0.00 %            | 0.00 %  | 0.00 %  | 6.35 %  | 7.21 %  | 5.63 %  | 15.15 % | 4.91 % | 0.00 %          | 0.00 %  | 9.62 %  | 4.76 %  | 9.01 %  | 5.63 %  | 3.03 %  | 4.58 %  |
|                              | Smoking                                             | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 9.91 %  | 8.45 %  | 21.21 % | 6.84 % | 0.00 %          | 5.26 %  | 9.62 %  | 5.56 %  | 7.21 %  | 7.04 %  | 3.03 %  | 5.39 %  |
|                              | Epidemiology                                        | 0.00 %            | 0.00 %  | 0.00 %  | 7.14 %  | 8.11 %  | 4.23 %  | 15.15 % | 4.95 % | 0.00 %          | 0.00 %  | 3.85 %  | 3.17 %  | 4.50 %  | 7.04 %  | 3.03 %  | 3.09 %  |
|                              | Σ                                                   | 0.00 %            | 0.00 %  | 0.82 %  | 6.24 %  | 8.24 %  | 5.43 %  | 11.69 % | -      | 0.00 %          | 3.01 %  | 5.77 %  | 5.67 %  | 5.79 %  | 6.64 %  | 6.06 %  | -       |
| PUD_4                        | Medicines                                           | 0.00 %            | 0.00 %  | 0.00 %  | 3.17 %  | 4.50 %  | 4.23 %  | 6.06 %  | 2.57 % | 0.00 %          | 0.00 %  | 1.92 %  | 5.56 %  | 7.21 %  | 7.04 %  | 9.09 %  | 4.40 %  |
|                              | Pharmaceutical products                             | 0.00 %            | 0.00 %  | 0.00 %  | 4.76 %  | 5.41 %  | 7.04 %  | 9.09 %  | 3.76 % | 0.00 %          | 10.53 % | 5.77 %  | 6.35 %  | 7.21 %  | 7.04 %  | 6.06 %  | 6.14 %  |
|                              | Medical consumables                                 | 0.00 %            | 0.00 %  | 3.85 %  | 7.14 %  | 7.21 %  | 8.45 %  | 12.12 % | 5.54 % | 0.00 %          | 10.53 % | 7.69 %  | 6.35 %  | 14.41 % | 9.86 %  | 6.06 %  | 7.84 %  |
|                              | Laboratory consumables                              | 0.00 %            | 0.00 %  | 3.85 %  | 7.14 %  | 6.31 %  | 9.86 %  | 12.12 % | 5.61 % | 0.00 %          | 10.53 % | 9.62 %  | 6.35 %  | 14.41 % | 9.86 %  | 6.06 %  | 8.12 %  |
|                              | Drug interactions                                   | 0.00 %            | 0.00 %  | 1.92 %  | 7.14 %  | 5.41 %  | 9.86 %  | 12.12 % | 5.21 % | 0.00 %          | 0.00 %  | 3.85 %  | 4.76 %  | 7.21 %  | 7.04 %  | 6.06 %  | 4.13 %  |
|                              | Dosage                                              | 0.00 %            | 0.00 %  | 1.92 %  | 7.14 %  | 5.41 %  | 9.86 %  | 12.12 % | 5.21 % | 0.00 %          | 0.00 %  | 3.85 %  | 3.17 %  | 9.01 %  | 7.04 %  | 6.06 %  | 4.16 %  |
|                              | Technical information about healthcare technologies | 0.00 %            | 0.00 %  | 1.92 %  | 7.94 %  | 5.41 %  | 8.45 %  | 9.09 %  | 4.69 % | 0.00 %          | 0.00 %  | 5.77 %  | 4.76 %  | 11.71 % | 11.27 % | 12.12 % | 6.52 %  |
|                              | Σ                                                   | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 5.66 %  | 8.25 %  | 10.39 % | -      | 0.00 %          | 4.51 %  | 5.49 %  | 5.33 %  | 10.17 % | 8.45 %  | 7.36 %  | -       |

| Primary information category | Secondary information category                           | Not useful at all |         |         |         |         |         |         |           | Not very useful |         |         |         |         |         |         |           |
|------------------------------|----------------------------------------------------------|-------------------|---------|---------|---------|---------|---------|---------|-----------|-----------------|---------|---------|---------|---------|---------|---------|-----------|
|                              |                                                          | ≤ 18              | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | $\bar{X}$ | ≤ 18            | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | $\bar{X}$ |
| PUD_5                        | Access to emergency services                             | 0.00 %            | 0.00 %  | 1.92 %  | 6.35 %  | 8.11 %  | 12.68 % | 6.06 %  | 5.02 %    | 0.00 %          | 5.26 %  | 3.85 %  | 6.35 %  | 9.01 %  | 4.23 %  | 9.09 %  | 5.40 %    |
|                              | Access to appointments                                   | 0.00 %            | 0.00 %  | 1.92 %  | 5.56 %  | 8.11 %  | 12.68 % | 6.06 %  | 4.90 %    | 0.00 %          | 0.00 %  | 5.77 %  | 5.56 %  | 8.11 %  | 2.82 %  | 9.09 %  | 4.48 %    |
|                              | Access to treatments                                     | 0.00 %            | 0.00 %  | 0.00 %  | 7.14 %  | 7.21 %  | 11.27 % | 6.06 %  | 4.53 %    | 0.00 %          | 5.26 %  | 3.85 %  | 4.76 %  | 7.21 %  | 2.82 %  | 9.09 %  | 4.71 %    |
|                              | Access to surgeries                                      | 0.00 %            | 0.00 %  | 3.85 %  | 8.73 %  | 7.21 %  | 11.27 % | 9.09 %  | 5.73 %    | 0.00 %          | 5.26 %  | 5.77 %  | 3.17 %  | 10.81 % | 5.63 %  | 6.06 %  | 5.24 %    |
|                              | $\bar{X}$                                                | 0.00 %            | 0.00 %  | 1.92 %  | 6.94 %  | 7.66 %  | 11.97 % | 6.82 %  | -         | 0.00 %          | 3.95 %  | 4.81 %  | 4.96 %  | 8.78 %  | 3.87 %  | 8.33 %  | -         |
|                              |                                                          |                   |         |         |         |         |         |         |           |                 |         |         |         |         |         |         |           |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 0.00 %            | 5.26 %  | 1.92 %  | 7.94 %  | 12.61 % | 9.86 %  | 6.06 %  | 6.24 %    | 0.00 %          | 10.53 % | 9.62 %  | 7.94 %  | 9.01 %  | 14.08 % | 21.21 % | 10.34 %   |
|                              | Cost with medicines                                      | 0.00 %            | 0.00 %  | 3.85 %  | 7.94 %  | 11.71 % | 12.68 % | 9.09 %  | 6.47 %    | 0.00 %          | 10.53 % | 5.77 %  | 5.56 %  | 9.01 %  | 11.27 % | 21.21 % | 9.05 %    |
|                              | Cost with pharmaceutical products                        | 0.00 %            | 0.00 %  | 3.85 %  | 7.94 %  | 10.81 % | 12.68 % | 9.09 %  | 6.34 %    | 0.00 %          | 10.53 % | 5.77 %  | 5.56 %  | 10.81 % | 12.68 % | 21.21 % | 9.51 %    |
|                              | Cost with medical consumables                            | 0.00 %            | 0.00 %  | 3.85 %  | 9.52 %  | 12.61 % | 14.08 % | 6.06 %  | 6.59 %    | 0.00 %          | 10.53 % | 7.69 %  | 7.94 %  | 10.81 % | 11.27 % | 21.21 % | 9.92 %    |
|                              | Cost with laboratory consumables                         | 0.00 %            | 0.00 %  | 3.85 %  | 9.52 %  | 12.61 % | 15.49 % | 6.06 %  | 6.79 %    | 0.00 %          | 15.79 % | 11.54 % | 8.73 %  | 11.71 % | 9.86 %  | 21.21 % | 11.26 %   |
|                              | Cost with human resources                                | 0.00 %            | 0.00 %  | 3.85 %  | 9.52 %  | 11.71 % | 12.68 % | 6.06 %  | 6.26 %    | 0.00 %          | 15.79 % | 7.69 %  | 8.73 %  | 11.71 % | 11.27 % | 24.24 % | 11.35 %   |
|                              | $\bar{X}$                                                | 0.00 %            | 0.88 %  | 3.53 %  | 8.73 %  | 12.01 % | 12.91 % | 7.07 %  | -         | 0.00 %          | 12.28 % | 8.01 %  | 7.41 %  | 10.51 % | 11.74 % | 21.72 % | -         |
| PUD_7                        | Average time of appointment                              | 0.00 %            | 5.26 %  | 1.92 %  | 9.52 %  | 13.51 % | 12.68 % | 12.12 % | 7.86 %    | 0.00 %          | 10.53 % | 13.46 % | 7.14 %  | 7.21 %  | 7.04 %  | 12.12 % | 8.21 %    |
|                              | Average time of treatment                                | 0.00 %            | 5.26 %  | 1.92 %  | 8.73 %  | 12.61 % | 12.68 % | 9.09 %  | 7.19 %    | 0.00 %          | 5.26 %  | 15.38 % | 4.76 %  | 8.11 %  | 8.45 %  | 9.09 %  | 7.29 %    |
|                              | Average time of waiting                                  | 0.00 %            | 15.79 % | 7.69 %  | 11.11 % | 15.32 % | 14.08 % | 12.12 % | 10.87 %   | 0.00 %          | 10.53 % | 13.46 % | 3.17 %  | 8.11 %  | 7.04 %  | 15.15 % | 8.21 %    |
|                              | Average time of management and administration            | 0.00 %            | 15.79 % | 5.77 %  | 9.52 %  | 15.32 % | 14.08 % | 15.15 % | 10.80 %   | 0.00 %          | 10.53 % | 15.38 % | 4.76 %  | 9.01 %  | 9.86 %  | 9.09 %  | 8.38 %    |
|                              | $\bar{X}$                                                | 0.00 %            | 10.53 % | 4.33 %  | 9.72 %  | 14.19 % | 13.38 % | 12.12 % | -         | 0.00 %          | 9.21 %  | 14.42 % | 4.96 %  | 8.11 %  | 8.10 %  | 11.36 % | -         |
|                              |                                                          |                   |         |         |         |         |         |         |           |                 |         |         |         |         |         |         |           |

Table 52. (continued)

| Primary information category | Secondary information category | Moderately useful |         |         |         |         |         |        |           |
|------------------------------|--------------------------------|-------------------|---------|---------|---------|---------|---------|--------|-----------|
|                              |                                | ≤ 18              | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65   | $\bar{X}$ |
| PUD_1                        | Allergies and intolerances     | 66.67%            | 15.79%  | 9.62%   | 9.52%   | 9.01%   | 7.04%   | 12.12% | 18.54%    |
|                              | Demography                     | 66.67%            | 21.05%  | 30.77%  | 19.84%  | 19.82%  | 12.68%  | 18.18% | 27.00%    |
|                              | Pregnancy                      | 66.67%            | 15.79%  | 7.69%   | 14.29%  | 12.61%  | 15.49%  | 9.09%  | 20.23%    |
|                              | Habits                         | 66.67%            | 42.11%  | 23.08%  | 17.46%  | 16.22%  | 21.13%  | 18.18% | 29.26%    |
|                              | Clinical and family history    | 66.67%            | 10.53%  | 13.46%  | 10.32%  | 9.01%   | 11.27%  | 12.12% | 19.05%    |
|                              | Identification                 | 66.67%            | 10.53%  | 11.54%  | 12.70%  | 13.51%  | 14.08%  | 18.18% | 21.03%    |
|                              | Death                          | 66.67%            | 15.79%  | 17.31%  | 15.08%  | 14.41%  | 19.72%  | 18.18% | 23.88%    |
|                              | Pathologies                    | 66.67%            | 21.05%  | 7.69%   | 9.52%   | 10.81%  | 7.04%   | 15.15% | 19.71%    |
|                              | $\bar{X}$                      | 66.67%            | 19.08%  | 15.14%  | 13.59%  | 13.18%  | 13.56%  | 15.15% | -         |
| PUD_2                        | Anthropometric evaluation      | 66.67%            | 52.63%  | 26.92%  | 14.29%  | 15.32%  | 16.90%  | 30.30% | 31.86%    |
|                              | Laboratory tests               | 66.67%            | 10.53%  | 13.46%  | 7.94%   | 14.41%  | 8.45%   | 12.12% | 19.08%    |
|                              | Imaging exams                  | 66.67%            | 15.79%  | 13.46%  | 9.52%   | 14.41%  | 9.86%   | 9.09%  | 19.83%    |
|                              | Rapid tests                    | 66.67%            | 31.58%  | 19.23%  | 12.70%  | 14.41%  | 9.86%   | 12.12% | 23.80%    |

| Primary information category | Secondary information category                           | Moderately useful |         |         |         |         |         |        |           |
|------------------------------|----------------------------------------------------------|-------------------|---------|---------|---------|---------|---------|--------|-----------|
|                              |                                                          | ≤ 18              | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65   | $\bar{X}$ |
| PUD_3                        | Physical exams                                           | 66.67%            | 21.05%  | 13.46%  | 11.11%  | 13.51%  | 7.04%   | 15.15% | 21.14%    |
|                              | Electrocardiogram                                        | 66.67%            | 26.32%  | 17.31%  | 10.32%  | 13.51%  | 7.04%   | 9.09%  | 21.46%    |
|                              | Vital parameters                                         | 66.67%            | 26.32%  | 15.38%  | 10.32%  | 12.61%  | 7.04%   | 15.15% | 21.93%    |
|                              | $\bar{X}$                                                | 66.67%            | 26.32%  | 17.03%  | 10.88%  | 14.03%  | 9.46%   | 14.72% | -         |
|                              | Vaccination and immunization                             | 33.33%            | 21.05%  | 11.54%  | 7.14%   | 9.01%   | 14.08%  | 6.06%  | 14.60%    |
|                              | Screenings                                               | 33.33%            | 26.32%  | 15.38%  | 11.11%  | 11.71%  | 11.27%  | 9.09%  | 16.89%    |
|                              | Diet                                                     | 33.33%            | 26.32%  | 26.92%  | 18.25%  | 16.22%  | 18.31%  | 12.12% | 21.64%    |
| PUD_4                        | Physical activity                                        | 33.33%            | 26.32%  | 30.77%  | 20.63%  | 14.41%  | 21.13%  | 15.15% | 23.11%    |
|                              | Antimicrobial resistance                                 | 33.33%            | 31.58%  | 17.31%  | 11.90%  | 9.91%   | 12.68%  | 12.12% | 18.40%    |
|                              | Smoking                                                  | 33.33%            | 21.05%  | 23.08%  | 18.25%  | 12.61%  | 14.08%  | 9.09%  | 18.79%    |
|                              | Epidemiology                                             | 33.33%            | 26.32%  | 17.31%  | 15.87%  | 12.61%  | 11.27%  | 15.15% | 18.84%    |
|                              | $\bar{X}$                                                | 33.33%            | 25.56%  | 20.33%  | 14.74%  | 12.36%  | 14.69%  | 11.26% | -         |
|                              | Medicines                                                | 66.67%            | 21.05%  | 11.54%  | 7.14%   | 9.91%   | 9.86%   | 12.12% | 19.76%    |
|                              | Pharmaceutical products                                  | 66.67%            | 15.79%  | 19.23%  | 11.90%  | 13.51%  | 12.68%  | 12.12% | 21.70%    |
| PUD_5                        | Medical consumables                                      | 66.67%            | 15.79%  | 26.92%  | 18.25%  | 11.71%  | 21.13%  | 9.09%  | 24.22%    |
|                              | Laboratory consumables                                   | 66.67%            | 21.05%  | 26.92%  | 19.05%  | 14.41%  | 21.13%  | 9.09%  | 25.47%    |
|                              | Drug interactions                                        | 66.67%            | 21.05%  | 11.54%  | 11.90%  | 9.01%   | 11.27%  | 6.06%  | 19.64%    |
|                              | Dosage                                                   | 66.67%            | 31.58%  | 11.54%  | 10.32%  | 9.91%   | 11.27%  | 6.06%  | 21.05%    |
|                              | Technical information about healthcare technologies      | 66.67%            | 26.32%  | 21.15%  | 9.52%   | 12.61%  | 16.90%  | 6.06%  | 22.75%    |
|                              | $\bar{X}$                                                | 66.67%            | 21.80%  | 18.41%  | 12.59%  | 11.58%  | 14.89%  | 8.66%  | -         |
|                              | Access to emergency services                             | 66.67%            | 26.32%  | 11.54%  | 11.11%  | 11.71%  | 7.04%   | 12.12% | 20.93%    |
| PUD_6                        | Access to appointments                                   | 66.67%            | 26.32%  | 5.77%   | 8.73%   | 8.11%   | 7.04%   | 15.15% | 19.68%    |
|                              | Access to treatments                                     | 66.67%            | 21.05%  | 15.38%  | 7.14%   | 11.71%  | 8.45%   | 15.15% | 20.79%    |
|                              | Access to surgeries                                      | 66.67%            | 15.79%  | 13.46%  | 7.94%   | 9.91%   | 8.45%   | 15.15% | 19.62%    |
|                              | $\bar{X}$                                                | 66.67%            | 22.37%  | 11.54%  | 8.73%   | 10.36%  | 7.75%   | 14.39% | -         |
|                              | Cost with complementary diagnostic and therapeutic exams | 66.67%            | 15.79%  | 13.46%  | 18.25%  | 18.02%  | 11.27%  | 6.06%  | 21.36%    |
|                              | Cost with medicines                                      | 66.67%            | 21.05%  | 9.62%   | 15.08%  | 15.32%  | 11.27%  | 9.09%  | 21.16%    |
|                              | Cost with pharmaceutical products                        | 66.67%            | 26.32%  | 11.54%  | 19.84%  | 15.32%  | 9.86%   | 9.09%  | 22.66%    |
| PUD_7                        | Cost with medical consumables                            | 66.67%            | 21.05%  | 21.15%  | 19.84%  | 17.12%  | 11.27%  | 12.12% | 24.17%    |
|                              | Cost with laboratory consumables                         | 66.67%            | 21.05%  | 19.23%  | 19.05%  | 17.12%  | 12.68%  | 15.15% | 24.42%    |
|                              | Cost with human resources                                | 66.67%            | 26.32%  | 26.92%  | 21.43%  | 19.82%  | 15.49%  | 12.12% | 26.97%    |
|                              | $\bar{X}$                                                | 66.67%            | 21.93%  | 16.99%  | 18.92%  | 17.12%  | 11.97%  | 10.61% | -         |
|                              | Average time of appointment                              | 66.67%            | 31.58%  | 25.00%  | 18.25%  | 23.42%  | 22.54%  | 24.24% | 30.24%    |
|                              | Average time of treatment                                | 66.67%            | 36.84%  | 15.38%  | 18.25%  | 23.42%  | 16.90%  | 21.21% | 28.38%    |
|                              | Average time of waiting                                  | 66.67%            | 15.79%  | 11.54%  | 15.87%  | 19.82%  | 19.72%  | 18.18% | 23.94%    |
| PUD_7                        | Average time of management and administration            | 66.67%            | 21.05%  | 25.00%  | 21.43%  | 21.62%  | 21.13%  | 33.33% | 30.03%    |
|                              | $\bar{X}$                                                | 66.67%            | 26.32%  | 19.23%  | 18.45%  | 22.07%  | 20.07%  | 24.24% | -         |

Table 52. (continued)

| Primary information category | Secondary information category                      | Useful  |         |         |         |         |         |         |         | Very useful |         |         |         |         |         |         |         |
|------------------------------|-----------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|-------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                     | ≤ 18    | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | X       | ≤ 18        | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | X       |
| PUD_1                        | Allergies and intolerances                          | 33.33 % | 36.84 % | 30.77 % | 31.75 % | 33.33 % | 39.44 % | 45.45 % | 35.85 % | 0.00 %      | 42.11 % | 51.92 % | 46.03 % | 44.14 % | 36.62 % | 27.27 % | 35.44 % |
|                              | Demography                                          | 33.33 % | 31.58 % | 26.92 % | 37.30 % | 36.04 % | 45.07 % | 51.52 % | 37.39 % | 0.00 %      | 10.53 % | 28.85 % | 26.19 % | 18.02 % | 14.08 % | 3.03 %  | 14.39 % |
|                              | Pregnancy                                           | 33.33 % | 42.11 % | 28.85 % | 34.13 % | 31.53 % | 38.03 % | 42.42 % | 35.77 % | 0.00 %      | 26.32 % | 55.77 % | 39.68 % | 38.74 % | 29.58 % | 27.27 % | 31.05 % |
|                              | Habits                                              | 33.33 % | 42.11 % | 38.46 % | 39.68 % | 38.74 % | 38.03 % | 54.55 % | 40.70 % | 0.00 %      | 15.79 % | 30.77 % | 30.95 % | 26.13 % | 21.13 % | 9.09 %  | 19.12 % |
|                              | Clinical and family history                         | 33.33 % | 47.37 % | 25.00 % | 34.13 % | 29.73 % | 30.99 % | 45.45 % | 35.14 % | 0.00 %      | 31.58 % | 59.62 % | 46.83 % | 47.75 % | 43.66 % | 30.30 % | 37.10 % |
|                              | Identification                                      | 33.33 % | 42.11 % | 26.92 % | 35.71 % | 41.44 % | 43.66 % | 48.48 % | 38.81 % | 0.00 %      | 36.84 % | 53.85 % | 42.06 % | 35.14 % | 26.76 % | 21.21 % | 30.84 % |
|                              | Death                                               | 33.33 % | 36.84 % | 28.85 % | 38.89 % | 33.33 % | 39.44 % | 54.55 % | 37.89 % | 0.00 %      | 21.05 % | 40.38 % | 34.13 % | 31.53 % | 21.13 % | 12.12 % | 22.91 % |
|                              | Pathologies                                         | 33.33 % | 36.84 % | 25.00 % | 24.60 % | 30.63 % | 33.80 % | 33.33 % | 31.08 % | 0.00 %      | 36.84 % | 63.46 % | 56.35 % | 46.85 % | 43.66 % | 39.39 % | 40.94 % |
|                              | X                                                   | 33.33 % | 39.47 % | 28.85 % | 34.52 % | 34.35 % | 38.56 % | 46.97 % | -       | 0.00 %      | 27.63 % | 48.08 % | 40.28 % | 36.04 % | 29.58 % | 21.21 % | -       |
| PUD_2                        | Anthropometric evaluation                           | 33.33 % | 31.58 % | 30.77 % | 40.48 % | 41.44 % | 43.66 % | 36.36 % | 36.80 % | 0.00 %      | 15.79 % | 28.85 % | 32.54 % | 25.23 % | 22.54 % | 9.09 %  | 19.15 % |
|                              | Laboratory tests                                    | 33.33 % | 52.63 % | 25.00 % | 29.37 % | 32.43 % | 35.21 % | 42.42 % | 35.77 % | 0.00 %      | 31.58 % | 59.62 % | 51.59 % | 42.34 % | 43.66 % | 33.33 % | 37.45 % |
|                              | Imaging exams                                       | 33.33 % | 36.84 % | 26.92 % | 29.37 % | 31.53 % | 30.99 % | 39.39 % | 32.62 % | 0.00 %      | 36.84 % | 53.85 % | 50.79 % | 42.34 % | 46.48 % | 36.36 % | 38.10 % |
|                              | Rapid tests                                         | 33.33 % | 31.58 % | 30.77 % | 33.33 % | 34.23 % | 46.48 % | 39.39 % | 35.59 % | 0.00 %      | 31.58 % | 44.23 % | 43.65 % | 38.74 % | 29.58 % | 27.27 % | 30.72 % |
|                              | Physical exams                                      | 33.33 % | 47.37 % | 26.92 % | 34.92 % | 33.33 % | 42.25 % | 33.33 % | 35.92 % | 0.00 %      | 31.58 % | 51.92 % | 42.06 % | 39.64 % | 33.80 % | 30.30 % | 32.76 % |
|                              | Electrocardiogram                                   | 33.33 % | 36.84 % | 30.77 % | 32.54 % | 27.93 % | 33.80 % | 36.36 % | 33.08 % | 0.00 %      | 31.58 % | 50.00 % | 46.03 % | 45.05 % | 42.25 % | 33.33 % | 35.46 % |
|                              | Vital parameters                                    | 33.33 % | 42.11 % | 34.62 % | 32.54 % | 34.23 % | 35.21 % | 33.33 % | 35.05 % | 0.00 %      | 31.58 % | 46.15 % | 46.03 % | 39.64 % | 40.85 % | 30.30 % | 33.51 % |
|                              | X                                                   | 33.33 % | 39.85 % | 29.40 % | 33.22 % | 33.59 % | 38.23 % | 37.23 % | -       | 0.00 %      | 30.08 % | 47.80 % | 44.67 % | 39.00 % | 37.02 % | 28.57 % | -       |
| PUD_3                        | Vaccination and immunization                        | 66.67 % | 42.11 % | 26.92 % | 26.19 % | 29.73 % | 23.94 % | 33.33 % | 35.56 % | 0.00 %      | 31.58 % | 59.62 % | 54.76 % | 50.45 % | 50.70 % | 48.48 % | 42.23 % |
|                              | Screenings                                          | 66.67 % | 36.84 % | 28.85 % | 26.19 % | 28.83 % | 26.76 % | 33.33 % | 35.35 % | 0.00 %      | 36.84 % | 53.85 % | 51.59 % | 48.65 % | 52.11 % | 45.45 % | 41.21 % |
|                              | Diet                                                | 66.67 % | 36.84 % | 32.69 % | 38.10 % | 42.34 % | 36.62 % | 48.48 % | 43.11 % | 0.00 %      | 31.58 % | 32.69 % | 30.16 % | 27.03 % | 30.99 % | 24.24 % | 25.24 % |
|                              | Physical activity                                   | 66.67 % | 36.84 % | 25.00 % | 33.33 % | 42.34 % | 36.62 % | 36.36 % | 39.60 % | 0.00 %      | 31.58 % | 34.62 % | 32.54 % | 27.03 % | 30.99 % | 24.24 % | 25.86 % |
|                              | Antimicrobial resistance                            | 66.67 % | 36.84 % | 32.69 % | 34.92 % | 35.14 % | 35.21 % | 39.39 % | 40.12 % | 0.00 %      | 31.58 % | 40.38 % | 42.06 % | 38.74 % | 40.85 % | 30.30 % | 31.99 % |
|                              | Smoking                                             | 33.33 % | 42.11 % | 25.00 % | 37.30 % | 37.84 % | 40.85 % | 42.42 % | 36.98 % | 33.33 %     | 31.58 % | 40.38 % | 32.54 % | 32.43 % | 29.58 % | 24.24 % | 32.01 % |
|                              | Epidemiology                                        | 66.67 % | 42.11 % | 28.85 % | 34.13 % | 32.43 % | 38.03 % | 42.42 % | 40.66 % | 0.00 %      | 31.58 % | 50.00 % | 39.68 % | 42.34 % | 39.44 % | 24.24 % | 32.47 % |
|                              | X                                                   | 61.90 % | 39.10 % | 28.57 % | 32.88 % | 35.52 % | 34.00 % | 39.39 % | -       | 4.76 %      | 32.33 % | 44.51 % | 40.48 % | 38.10 % | 39.24 % | 31.60 % | -       |
| PUD_4                        | Medicines                                           | 33.33 % | 42.11 % | 26.92 % | 26.98 % | 27.03 % | 26.76 % | 36.36 % | 31.36 % | 0.00 %      | 36.84 % | 59.62 % | 57.14 % | 51.35 % | 52.11 % | 36.36 % | 41.92 % |
|                              | Pharmaceutical products                             | 33.33 % | 47.37 % | 32.69 % | 34.92 % | 30.63 % | 33.80 % | 39.39 % | 36.02 % | 0.00 %      | 26.32 % | 42.31 % | 42.06 % | 43.24 % | 39.44 % | 33.33 % | 32.39 % |
|                              | Medical consumables                                 | 33.33 % | 42.11 % | 32.69 % | 34.92 % | 33.33 % | 35.21 % | 48.48 % | 37.15 % | 0.00 %      | 31.58 % | 28.85 % | 33.33 % | 33.33 % | 25.35 % | 24.24 % | 25.24 % |
|                              | Laboratory consumables                              | 33.33 % | 42.11 % | 30.77 % | 32.54 % | 32.43 % | 35.21 % | 48.48 % | 36.41 % | 0.00 %      | 26.32 % | 28.85 % | 34.92 % | 32.43 % | 23.94 % | 24.24 % | 24.39 % |
|                              | Drug interactions                                   | 33.33 % | 47.37 % | 36.54 % | 30.16 % | 33.33 % | 30.99 % | 42.42 % | 36.31 % | 0.00 %      | 31.58 % | 46.15 % | 46.03 % | 45.05 % | 40.85 % | 33.33 % | 34.71 % |
|                              | Dosage                                              | 33.33 % | 36.84 % | 28.85 % | 30.95 % | 27.93 % | 32.39 % | 39.39 % | 32.81 % | 0.00 %      | 31.58 % | 53.85 % | 48.41 % | 47.75 % | 39.44 % | 36.36 % | 36.77 % |
|                              | Technical information about healthcare technologies | 33.33 % | 47.37 % | 28.85 % | 39.68 % | 28.83 % | 38.03 % | 45.45 % | 37.36 % | 0.00 %      | 26.32 % | 42.31 % | 38.10 % | 41.44 % | 25.35 % | 27.27 % | 28.68 % |
|                              | X                                                   | 33.33 % | 43.61 % | 31.04 % | 32.88 % | 30.50 % | 33.20 % | 42.86 % | -       | 0.00 %      | 30.08 % | 43.13 % | 42.86 % | 42.08 % | 35.21 % | 30.74 % | -       |
| PUD_5                        | Access to emergency services                        | 33.33 % | 42.11 % | 21.15 % | 31.75 % | 30.63 % | 28.17 % | 36.36 % | 31.93 % | 0.00 %      | 26.32 % | 61.54 % | 44.44 % | 40.54 % | 47.89 % | 36.36 % | 36.73 % |
|                              | Access to appointments                              | 33.33 % | 36.84 % | 23.08 % | 31.75 % | 33.33 % | 30.99 % | 33.33 % | 31.81 % | 0.00 %      | 36.84 % | 63.46 % | 48.41 % | 42.34 % | 46.48 % | 36.36 % | 39.13 % |
|                              | Access to treatments                                | 33.33 % | 36.84 % | 21.15 % | 31.75 % | 30.63 % | 33.80 % | 33.33 % | 31.55 % | 0.00 %      | 36.84 % | 59.62 % | 49.21 % | 43.24 % | 43.66 % | 36.36 % | 38.42 % |
|                              | Access to surgeries                                 | 33.33 % | 36.84 % | 19.23 % | 31.75 % | 29.73 % | 30.99 % | 33.33 % | 30.74 % | 0.00 %      | 42.11 % | 57.69 % | 48.41 % | 42.34 % | 43.66 % | 36.36 % | 38.65 % |

| Primary information category | Secondary information category                           | Useful  |         |         |         |         |         |         |         | Very useful |         |         |         |         |         |         |         |
|------------------------------|----------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|-------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                          | ≤ 18    | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | X̄      | ≤ 18        | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | X̄      |
|                              | X̄                                                       | 33.33 % | 38.16 % | 21.15 % | 31.75 % | 31.08 % | 30.99 % | 34.09 % | -       | 0.00 %      | 35.53 % | 60.58 % | 47.62 % | 42.12 % | 45.42 % | 36.36 % | -       |
| PUD_6                        | Cost with complementary diagnostic and therapeutic exams | 33.33 % | 52.63 % | 32.69 % | 33.33 % | 37.84 % | 39.44 % | 33.33 % | 37.51 % | 0.00 %      | 15.79 % | 42.31 % | 32.54 % | 22.52 % | 25.35 % | 33.33 % | 24.55 % |
|                              | Cost with medicines                                      | 33.33 % | 42.11 % | 28.85 % | 34.92 % | 36.04 % | 40.85 % | 27.27 % | 34.77 % | 0.00 %      | 26.32 % | 51.92 % | 36.51 % | 27.93 % | 23.94 % | 33.33 % | 28.56 % |
|                              | Cost with pharmaceutical products                        | 33.33 % | 42.11 % | 36.54 % | 36.51 % | 35.14 % | 42.25 % | 27.27 % | 36.16 % | 0.00 %      | 21.05 % | 42.31 % | 30.16 % | 27.93 % | 22.54 % | 33.33 % | 25.33 % |
|                              | Cost with medical consumables                            | 33.33 % | 47.37 % | 34.62 % | 37.30 % | 36.04 % | 43.66 % | 27.27 % | 37.08 % | 0.00 %      | 21.05 % | 32.69 % | 25.40 % | 23.42 % | 19.72 % | 33.33 % | 22.23 % |
|                              | Cost with laboratory consumables                         | 33.33 % | 42.11 % | 30.77 % | 37.30 % | 35.14 % | 39.44 % | 24.24 % | 34.62 % | 0.00 %      | 21.05 % | 34.62 % | 25.40 % | 23.42 % | 22.54 % | 33.33 % | 22.91 % |
|                              | Cost with human resources                                | 33.33 % | 36.84 % | 28.85 % | 35.71 % | 33.33 % | 36.62 % | 27.27 % | 33.14 % | 0.00 %      | 21.05 % | 32.69 % | 24.60 % | 23.42 % | 23.94 % | 30.30 % | 22.29 % |
|                              | X̄                                                       | 33.33 % | 43.86 % | 32.05 % | 35.85 % | 35.59 % | 40.38 % | 27.78 % | -       | 0.00 %      | 21.05 % | 39.42 % | 29.10 % | 24.77 % | 23.00 % | 32.83 % | -       |
| PUD_7                        | Average time of appointment                              | 33.33 % | 42.11 % | 38.46 % | 30.95 % | 33.33 % | 33.80 % | 27.27 % | 34.18 % | 0.00 %      | 10.53 % | 21.15 % | 34.13 % | 22.52 % | 23.94 % | 24.24 % | 19.50 % |
|                              | Average time of treatment                                | 33.33 % | 42.11 % | 38.46 % | 34.13 % | 32.43 % | 39.44 % | 39.39 % | 37.04 % | 0.00 %      | 10.53 % | 28.85 % | 34.13 % | 23.42 % | 22.54 % | 21.21 % | 20.10 % |
|                              | Average time of waiting                                  | 33.33 % | 47.37 % | 38.46 % | 30.95 % | 32.43 % | 29.58 % | 21.21 % | 33.33 % | 0.00 %      | 10.53 % | 28.85 % | 38.89 % | 24.32 % | 29.58 % | 33.33 % | 23.64 % |
|                              | Average time of management and administration            | 33.33 % | 36.84 % | 32.69 % | 33.33 % | 33.33 % | 30.99 % | 21.21 % | 31.68 % | 0.00 %      | 15.79 % | 21.15 % | 30.95 % | 20.72 % | 23.94 % | 21.21 % | 19.11 % |
|                              | X̄                                                       | 33.33 % | 42.11 % | 37.02 % | 32.34 % | 32.88 % | 33.45 % | 27.27 % | -       | 0.00 %      | 11.84 % | 25.00 % | 34.52 % | 22.75 % | 25.00 % | 25.00 % | -       |

## Annex XXI – Healthcare stakeholders' perspectives about healthcare data importance: standard deviation

Table 53. Healthcare stakeholders' perspectives about healthcare data importance: standard deviation

| Primary information category | Secondary information category                      | Standard deviation |      |      |      |      |           |
|------------------------------|-----------------------------------------------------|--------------------|------|------|------|------|-----------|
|                              |                                                     | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ |
| PID_1 <sup>a)</sup>          | Allergies and intolerances                          | 0.65               | 1.07 | 0.70 | 1.01 | 0.67 | 0.82      |
|                              | Demography                                          | 0.94               | 1.13 | 0.68 | 0.96 | 1.00 | 0.94      |
|                              | Pregnancy                                           | 0.71               | 1.13 | 0.70 | 1.21 | 0.75 | 0.90      |
|                              | Habits                                              | 0.73               | 1.08 | 0.70 | 1.06 | 0.75 | 0.86      |
|                              | Clinical and family history                         | 0.64               | 1.07 | 0.70 | 0.99 | 0.79 | 0.84      |
|                              | Identification                                      | 0.66               | 1.11 | 0.77 | 0.90 | 0.77 | 0.84      |
|                              | Death                                               | 0.93               | 1.16 | 0.77 | 1.11 | 1.04 | 1.00      |
|                              | Pathologies                                         | 0.61               | 1.08 | 0.77 | 0.86 | 0.79 | 0.82      |
|                              | $\bar{X}$                                           | 0.73               | 1.10 | 0.72 | 1.01 | 0.82 | -         |
| PID_2 <sup>a)</sup>          | Anthropometric evaluation                           | 0.88               | 1.10 | 0.80 | 0.98 | 0.79 | 0.91      |
|                              | Laboratory tests                                    | 0.78               | 1.04 | 0.83 | 0.67 | 0.69 | 0.80      |
|                              | Imaging exams                                       | 0.79               | 1.04 | 0.83 | 0.66 | 0.69 | 0.80      |
|                              | Rapid tests                                         | 0.84               | 1.05 | 0.79 | 0.66 | 0.81 | 0.83      |
|                              | Physical exams                                      | 0.84               | 1.03 | 0.79 | 0.57 | 0.79 | 0.80      |
|                              | Electrocardiogram                                   | 0.89               | 1.02 | 0.84 | 0.72 | 0.69 | 0.83      |
|                              | Vital parameters                                    | 0.80               | 1.04 | 0.81 | 0.67 | 0.69 | 0.80      |
|                              | $\bar{X}$                                           | 0.83               | 1.05 | 0.81 | 0.70 | 0.73 | -         |
| PID_3 <sup>a)</sup>          | Vaccination and immunization                        | 0.71               | 1.07 | 0.83 | 0.91 | 0.69 | 0.84      |
|                              | Screenings                                          | 0.75               | 1.07 | 0.81 | 0.66 | 0.79 | 0.82      |
|                              | Diet                                                | 0.83               | 1.08 | 0.81 | 0.58 | 1.04 | 0.87      |
|                              | Physical activity                                   | 0.85               | 1.09 | 0.79 | 0.61 | 0.98 | 0.86      |
|                              | Antimicrobial resistance                            | 0.76               | 1.11 | 0.83 | 0.60 | 0.69 | 0.80      |
|                              | Smoking                                             | 0.79               | 1.11 | 0.84 | 1.02 | 0.69 | 0.89      |
|                              | Epidemiology                                        | 0.88               | 1.07 | 0.81 | 0.59 | 0.79 | 0.83      |
|                              | $\bar{X}$                                           | 0.80               | 1.09 | 0.81 | 0.71 | 0.81 | -         |
| PID_4 <sup>a)</sup>          | Medicines                                           | 0.65               | 1.07 | 0.85 | 0.91 | 0.69 | 0.83      |
|                              | Pharmaceutical products                             | 0.78               | 1.09 | 0.81 | 0.94 | 0.79 | 0.88      |
|                              | Medical consumables                                 | 0.92               | 1.13 | 0.87 | 0.91 | 0.79 | 0.92      |
|                              | Laboratory consumables                              | 0.96               | 1.14 | 0.86 | 0.75 | 0.79 | 0.90      |
|                              | Drug interactions                                   | 0.78               | 1.10 | 0.83 | 0.80 | 0.67 | 0.84      |
|                              | Dosage                                              | 0.79               | 1.09 | 0.83 | 0.78 | 0.67 | 0.83      |
|                              | Technical information about healthcare technologies | 0.89               | 1.13 | 0.81 | 1.02 | 0.67 | 0.90      |

| Primary information category | Secondary information category                           | Standard deviation |      |      |      |      |           |
|------------------------------|----------------------------------------------------------|--------------------|------|------|------|------|-----------|
|                              |                                                          | Hpro               | Pati | Admi | Mana | Pmkr | $\bar{X}$ |
|                              | $\bar{X}$                                                | 0.82               | 1.11 | 0.84 | 0.87 | 0.72 | -         |
| PID_5 <sup>a)</sup>          | Access to emergency services                             | 0.84               | 1.10 | 0.86 | 0.85 | 0.67 | 0.86      |
|                              | Access to appointments                                   | 0.76               | 1.06 | 0.86 | 0.91 | 0.67 | 0.85      |
|                              | Access to treatments                                     | 0.79               | 1.06 | 0.86 | 0.77 | 0.67 | 0.83      |
|                              | Access to surgeries                                      | 0.87               | 1.08 | 0.86 | 0.60 | 0.67 | 0.81      |
|                              | $\bar{X}$                                                | 0.81               | 1.07 | 0.86 | 0.78 | 0.67 | -         |
| PID_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 1.03               | 1.16 | 1.00 | 1.11 | 0.67 | 1.00      |
|                              | Cost with medicines                                      | 1.00               | 1.15 | 1.00 | 1.02 | 0.65 | 0.96      |
|                              | Cost with pharmaceutical products                        | 1.04               | 1.14 | 1.00 | 0.87 | 0.89 | 0.99      |
|                              | Cost with medical consumables                            | 1.03               | 1.18 | 0.91 | 0.90 | 0.87 | 0.98      |
|                              | Cost with laboratory consumables                         | 1.05               | 1.17 | 0.96 | 0.95 | 0.94 | 1.02      |
|                              | Cost with human resources                                | 1.06               | 1.19 | 0.96 | 1.13 | 0.98 | 1.06      |
|                              | $\bar{X}$                                                | 1.04               | 1.17 | 0.97 | 1.00 | 0.84 | -         |
| PID_7 <sup>a)</sup>          | Average time of appointment                              | 0.98               | 1.16 | 0.84 | 0.63 | 0.52 | 0.83      |
|                              | Average time of treatment                                | 0.96               | 1.14 | 0.84 | 0.77 | 0.52 | 0.85      |
|                              | Average time of waiting                                  | 0.95               | 1.16 | 0.91 | 0.77 | 0.52 | 0.86      |
|                              | Average time of management and administration            | 0.96               | 1.21 | 0.94 | 0.93 | 0.50 | 0.91      |
|                              | $\bar{X}$                                                | 0.96               | 1.17 | 0.88 | 0.77 | 0.52 | -         |

## Annex XXII – Healthcare stakeholders' perspectives about healthcare data: importance analysis (%)

Table 54. Healthcare stakeholders' perspectives about healthcare data: importance analysis (%)

| Primary information category | Secondary information category | Not important at all |       |       |       |       |           | Not very important |       |       |       |       |           |
|------------------------------|--------------------------------|----------------------|-------|-------|-------|-------|-----------|--------------------|-------|-------|-------|-------|-----------|
|                              |                                | Hpro                 | Pati  | Admi  | Mana  | Pmkr  | $\bar{X}$ | Hpro               | Pati  | Admi  | Mana  | Pmkr  | $\bar{X}$ |
| PID_1                        | Allergies and intolerances     | 0.74%                | 4.58% | 0.00% | 4.55% | 0.00% | 1.97%     | 1.11%              | 3.61% | 0.00% | 0.00% | 0.00% | 0.94%     |
|                              | Demography                     | 1.85%                | 5.78% | 0.00% | 4.55% | 0.00% | 2.43%     | 6.64%              | 9.40% | 0.00% | 0.00% | 9.09% | 5.03%     |
|                              | Pregnancy                      | 0.37%                | 6.27% | 0.00% | 9.09% | 0.00% | 3.14%     | 1.11%              | 3.61% | 0.00% | 0.00% | 0.00% | 0.94%     |
|                              | Habits                         | 0.37%                | 5.54% | 0.00% | 4.55% | 0.00% | 2.09%     | 1.11%              | 4.58% | 0.00% | 0.00% | 0.00% | 1.14%     |
|                              | Clinical and family history    | 0.00%                | 5.06% | 0.00% | 4.55% | 0.00% | 1.92%     | 0.74%              | 2.89% | 0.00% | 0.00% | 0.00% | 0.73%     |
|                              | Identification                 | 0.37%                | 5.78% | 0.00% | 0.00% | 0.00% | 1.23%     | 0.74%              | 4.82% | 0.00% | 4.55% | 0.00% | 2.02%     |
|                              | Death                          | 1.85%                | 7.23% | 0.00% | 4.55% | 0.00% | 2.72%     | 4.06%              | 5.54% | 0.00% | 4.55% | 9.09% | 4.65%     |
|                              | Pathologies                    | 0.74%                | 5.06% | 0.00% | 0.00% | 0.00% | 1.16%     | 0.00%              | 3.37% | 0.00% | 4.55% | 0.00% | 1.58%     |
| $\bar{X}$                    |                                | 0.78%                | 5.66% | 0.00% | 3.98% | 0.00% | -         | 1.94%              | 4.73% | 0.00% | 1.70% | 2.27% | -         |
| PID_2                        | Anthropometric evaluation      | 0.74%                | 5.06% | 0.00% | 4.55% | 0.00% | 2.07%     | 5.17%              | 7.23% | 5.56% | 0.00% | 0.00% | 3.59%     |
|                              | Laboratory tests               | 0.74%                | 4.34% | 0.00% | 0.00% | 0.00% | 1.02%     | 2.21%              | 4.10% | 5.56% | 0.00% | 0.00% | 2.37%     |
|                              | Imaging exams                  | 0.74%                | 4.34% | 0.00% | 0.00% | 0.00% | 1.02%     | 2.58%              | 3.86% | 5.56% | 0.00% | 0.00% | 2.40%     |
|                              | Rapid tests                    | 0.74%                | 4.58% | 0.00% | 0.00% | 0.00% | 1.06%     | 3.32%              | 4.58% | 5.56% | 0.00% | 0.00% | 2.69%     |
|                              | Physical exams                 | 0.74%                | 4.34% | 0.00% | 0.00% | 0.00% | 1.02%     | 3.69%              | 4.10% | 5.56% | 0.00% | 0.00% | 2.67%     |
|                              | Electrocardiogram              | 1.11%                | 4.34% | 0.00% | 0.00% | 0.00% | 1.09%     | 5.17%              | 3.37% | 5.56% | 0.00% | 0.00% | 2.82%     |
|                              | Vital parameters               | 0.74%                | 4.58% | 0.00% | 0.00% | 0.00% | 1.06%     | 2.95%              | 3.37% | 5.56% | 0.00% | 0.00% | 2.38%     |
| $\bar{X}$                    |                                | 0.79%                | 4.51% | 0.00% | 0.65% | 0.00% | -         | 3.58%              | 4.37% | 5.56% | 0.00% | 0.00% | -         |
| PID_3                        | Vaccination and immunization   | 0.00%                | 5.06% | 0.00% | 4.55% | 0.00% | 1.92%     | 2.21%              | 3.37% | 5.56% | 0.00% | 0.00% | 2.23%     |
|                              | Screenings                     | 0.00%                | 5.30% | 0.00% | 0.00% | 0.00% | 1.06%     | 2.58%              | 2.89% | 5.56% | 0.00% | 0.00% | 2.21%     |
|                              | Diet                           | 0.37%                | 6.02% | 0.00% | 0.00% | 0.00% | 1.28%     | 3.69%              | 3.86% | 5.56% | 0.00% | 9.09% | 4.44%     |
|                              | Physical activity              | 0.74%                | 5.78% | 0.00% | 0.00% | 0.00% | 1.30%     | 4.06%              | 4.82% | 5.56% | 0.00% | 9.09% | 4.70%     |
|                              | Antimicrobial resistance       | 0.37%                | 5.54% | 0.00% | 0.00% | 0.00% | 1.18%     | 1.85%              | 4.58% | 5.56% | 0.00% | 0.00% | 2.40%     |
|                              | Smoking                        | 0.37%                | 6.51% | 0.00% | 4.55% | 0.00% | 2.28%     | 2.21%              | 3.86% | 5.56% | 4.55% | 0.00% | 3.23%     |
|                              | Epidemiology                   | 0.74%                | 5.30% | 0.00% | 0.00% | 0.00% | 1.21%     | 4.80%              | 2.89% | 5.56% | 0.00% | 0.00% | 2.65%     |
| $\bar{X}$                    |                                | 0.37%                | 5.65% | 0.00% | 1.30% | 0.00% | -         | 3.06%              | 3.75% | 5.56% | 0.65% | 2.60% | -         |
| PID_4                        | Medicines                      | 0.00%                | 5.30% | 0.00% | 4.55% | 0.00% | 1.97%     | 1.11%              | 2.89% | 5.56% | 0.00% | 0.00% | 1.91%     |
|                              | Pharmaceutical products        | 0.00%                | 5.54% | 0.00% | 4.55% | 0.00% | 2.02%     | 2.58%              | 3.86% | 5.56% | 0.00% | 0.00% | 2.40%     |
|                              | Medical consumables            | 0.74%                | 6.02% | 0.00% | 4.55% | 0.00% | 2.26%     | 5.90%              | 6.99% | 5.56% | 0.00% | 0.00% | 3.69%     |
|                              | Laboratory consumables         | 1.11%                | 6.27% | 0.00% | 0.00% | 0.00% | 1.47%     | 7.01%              | 6.99% | 5.56% | 4.55% | 0.00% | 4.82%     |
|                              | Drug interactions              | 0.74%                | 5.78% | 0.00% | 0.00% | 0.00% | 1.30%     | 2.21%              | 3.61% | 5.56% | 4.55% | 0.00% | 3.19%     |
|                              | Dosage                         | 0.74%                | 5.54% | 0.00% | 0.00% | 0.00% | 1.26%     | 2.58%              | 3.13% | 5.56% | 4.55% | 0.00% | 3.16%     |
|                              | Technical information about    | 1.11%                | 5.54% | 0.00% | 4.55% | 0.00% | 2.24%     | 3.69%              | 6.75% | 5.56% | 4.55% | 0.00% | 4.11%     |

| Primary information category | Secondary information category                           | Not important at all |       |       |       |       |           | Not very important |       |        |        |       |           |
|------------------------------|----------------------------------------------------------|----------------------|-------|-------|-------|-------|-----------|--------------------|-------|--------|--------|-------|-----------|
|                              |                                                          | Hpro                 | Pati  | Admi  | Mana  | Pmkr  | $\bar{X}$ | Hpro               | Pati  | Admi   | Mana   | Pmkr  | $\bar{X}$ |
|                              | healthcare technologies                                  |                      |       |       |       |       |           |                    |       |        |        |       |           |
|                              | $\bar{X}$                                                | 0.63%                | 5.71% | 0.00% | 2.60% | 0.00% | -         | 3.58%              | 4.89% | 5.56%  | 2.60%  | 0.00% | -         |
| PID_5                        | Access to emergency services                             | 1.48%                | 6.02% | 0.00% | 0.00% | 0.00% | 1.50%     | 2.58%              | 1.93% | 5.56%  | 4.55%  | 0.00% | 2.92%     |
|                              | Access to appointments                                   | 0.37%                | 5.54% | 0.00% | 4.55% | 0.00% | 2.09%     | 2.21%              | 1.93% | 5.56%  | 0.00%  | 0.00% | 1.94%     |
|                              | Access to treatments                                     | 0.74%                | 5.78% | 0.00% | 0.00% | 0.00% | 1.30%     | 2.21%              | 1.20% | 5.56%  | 4.55%  | 0.00% | 2.70%     |
|                              | Access to surgeries                                      | 1.48%                | 6.02% | 0.00% | 0.00% | 0.00% | 1.50%     | 2.95%              | 1.45% | 5.56%  | 0.00%  | 0.00% | 1.99%     |
|                              | $\bar{X}$                                                | 1.01%                | 5.84% | 0.00% | 1.14% | 0.00% | -         | 2.49%              | 1.63% | 5.56%  | 2.27%  | 0.00% | -         |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 1.85%                | 7.23% | 0.00% | 4.55% | 0.00% | 2.72%     | 8.86%              | 5.78% | 11.11% | 4.55%  | 0.00% | 6.06%     |
|                              | Cost with medicines                                      | 1.85%                | 6.51% | 0.00% | 0.00% | 0.00% | 1.67%     | 7.38%              | 6.02% | 11.11% | 9.09%  | 0.00% | 6.72%     |
|                              | Cost with pharmaceutical products                        | 2.58%                | 6.75% | 0.00% | 0.00% | 0.00% | 1.87%     | 8.12%              | 5.78% | 11.11% | 4.55%  | 9.09% | 7.73%     |
|                              | Cost with medical consumables                            | 2.21%                | 7.95% | 0.00% | 0.00% | 0.00% | 2.03%     | 9.23%              | 6.75% | 11.11% | 4.55%  | 9.09% | 8.14%     |
|                              | Cost with laboratory consumables                         | 2.58%                | 7.95% | 0.00% | 0.00% | 0.00% | 2.11%     | 9.59%              | 6.99% | 11.11% | 9.09%  | 9.09% | 9.17%     |
|                              | Cost with human resources                                | 2.58%                | 7.71% | 0.00% | 0.00% | 0.00% | 2.06%     | 10.33%             | 7.47% | 11.11% | 13.64% | 9.09% | 10.33%    |
|                              | $\bar{X}$                                                | 2.28%                | 7.35% | 0.00% | 0.76% | 0.00% | -         | 8.92%              | 6.47% | 11.11% | 7.58%  | 6.06% | -         |
| PID_7                        | Average time of appointment                              | 2.58%                | 7.23% | 0.00% | 0.00% | 0.00% | 1.96%     | 6.27%              | 4.58% | 5.56%  | 0.00%  | 0.00% | 3.28%     |
|                              | Average time of treatment                                | 2.21%                | 6.75% | 0.00% | 0.00% | 0.00% | 1.79%     | 6.27%              | 4.34% | 5.56%  | 4.55%  | 0.00% | 4.14%     |
|                              | Average time of waiting                                  | 1.85%                | 7.23% | 0.00% | 0.00% | 0.00% | 1.81%     | 5.90%              | 4.34% | 5.56%  | 0.00%  | 0.00% | 3.16%     |
|                              | Average time of management and administration            | 1.85%                | 8.43% | 0.00% | 0.00% | 0.00% | 2.06%     | 7.38%              | 6.27% | 5.56%  | 9.09%  | 0.00% | 5.66%     |
|                              | $\bar{X}$                                                | 2.12%                | 7.41% | 0.00% | 0.00% | 0.00% | -         | 6.46%              | 4.88% | 5.56%  | 3.41%  | 0.00% | -         |

Table 54. (continued)

| Primary information category | Secondary information category | Moderately important |        |        |        |        |           |
|------------------------------|--------------------------------|----------------------|--------|--------|--------|--------|-----------|
|                              |                                | Hpro                 | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
| PID_1                        | Allergies and intolerances     | 2.58%                | 9.64%  | 11.11% | 9.09%  | 9.09%  | 8.30%     |
|                              | Demography                     | 19.93%               | 20.48% | 16.67% | 27.27% | 18.18% | 20.51%    |
|                              | Pregnancy                      | 7.01%                | 12.53% | 11.11% | 9.09%  | 18.18% | 11.59%    |
|                              | Habits                         | 8.86%                | 18.80% | 11.11% | 22.73% | 18.18% | 15.93%    |
|                              | Clinical and family history    | 5.54%                | 10.36% | 11.11% | 9.09%  | 18.18% | 10.86%    |
|                              | Identification                 | 5.17%                | 11.33% | 16.67% | 13.64% | 27.27% | 14.81%    |
|                              | Death                          | 11.07%               | 14.46% | 16.67% | 13.64% | 27.27% | 16.62%    |
|                              | Pathologies                    | 3.32%                | 8.67%  | 16.67% | 9.09%  | 18.18% | 11.19%    |
|                              | $\bar{X}$                      | 7.93%                | 13.28% | 13.89% | 14.20% | 19.32% | -         |
| PID_2                        | Anthropometric evaluation      | 10.70%               | 15.42% | 11.11% | 9.09%  | 18.18% | 12.90%    |
|                              | Laboratory tests               | 6.64%                | 7.23%  | 5.56%  | 9.09%  | 9.09%  | 7.52%     |
|                              | Imaging exams                  | 6.27%                | 8.43%  | 5.56%  | 9.09%  | 9.09%  | 7.69%     |

| Primary information category | Secondary information category                           | Moderately important |        |        |        |        |           |
|------------------------------|----------------------------------------------------------|----------------------|--------|--------|--------|--------|-----------|
|                              |                                                          | Hpro                 | Pati   | Admi   | Mana   | Pmkr   | $\bar{X}$ |
|                              | Rapid tests                                              | 12.55%               | 10.84% | 5.56%  | 9.09%  | 18.18% | 11.24%    |
|                              | Physical exams                                           | 9.23%                | 9.88%  | 5.56%  | 4.55%  | 18.18% | 9.48%     |
|                              | Electrocardiogram                                        | 7.01%                | 8.19%  | 5.56%  | 13.64% | 9.09%  | 8.70%     |
|                              | Vital parameters                                         | 6.64%                | 9.16%  | 5.56%  | 9.09%  | 9.09%  | 7.91%     |
|                              | $\bar{X}$                                                | 8.43%                | 9.88%  | 6.35%  | 9.09%  | 12.99% | -         |
|                              | Vaccination and immunization                             | 5.90%                | 8.19%  | 5.56%  | 0.00%  | 9.09%  | 5.75%     |
|                              | Screenings                                               | 8.86%                | 9.40%  | 5.56%  | 9.09%  | 18.18% | 10.22%    |
| PID_3                        | Diet                                                     | 11.44%               | 15.42% | 5.56%  | 4.55%  | 18.18% | 11.03%    |
|                              | Physical activity                                        | 11.07%               | 16.87% | 5.56%  | 9.09%  | 9.09%  | 10.33%    |
|                              | Antimicrobial resistance                                 | 8.49%                | 9.64%  | 5.56%  | 4.55%  | 9.09%  | 7.46%     |
|                              | Smoking                                                  | 11.07%               | 13.73% | 5.56%  | 4.55%  | 9.09%  | 8.80%     |
|                              | Epidemiology                                             | 11.44%               | 12.05% | 5.56%  | 9.09%  | 18.18% | 11.26%    |
|                              | $\bar{X}$                                                | 9.75%                | 12.19% | 5.56%  | 5.84%  | 12.99% | -         |
| PID_4                        | Medicines                                                | 5.54%                | 7.71%  | 5.56%  | 0.00%  | 9.09%  | 5.58%     |
|                              | Pharmaceutical products                                  | 11.81%               | 12.77% | 5.56%  | 4.55%  | 18.18% | 10.57%    |
|                              | Medical consumables                                      | 17.34%               | 15.66% | 16.67% | 4.55%  | 18.18% | 14.48%    |
|                              | Laboratory consumables                                   | 17.71%               | 15.90% | 11.11% | 4.55%  | 18.18% | 13.49%    |
|                              | Drug interactions                                        | 6.64%                | 11.33% | 5.56%  | 4.55%  | 9.09%  | 7.43%     |
|                              | Dosage                                                   | 6.64%                | 10.12% | 5.56%  | 4.55%  | 9.09%  | 7.19%     |
|                              | Technical information about healthcare technologies      | 14.39%               | 13.49% | 5.56%  | 4.55%  | 9.09%  | 9.42%     |
|                              | $\bar{X}$                                                | 11.44%               | 12.43% | 7.94%  | 3.90%  | 12.99% | -         |
| PID_5                        | Access to emergency services                             | 7.38%                | 10.84% | 5.56%  | 9.09%  | 9.09%  | 8.39%     |
|                              | Access to appointments                                   | 8.49%                | 9.88%  | 5.56%  | 4.55%  | 9.09%  | 7.51%     |
|                              | Access to treatments                                     | 9.59%                | 10.12% | 5.56%  | 4.55%  | 9.09%  | 7.78%     |
|                              | Access to surgeries                                      | 9.96%                | 9.64%  | 5.56%  | 4.55%  | 9.09%  | 7.76%     |
|                              | $\bar{X}$                                                | 8.86%                | 10.12% | 5.56%  | 5.68%  | 9.09%  | -         |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 22.14%               | 17.59% | 5.56%  | 18.18% | 9.09%  | 14.51%    |
|                              | Cost with medicines                                      | 20.30%               | 15.18% | 5.56%  | 13.64% | 9.09%  | 12.75%    |
|                              | Cost with pharmaceutical products                        | 22.88%               | 17.83% | 5.56%  | 18.18% | 9.09%  | 14.71%    |
|                              | Cost with medical consumables                            | 24.72%               | 19.76% | 5.56%  | 22.73% | 18.18% | 18.19%    |
|                              | Cost with laboratory consumables                         | 24.35%               | 19.76% | 5.56%  | 18.18% | 18.18% | 17.21%    |
|                              | Cost with human resources                                | 21.77%               | 19.52% | 5.56%  | 13.64% | 27.27% | 17.55%    |
|                              | $\bar{X}$                                                | 22.69%               | 18.27% | 5.56%  | 17.42% | 15.15% | -         |
| PID_7                        | Average time of appointment                              | 20.30%               | 16.39% | 5.56%  | 9.09%  | 0.00%  | 10.27%    |
|                              | Average time of treatment                                | 18.82%               | 14.70% | 5.56%  | 9.09%  | 0.00%  | 9.63%     |
|                              | Average time of waiting                                  | 18.45%               | 14.70% | 11.11% | 18.18% | 0.00%  | 12.49%    |
|                              | Average time of management and administration            | 21.03%               | 16.63% | 16.67% | 13.64% | 0.00%  | 13.59%    |
|                              | $\bar{X}$                                                | 19.65%               | 15.60% | 9.72%  | 12.50% | 0.00%  | -         |

Table 54. (continued)

| Primary information category                        | Secondary information category | Important |       |       |       |       |           | Very important |       |       |       |       |           |
|-----------------------------------------------------|--------------------------------|-----------|-------|-------|-------|-------|-----------|----------------|-------|-------|-------|-------|-----------|
|                                                     |                                | Hpro      | Pati  | Admi  | Mana  | Pmkr  | $\bar{X}$ | Hpro           | Pati  | Admi  | Mana  | Pmkr  | $\bar{X}$ |
| PID_1                                               | Allergies and intolerances     | 21.40     | 28.92 | 38.89 | 22.73 | 45.45 | 31.48     | 74.17          | 53.25 | 50.00 | 63.64 | 45.45 | 57.30     |
|                                                     | Demography                     | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 45.02     | 37.59 | 55.56 | 45.45 | 36.36 | 44.00     | 26.57          | 26.75 | 27.78 | 22.73 | 36.36 | 28.04     |
|                                                     | Pregnancy                      | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 30.63     | 33.73 | 33.33 | 31.82 | 45.45 | 34.99     | 60.89          | 43.86 | 55.56 | 50.00 | 36.36 | 49.33     |
|                                                     | Habits                         | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 36.90     | 39.76 | 38.89 | 27.27 | 45.45 | 37.66     | 52.77          | 31.33 | 50.00 | 45.45 | 36.36 | 43.18     |
|                                                     | Clinical and family history    | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 31.73     | 31.81 | 33.33 | 31.82 | 36.36 | 33.01     | 61.99          | 49.88 | 55.56 | 54.55 | 45.45 | 53.49     |
|                                                     | Identification                 | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
| 30.26                                               |                                | 37.11     | 33.33 | 22.73 | 45.45 | 33.78 | 63.47     | 40.96          | 50.00 | 59.09 | 27.27 | 48.16 |           |
| Death                                               | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
|                                                     | 35.42                          | 37.83     | 33.33 | 31.82 | 27.27 | 33.14 | 47.60     | 34.94          | 50.00 | 45.45 | 36.36 | 42.87 |           |
|                                                     | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
| Pathologies                                         | 22.14                          | 30.36     | 33.33 | 22.73 | 36.36 | 28.99 | 73.80     | 52.53          | 50.00 | 63.64 | 45.45 | 57.08 |           |
|                                                     | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
| $\bar{X}$                                           |                                | 31.69     | 34.64 | 37.50 | 29.55 | 39.77 | -         | 57.66          | 41.69 | 48.61 | 50.57 | 38.64 | -         |
|                                                     |                                | %         | %     | %     | %     | %     |           | %              | %     | %     | %     | %     |           |
| PID_2                                               | Anthropometric evaluation      | 41.33     | 40.00 | 55.56 | 36.36 | 36.36 | 41.92     | 42.07          | 32.29 | 27.78 | 50.00 | 45.45 | 39.52     |
|                                                     | Laboratory tests               | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 32.10     | 35.90 | 44.44 | 40.91 | 27.27 | 36.13     | 58.30          | 48.43 | 44.44 | 50.00 | 63.64 | 52.96     |
|                                                     | Imaging exams                  | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 31.73     | 34.22 | 44.44 | 45.45 | 27.27 | 36.62     | 58.67          | 49.16 | 44.44 | 45.45 | 63.64 | 52.27     |
|                                                     | Rapid tests                    | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 41.70     | 39.04 | 55.56 | 45.45 | 27.27 | 41.80     | 41.70          | 40.96 | 33.33 | 45.45 | 54.55 | 43.20     |
|                                                     | Physical exams                 | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 38.75     | 39.28 | 55.56 | 59.09 | 36.36 | 45.81     | 47.60          | 42.41 | 33.33 | 36.36 | 45.45 | 41.03     |
|                                                     | Electrocardiogram              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
| 38.38                                               |                                | 36.63     | 38.89 | 40.91 | 27.27 | 36.41 | 48.34     | 47.47          | 50.00 | 45.45 | 63.64 | 50.98 |           |
| Vital parameters                                    | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
|                                                     | 33.21                          | 36.14     | 50.00 | 31.82 | 27.27 | 35.69 | 56.46     | 46.75          | 38.89 | 59.09 | 63.64 | 52.96 |           |
|                                                     | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
| $\bar{X}$                                           |                                | 36.74     | 37.31 | 49.21 | 42.86 | 29.87 | -         | 50.45          | 43.92 | 38.89 | 47.40 | 57.14 | -         |
|                                                     |                                | %         | %     | %     | %     | %     |           | %              | %     | %     | %     | %     |           |
| PID_3                                               | Vaccination and immunization   | 31.37     | 32.77 | 44.44 | 22.73 | 36.36 | 33.53     | 60.52          | 50.60 | 44.44 | 72.73 | 54.55 | 56.57     |
|                                                     | Screenings                     | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 37.64     | 32.77 | 50.00 | 45.45 | 36.36 | 40.45     | 50.92          | 49.64 | 38.89 | 45.45 | 45.45 | 46.07     |
|                                                     | Diet                           | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 36.90     | 42.41 | 50.00 | 54.55 | 27.27 | 42.23     | 47.60          | 32.29 | 38.89 | 40.91 | 45.45 | 41.03     |
|                                                     | Physical activity              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 40.96     | 40.48 | 55.56 | 59.09 | 36.36 | 46.49     | 43.17          | 32.05 | 33.33 | 31.82 | 45.45 | 37.17     |
|                                                     | Antimicrobial resistance       | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 32.10     | 34.94 | 44.44 | 40.91 | 27.27 | 35.93     | 57.20          | 45.30 | 44.44 | 54.55 | 63.64 | 53.02     |
|                                                     | Smoking                        | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
| 35.79                                               |                                | 41.20     | 38.89 | 50.00 | 36.36 | 40.45 | 50.55     | 34.70          | 50.00 | 36.36 | 54.55 | 45.23 |           |
| Epidemiology                                        | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
|                                                     | 38.01                          | 35.42     | 50.00 | 63.64 | 36.36 | 44.69 | 45.02     | 44.34          | 38.89 | 27.27 | 45.45 | 40.19 |           |
|                                                     | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
| $\bar{X}$                                           |                                | 36.11     | 37.14 | 47.62 | 48.05 | 33.77 | -         | 50.71          | 41.27 | 41.27 | 44.16 | 50.65 | -         |
|                                                     |                                | %         | %     | %     | %     | %     |           | %              | %     | %     | %     | %     |           |
| PID_4                                               | Medicines                      | 26.94     | 32.05 | 33.33 | 27.27 | 36.36 | 31.19     | 66.42          | 52.05 | 55.56 | 68.18 | 54.55 | 59.35     |
|                                                     | Pharmaceutical products        | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 35.42     | 37.35 | 50.00 | 45.45 | 36.36 | 40.92     | 50.18          | 40.48 | 38.89 | 45.45 | 45.45 | 44.09     |
|                                                     | Medical consumables            | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 38.75     | 39.28 | 44.44 | 54.55 | 36.36 | 42.68     | 37.27          | 32.05 | 33.33 | 36.36 | 45.45 | 36.89     |
|                                                     | Laboratory consumables         | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 38.38     | 39.04 | 44.44 | 54.55 | 36.36 | 42.55     | 35.79          | 31.81 | 38.89 | 36.36 | 45.45 | 37.66     |
|                                                     | Drug interactions              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 29.89     | 35.66 | 44.44 | 36.36 | 45.45 | 38.36     | 60.52          | 43.61 | 44.44 | 54.55 | 45.45 | 49.72     |
|                                                     | Dosage                         | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
| 29.15                                               |                                | 34.22     | 44.44 | 45.45 | 45.45 | 39.74 | 60.89     | 46.99          | 44.44 | 45.45 | 45.45 | 48.65 |           |
| Technical information about healthcare technologies | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
|                                                     | 38.38                          | 36.87     | 50.00 | 50.00 | 45.45 | 44.14 | 42.44     | 37.35          | 38.89 | 36.36 | 45.45 | 40.10 |           |
|                                                     | %                              | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     |           |
| $\bar{X}$                                           |                                | 33.84     | 36.35 | 44.44 | 44.81 | 40.26 | -         | 50.50          | 40.62 | 42.06 | 46.10 | 46.75 | -         |
|                                                     |                                | %         | %     | %     | %     | %     |           | %              | %     | %     | %     | %     |           |
| PID_5                                               | Access to emergency services   | 40.22     | 31.08 | 27.78 | 31.82 | 45.45 | 35.27     | 48.34          | 50.12 | 61.11 | 54.55 | 45.45 | 51.91     |
|                                                     | Access to appointments         | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |
|                                                     |                                | 39.48     | 33.73 | 27.78 | 54.55 | 45.45 | 40.20     | 49.45          | 48.92 | 61.11 | 36.36 | 45.45 | 48.26     |
|                                                     |                                | %         | %     | %     | %     | %     | %         | %              | %     | %     | %     | %     | %         |

|       |                                                          |            |            |            |            |            |            |            |            |            |            |            |            |
|-------|----------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|       | Access to treatments                                     | 39.85<br>% | 33.25<br>% | 27.78<br>% | 50.00<br>% | 45.45<br>% | 39.27<br>% | 47.60<br>% | 49.64<br>% | 61.11<br>% | 40.91<br>% | 45.45<br>% | 48.94<br>% |
|       | Access to surgeries                                      | 38.38<br>% | 33.49<br>% | 27.78<br>% | 40.91<br>% | 45.45<br>% | 37.20<br>% | 47.23<br>% | 49.40<br>% | 61.11<br>% | 54.55<br>% | 45.45<br>% | 51.55<br>% |
|       | $\bar{X}$                                                | 39.48<br>% | 32.89<br>% | 27.78<br>% | 44.32<br>% | 45.45<br>% | -          | 48.15<br>% | 49.52<br>% | 61.11<br>% | 46.59<br>% | 45.45<br>% | -          |
| PID_6 | Cost with complementary diagnostic and therapeutic exams | 33.58<br>% | 36.63<br>% | 33.33<br>% | 31.82<br>% | 45.45<br>% | 36.16<br>% | 33.58<br>% | 32.77<br>% | 50.00<br>% | 40.91<br>% | 45.45<br>% | 40.54<br>% |
|       | Cost with medicines                                      | 36.90<br>% | 37.11<br>% | 33.33<br>% | 22.73<br>% | 54.55<br>% | 36.92<br>% | 33.58<br>% | 35.18<br>% | 50.00<br>% | 54.55<br>% | 36.36<br>% | 41.93<br>% |
|       | Cost with pharmaceutical products                        | 35.06<br>% | 38.55<br>% | 33.33<br>% | 40.91<br>% | 54.55<br>% | 40.48<br>% | 31.37<br>% | 31.08<br>% | 50.00<br>% | 36.36<br>% | 27.27<br>% | 35.22<br>% |
|       | Cost with medical consumables                            | 34.69<br>% | 37.59<br>% | 55.56<br>% | 36.36<br>% | 54.55<br>% | 43.75<br>% | 29.15<br>% | 27.95<br>% | 27.78<br>% | 36.36<br>% | 18.18<br>% | 27.89<br>% |
|       | Cost with laboratory consumables                         | 35.06<br>% | 37.83<br>% | 44.44<br>% | 40.91<br>% | 45.45<br>% | 40.74<br>% | 28.41<br>% | 27.47<br>% | 38.89<br>% | 31.82<br>% | 27.27<br>% | 30.77<br>% |
|       | Cost with human resources                                | 35.42<br>% | 35.18<br>% | 44.44<br>% | 18.18<br>% | 36.36<br>% | 33.92<br>% | 29.89<br>% | 30.12<br>% | 38.89<br>% | 54.55<br>% | 27.27<br>% | 36.14<br>% |
|       | $\bar{X}$                                                | 35.12<br>% | 37.15<br>% | 40.74<br>% | 31.82<br>% | 48.48<br>% | -          | 31.00<br>% | 30.76<br>% | 42.59<br>% | 42.42<br>% | 30.30<br>% | -          |
| PID_7 | Average time of appointment                              | 41.70<br>% | 36.39<br>% | 38.89<br>% | 54.55<br>% | 45.45<br>% | 43.39<br>% | 29.15<br>% | 35.42<br>% | 50.00<br>% | 36.36<br>% | 54.55<br>% | 41.10<br>% |
|       | Average time of treatment                                | 43.91<br>% | 37.59<br>% | 38.89<br>% | 54.55<br>% | 45.45<br>% | 44.08<br>% | 28.78<br>% | 36.63<br>% | 50.00<br>% | 31.82<br>% | 54.55<br>% | 40.35<br>% |
|       | Average time of waiting                                  | 42.07<br>% | 35.90<br>% | 27.78<br>% | 36.36<br>% | 45.45<br>% | 37.51<br>% | 31.73<br>% | 37.83<br>% | 55.56<br>% | 45.45<br>% | 54.55<br>% | 45.02<br>% |
|       | Average time of management and administration            | 42.44<br>% | 35.90<br>% | 27.78<br>% | 45.45<br>% | 36.36<br>% | 37.59<br>% | 27.31<br>% | 32.77<br>% | 50.00<br>% | 31.82<br>% | 63.64<br>% | 41.11<br>% |
|       | $\bar{X}$                                                | 42.53<br>% | 36.45<br>% | 33.33<br>% | 47.73<br>% | 43.18<br>% | -          | 29.24<br>% | 35.66<br>% | 51.39<br>% | 36.36<br>% | 56.82<br>% | -          |

## Annex XXIII – Healthcare professionals' perspectives about healthcare data importance: standard deviation

Table 55. Healthcare professionals' perspectives about healthcare data importance: standard deviation

| Primary information category | Secondary information category                      | Standard deviation |      |      |      |      |      |      |           |
|------------------------------|-----------------------------------------------------|--------------------|------|------|------|------|------|------|-----------|
|                              |                                                     | Phar               | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |
| PID_1 <sup>a)</sup>          | Allergies and intolerances                          | 0.48               | 0.58 | 0.57 | 0.71 | 1.28 | 0.83 | 0.48 | 0.71      |
|                              | Demography                                          | 0.92               | 0.87 | 0.96 | 0.93 | 1.15 | 1.06 | 0.74 | 0.95      |
|                              | Pregnancy                                           | 0.60               | 0.64 | 0.65 | 0.67 | 0.79 | 1.28 | 0.71 | 0.76      |
|                              | Habits                                              | 0.75               | 0.70 | 0.73 | 0.51 | 0.75 | 1.13 | 0.48 | 0.72      |
|                              | Clinical and family history                         | 0.56               | 0.71 | 0.64 | 0.67 | 0.52 | 0.63 | 0.52 | 0.61      |
|                              | Identification                                      | 0.77               | 0.55 | 0.60 | 0.84 | 0.52 | 0.80 | 0.48 | 0.65      |
|                              | Death                                               | 0.95               | 0.82 | 0.92 | 1.00 | 1.11 | 0.99 | 0.79 | 0.94      |
|                              | Pathologies                                         | 0.53               | 0.52 | 0.61 | 0.44 | 1.19 | 0.74 | 0.48 | 0.65      |
|                              | $\bar{X}$                                           | 0.70               | 0.67 | 0.71 | 0.72 | 0.92 | 0.93 | 0.59 | -         |
| PID_2 <sup>a)</sup>          | Anthropometric evaluation                           | 0.89               | 0.78 | 0.81 | 1.00 | 1.24 | 0.88 | 0.48 | 0.87      |
|                              | Laboratory tests                                    | 0.81               | 0.64 | 0.66 | 0.86 | 1.31 | 0.82 | 0.48 | 0.80      |
|                              | Imaging exams                                       | 0.94               | 0.54 | 0.71 | 0.67 | 1.31 | 0.82 | 0.88 | 0.84      |
|                              | Rapid tests                                         | 0.87               | 0.71 | 0.77 | 1.00 | 1.06 | 0.92 | 0.88 | 0.88      |
|                              | Physical exams                                      | 0.91               | 0.72 | 0.77 | 0.95 | 1.03 | 0.92 | 0.67 | 0.85      |
|                              | Electrocardiogram                                   | 0.95               | 0.71 | 0.72 | 1.12 | 1.30 | 0.96 | 1.06 | 0.97      |
|                              | Vital parameters                                    | 0.88               | 0.65 | 0.69 | 0.81 | 1.30 | 0.83 | 0.92 | 0.87      |
|                              | $\bar{X}$                                           | 0.90               | 0.68 | 0.73 | 0.92 | 1.22 | 0.88 | 0.77 | -         |
| PID_3 <sup>a)</sup>          | Vaccination and immunization                        | 0.55               | 0.57 | 0.61 | 0.83 | 0.83 | 1.07 | 0.88 | 0.76      |
|                              | Screenings                                          | 0.63               | 0.60 | 0.77 | 0.86 | 0.90 | 0.98 | 0.79 | 0.79      |
|                              | Diet                                                | 0.75               | 0.88 | 0.77 | 0.80 | 1.11 | 1.10 | 0.48 | 0.84      |
|                              | Physical activity                                   | 0.71               | 0.88 | 0.84 | 0.77 | 1.11 | 1.19 | 0.53 | 0.86      |
|                              | Antimicrobial resistance                            | 0.55               | 0.73 | 0.58 | 0.85 | 1.27 | 1.01 | 0.99 | 0.85      |
|                              | Smoking                                             | 0.65               | 0.73 | 0.73 | 0.82 | 1.15 | 1.10 | 0.71 | 0.84      |
|                              | Epidemiology                                        | 0.65               | 0.89 | 0.88 | 0.79 | 1.19 | 1.25 | 0.67 | 0.90      |
|                              | $\bar{X}$                                           | 0.64               | 0.76 | 0.74 | 0.82 | 1.08 | 1.10 | 0.72 | -         |
| PID_4 <sup>a)</sup>          | Medicines                                           | 0.68               | 0.49 | 0.58 | 0.80 | 0.75 | 0.94 | 0.52 | 0.68      |
|                              | Pharmaceutical products                             | 0.76               | 0.67 | 0.76 | 0.77 | 0.94 | 1.13 | 0.94 | 0.85      |
|                              | Medical consumables                                 | 0.91               | 0.81 | 0.81 | 0.88 | 1.24 | 1.41 | 0.82 | 0.98      |
|                              | Laboratory consumables                              | 0.91               | 0.90 | 0.85 | 0.86 | 1.23 | 1.36 | 1.17 | 1.04      |
|                              | Drug interactions                                   | 0.64               | 0.59 | 0.69 | 0.85 | 1.28 | 1.01 | 1.20 | 0.89      |
|                              | Dosage                                              | 0.68               | 0.56 | 0.63 | 0.83 | 1.27 | 1.36 | 0.79 | 0.87      |
|                              | Technical information about healthcare technologies | 0.74               | 0.90 | 0.78 | 0.61 | 1.17 | 1.36 | 0.92 | 0.93      |

| Primary information category | Secondary information category                           | Standard deviation |      |      |      |      |      |      |           |
|------------------------------|----------------------------------------------------------|--------------------|------|------|------|------|------|------|-----------|
|                              |                                                          | Phar               | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr | $\bar{X}$ |
|                              | $\bar{X}$                                                | 0.76               | 0.70 | 0.73 | 0.80 | 1.13 | 1.22 | 0.91 | -         |
| PID_5 <sup>a)</sup>          | Access to emergency services                             | 0.85               | 0.79 | 0.75 | 0.95 | 1.08 | 0.74 | 0.88 | 0.86      |
|                              | Access to appointments                                   | 0.87               | 0.80 | 0.60 | 0.93 | 0.45 | 0.68 | 0.94 | 0.75      |
|                              | Access to treatments                                     | 0.79               | 0.79 | 0.62 | 0.90 | 1.13 | 0.93 | 0.92 | 0.87      |
|                              | Access to surgeries                                      | 0.80               | 0.83 | 0.80 | 0.98 | 1.11 | 0.88 | 0.92 | 0.90      |
|                              | $\bar{X}$                                                | 0.83               | 0.80 | 0.69 | 0.94 | 0.94 | 0.81 | 0.91 | -         |
| PID_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 0.77               | 1.11 | 1.00 | 0.95 | 1.40 | 1.18 | 1.07 | 1.07      |
|                              | Cost with medicines                                      | 0.78               | 1.03 | 0.97 | 0.95 | 1.36 | 1.12 | 1.07 | 1.04      |
|                              | Cost with pharmaceutical products                        | 0.79               | 1.08 | 0.98 | 0.98 | 1.40 | 1.30 | 1.25 | 1.11      |
|                              | Cost with medical consumables                            | 0.81               | 1.08 | 0.99 | 1.01 | 1.40 | 1.12 | 1.25 | 1.10      |
|                              | Cost with laboratory consumables                         | 0.83               | 1.12 | 0.98 | 1.05 | 1.40 | 1.12 | 1.25 | 1.11      |
|                              | Cost with human resources                                | 0.83               | 1.12 | 1.00 | 1.01 | 1.40 | 1.19 | 1.32 | 1.12      |
|                              | $\bar{X}$                                                | 0.80               | 1.09 | 0.99 | 0.99 | 1.40 | 1.17 | 1.20 | -         |
| PID_7 <sup>a)</sup>          | Average time of appointment                              | 0.93               | 1.04 | 0.84 | 1.22 | 1.00 | 1.12 | 0.99 | 1.02      |
|                              | Average time of treatment                                | 0.88               | 0.97 | 0.84 | 1.11 | 1.07 | 1.19 | 1.14 | 1.03      |
|                              | Average time of waiting                                  | 0.93               | 1.02 | 0.83 | 1.01 | 1.06 | 1.06 | 1.05 | 0.99      |
|                              | Average time of management and administration            | 0.91               | 1.03 | 0.84 | 1.01 | 1.06 | 1.12 | 1.17 | 1.02      |
|                              | $\bar{X}$                                                | 0.92               | 1.02 | 0.84 | 1.09 | 1.04 | 1.12 | 1.09 | -         |

a) 5-Likert importance scale: 1 - Not important at all; 2 - Not very important; 3 - Moderately important; 4 - Important; 5 - Very important

## Annex XXIV – Healthcare professionals' perspectives about healthcare data: importance analysis (%)

Table 56. Healthcare professionals' perspectives about healthcare data: importance analysis (%)

| Primary information category | Secondary information category | Not important at all |      |      |      |      |      |       |           | Not very important |      |      |       |       |       |       |           |
|------------------------------|--------------------------------|----------------------|------|------|------|------|------|-------|-----------|--------------------|------|------|-------|-------|-------|-------|-----------|
|                              |                                | Phar                 | Phys | Nurs | Sdtt | Psyc | Sht  | Nutr  | $\bar{X}$ | Phar               | Phys | Nurs | Sdtt  | Psyc  | Sht   | Nutr  | $\bar{X}$ |
| PID_1                        | Allergies and intolerances     | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 0.00               | 1.72 | 0.00 | 3.13  | 8.33  | 0.00  | 0.00  | 1.88      |
|                              | Demography                     | 0.00                 | 0.00 | 2.83 | 0.00 | 8.33 | 6.67 | 0.00  | 2.55      | 10.53              | 5.17 | 4.72 | 12.50 | 0.00  | 13.33 | 0.00  | 6.61      |
|                              | Pregnancy                      | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 6.67 | 0.00  | 0.95      | 0.00               | 1.72 | 0.94 | 0.00  | 0.00  | 6.67  | 0.00  | 1.33      |
|                              | Habits                         | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 6.67 | 0.00  | 0.95      | 0.00               | 1.72 | 1.89 | 0.00  | 0.00  | 0.00  | 0.00  | 0.52      |
|                              | Clinical and family history    | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00      | 0.00               | 1.72 | 0.94 | 0.00  | 0.00  | 0.00  | 0.00  | 0.38      |
|                              | Identification                 | 0.00                 | 0.00 | 0.00 | 3.13 | 0.00 | 0.00 | 0.00  | 0.45      | 2.63               | 0.00 | 0.94 | 0.00  | 0.00  | 0.00  | 0.00  | 0.51      |
|                              | Death                          | 2.63                 | 1.72 | 0.94 | 3.13 | 8.33 | 0.00 | 0.00  | 2.39      | 2.63               | 1.72 | 5.66 | 6.25  | 0.00  | 6.67  | 0.00  | 3.28      |
|                              | Pathologies                    | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 0.00               | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00      |
|                              | $\bar{X}$                      | 0.33                 | 0.22 | 0.71 | 0.78 | 4.17 | 2.50 | 0.00  | -         | 1.97               | 1.72 | 1.89 | 2.73  | 1.04  | 3.33  | 0.00  | -         |
| PID_2                        | Anthropometric evaluation      | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 7.89               | 3.45 | 2.83 | 12.50 | 8.33  | 6.67  | 0.00  | 5.95      |
|                              | Laboratory tests               | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 2.63               | 1.72 | 0.00 | 6.25  | 16.67 | 0.00  | 0.00  | 3.90      |
|                              | Imaging exams                  | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 7.89               | 0.00 | 0.94 | 3.13  | 16.67 | 0.00  | 0.00  | 4.09      |
|                              | Rapid tests                    | 0.00                 | 0.00 | 0.94 | 3.13 | 0.00 | 0.00 | 0.00  | 0.58      | 5.26               | 1.72 | 0.94 | 6.25  | 16.67 | 6.67  | 0.00  | 5.36      |
|                              | Physical exams                 | 0.00                 | 0.00 | 0.94 | 3.13 | 0.00 | 0.00 | 0.00  | 0.58      | 7.89               | 1.72 | 1.89 | 3.13  | 16.67 | 6.67  | 0.00  | 5.42      |
|                              | Electrocardiogram              | 0.00                 | 0.00 | 0.94 | 3.13 | 8.33 | 0.00 | 0.00  | 1.77      | 10.53              | 1.72 | 0.94 | 12.50 | 16.67 | 6.67  | 10.00 | 8.43      |
|                              | Vital parameters               | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 5.26               | 1.72 | 0.00 | 6.25  | 16.67 | 0.00  | 10.00 | 5.70      |
|                              | $\bar{X}$                      | 0.00                 | 0.00 | 0.94 | 1.34 | 5.95 | 0.00 | 0.00  | -         | 6.77               | 1.72 | 1.08 | 7.14  | 15.48 | 3.81  | 2.86  | -         |
| PID_3                        | Vaccination and immunization   | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00      | 0.00               | 0.00 | 0.94 | 6.25  | 8.33  | 13.33 | 0.00  | 4.12      |
|                              | Screenings                     | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00      | 0.00               | 0.00 | 0.94 | 6.25  | 8.33  | 13.33 | 0.00  | 4.12      |
|                              | Diet                           | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 0.00 | 0.00  | 1.19      | 0.00               | 6.90 | 2.83 | 3.13  | 0.00  | 13.33 | 0.00  | 3.74      |
|                              | Physical activity              | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 0.00               | 6.90 | 2.83 | 3.13  | 0.00  | 20.00 | 0.00  | 4.69      |
|                              | Antimicrobial resistance       | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 0.00 | 0.00  | 1.19      | 0.00               | 1.72 | 0.00 | 3.13  | 8.33  | 6.67  | 10.00 | 4.26      |
|                              | Smoking                        | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 0.00 | 0.00  | 1.19      | 0.00               | 1.72 | 1.89 | 3.13  | 0.00  | 13.33 | 0.00  | 2.87      |
|                              | Epidemiology                   | 0.00                 | 0.00 | 0.94 | 0.00 | 8.33 | 0.00 | 0.00  | 1.33      | 0.00               | 5.17 | 4.72 | 3.13  | 8.33  | 20.00 | 0.00  | 5.91      |
|                              | $\bar{X}$                      | 0.00                 | 0.00 | 0.27 | 0.00 | 5.95 | 0.00 | 0.00  | -         | 0.00               | 3.20 | 2.02 | 4.02  | 4.76  | 14.29 | 1.43  | -         |
| PID_4                        | Medicines                      | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00      | 2.63               | 0.00 | 0.00 | 3.13  | 0.00  | 6.67  | 0.00  | 1.77      |
|                              | Pharmaceutical products        | 0.00                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00      | 2.63               | 0.00 | 0.94 | 3.13  | 8.33  | 13.33 | 10.00 | 5.48      |
|                              | Medical consumables            | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 6.67 | 0.00  | 2.14      | 7.89               | 3.45 | 1.89 | 9.38  | 16.67 | 20.00 | 10.00 | 9.90      |
|                              | Laboratory consumables         | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 6.67 | 10.00 | 3.57      | 7.89               | 5.17 | 3.77 | 9.38  | 16.67 | 20.00 | 10.00 | 10.41     |
|                              | Drug interactions              | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 0.00 | 10.00 | 2.62      | 2.63               | 0.00 | 0.94 | 6.25  | 8.33  | 6.67  | 0.00  | 3.55      |
|                              | Dosage                         | 0.00                 | 0.00 | 0.00 | 0.00 | 8.33 | 6.67 | 0.00  | 2.14      | 2.63               | 0.00 | 0.00 | 6.25  | 8.33  | 20.00 | 0.00  | 5.32      |
|                              | Technical information about    | 0.00                 | 1.72 | 0.00 | 0.00 | 8.33 | 6.67 | 0.00  | 2.39      | 2.63               | 3.45 | 1.89 | 0.00  | 8.33  | 20.00 | 10.00 | 6.61      |

| Primary information category | Secondary information category                           | Not important at all |        |        |        |         |         |         |           | Not very important |         |        |         |         |         |         |           |
|------------------------------|----------------------------------------------------------|----------------------|--------|--------|--------|---------|---------|---------|-----------|--------------------|---------|--------|---------|---------|---------|---------|-----------|
|                              |                                                          | Phar                 | Phys   | Nurs   | Sdtt   | Psyc    | Sht     | Nutr    | $\bar{X}$ | Phar               | Phys    | Nurs   | Sdtt    | Psyc    | Sht     | Nutr    | $\bar{X}$ |
|                              | healthcare technologies                                  |                      |        |        |        |         |         |         |           |                    |         |        |         |         |         |         |           |
|                              | $\bar{X}$                                                | 0.00 %               | 0.25 % | 0.00 % | 0.00 % | 5.95 %  | 3.81 %  | 2.86 %  | -         | 4.14 %             | 1.72 %  | 1.35 % | 5.36 %  | 9.52 %  | 15.24 % | 5.71 %  | -         |
| PID_5                        | Access to emergency services                             | 0.00 %               | 0.00 % | 1.89 % | 3.13 % | 8.33 %  | 0.00 %  | 0.00 %  | 1.91 %    | 5.26 %             | 3.45 %  | 0.00 % | 6.25 %  | 0.00 %  | 0.00 %  | 10.00 % | 3.57 %    |
|                              | Access to appointments                                   | 0.00 %               | 0.00 % | 0.00 % | 3.13 % | 0.00 %  | 0.00 %  | 0.00 %  | 0.45 %    | 5.26 %             | 3.45 %  | 0.00 % | 3.13 %  | 0.00 %  | 0.00 %  | 10.00 % | 3.12 %    |
|                              | Access to treatments                                     | 0.00 %               | 0.00 % | 0.00 % | 3.13 % | 8.33 %  | 0.00 %  | 0.00 %  | 1.64 %    | 2.63 %             | 3.45 %  | 0.00 % | 3.13 %  | 0.00 %  | 6.67 %  | 10.00 % | 3.70 %    |
|                              | Access to surgeries                                      | 0.00 %               | 0.00 % | 1.89 % | 3.13 % | 8.33 %  | 0.00 %  | 0.00 %  | 1.91 %    | 2.63 %             | 3.45 %  | 0.94 % | 6.25 %  | 0.00 %  | 6.67 %  | 10.00 % | 4.28 %    |
|                              | $\bar{X}$                                                | 0.00 %               | 0.00 % | 0.94 % | 3.13 % | 6.25 %  | 0.00 %  | 0.00 %  | -         | 3.95 %             | 3.45 %  | 0.24 % | 4.69 %  | 0.00 %  | 3.33 %  | 10.00 % | -         |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 0.00 %               | 1.72 % | 0.94 % | 0.00 % | 16.67 % | 6.67 %  | 0.00 %  | 3.71 %    | 2.63 %             | 10.34 % | 8.49 % | 9.38 %  | 16.67 % | 6.67 %  | 20.00 % | 10.60 %   |
|                              | Cost with medicines                                      | 0.00 %               | 1.72 % | 0.94 % | 0.00 % | 16.67 % | 6.67 %  | 0.00 %  | 3.71 %    | 2.63 %             | 6.90 %  | 7.55 % | 9.38 %  | 8.33 %  | 6.67 %  | 20.00 % | 8.78 %    |
|                              | Cost with pharmaceutical products                        | 0.00 %               | 1.72 % | 0.94 % | 0.00 % | 16.67 % | 13.33 % | 10.00 % | 6.10 %    | 2.63 %             | 8.62 %  | 7.55 % | 12.50 % | 16.67 % | 6.67 %  | 10.00 % | 9.23 %    |
|                              | Cost with medical consumables                            | 0.00 %               | 1.72 % | 0.94 % | 0.00 % | 16.67 % | 6.67 %  | 10.00 % | 5.14 %    | 5.26 %             | 8.62 %  | 8.49 % | 15.63 % | 16.67 % | 6.67 %  | 10.00 % | 10.19 %   |
|                              | Cost with laboratory consumables                         | 0.00 %               | 3.45 % | 0.94 % | 0.00 % | 16.67 % | 6.67 %  | 10.00 % | 5.39 %    | 5.26 %             | 8.62 %  | 8.49 % | 18.75 % | 16.67 % | 6.67 %  | 10.00 % | 10.64 %   |
|                              | Cost with human resources                                | 0.00 %               | 3.45 % | 0.94 % | 0.00 % | 16.67 % | 6.67 %  | 10.00 % | 5.39 %    | 7.89 %             | 8.62 %  | 8.49 % | 15.63 % | 16.67 % | 13.33 % | 20.00 % | 12.95 %   |
|                              | $\bar{X}$                                                | 0.00 %               | 2.30 % | 0.94 % | 0.00 % | 16.67 % | 7.78 %  | 6.67 %  | -         | 4.39 %             | 8.62 %  | 8.18 % | 13.54 % | 15.28 % | 7.78 %  | 15.00 % | -         |
| PID_7                        | Average time of appointment                              | 0.00 %               | 3.45 % | 0.00 % | 9.38 % | 8.33 %  | 6.67 %  | 0.00 %  | 3.97 %    | 10.53 %            | 5.17 %  | 4.72 % | 9.38 %  | 0.00 %  | 6.67 %  | 10.00 % | 6.64 %    |
|                              | Average time of treatment                                | 0.00 %               | 3.45 % | 0.00 % | 6.25 % | 8.33 %  | 6.67 %  | 0.00 %  | 3.53 %    | 7.89 %             | 3.45 %  | 4.72 % | 9.38 %  | 0.00 %  | 13.33 % | 20.00 % | 8.40 %    |
|                              | Average time of waiting                                  | 0.00 %               | 3.45 % | 0.00 % | 3.13 % | 8.33 %  | 6.67 %  | 0.00 %  | 3.08 %    | 10.53 %            | 5.17 %  | 3.77 % | 9.38 %  | 0.00 %  | 6.67 %  | 10.00 % | 6.50 %    |
|                              | Average time of management and administration            | 0.00 %               | 3.45 % | 0.00 % | 3.13 % | 8.33 %  | 6.67 %  | 0.00 %  | 3.08 %    | 10.53 %            | 5.17 %  | 4.72 % | 12.50 % | 0.00 %  | 6.67 %  | 30.00 % | 9.94 %    |
|                              | $\bar{X}$                                                | 0.00 %               | 3.45 % | 0.00 % | 5.47 % | 8.33 %  | 6.67 %  | 0.00 %  | -         | 9.87 %             | 4.74 %  | 4.48 % | 10.16 % | 0.00 %  | 8.33 %  | 17.50 % | -         |

Table 56. (continued)

| Primary information category | Secondary information category | Moderately important |        |        |        |        |        |        |           |
|------------------------------|--------------------------------|----------------------|--------|--------|--------|--------|--------|--------|-----------|
|                              |                                | Phar                 | Phys   | Nurs   | Sdtt   | Psyc   | Sht    | Nutr   | $\bar{X}$ |
| PID_1                        | Allergies and intolerances     | 0.00%                | 1.72%  | 1.89%  | 3.13%  | 0.00%  | 20.00% | 0.00%  | 3.82%     |
|                              | Demography                     | 15.79%               | 22.41% | 19.81% | 15.63% | 33.33% | 20.00% | 20.00% | 21.00%    |
|                              | Pregnancy                      | 5.26%                | 3.45%  | 5.66%  | 9.38%  | 25.00% | 13.33% | 10.00% | 10.30%    |
|                              | Habits                         | 18.42%               | 6.90%  | 8.49%  | 0.00%  | 16.67% | 13.33% | 0.00%  | 9.12%     |
|                              | Clinical and family history    | 2.63%                | 6.90%  | 5.66%  | 9.38%  | 0.00%  | 6.67%  | 0.00%  | 4.46%     |
|                              | Identification                 | 10.53%               | 3.45%  | 3.77%  | 3.13%  | 0.00%  | 20.00% | 0.00%  | 5.84%     |
|                              | Death                          | 15.79%               | 5.17%  | 8.49%  | 9.38%  | 16.67% | 33.33% | 20.00% | 15.55%    |
|                              | Pathologies                    | 2.63%                | 3.45%  | 2.83%  | 0.00%  | 8.33%  | 13.33% | 0.00%  | 4.37%     |
|                              | $\bar{X}$                      | 8.88%                | 6.68%  | 7.08%  | 6.25%  | 12.50% | 17.50% | 6.25%  | -         |
| PID_2                        | Anthropometric evaluation      | 10.53%               | 10.34% | 7.55%  | 9.38%  | 25.00% | 33.33% | 0.00%  | 13.73%    |
|                              | Laboratory tests               | 13.16%               | 3.45%  | 3.77%  | 6.25%  | 16.67% | 20.00% | 0.00%  | 9.04%     |
|                              | Imaging exams                  | 10.53%               | 3.45%  | 3.77%  | 0.00%  | 8.33%  | 20.00% | 30.00% | 10.87%    |

| Primary information category | Secondary information category                           | Moderately important |        |        |        |        |        |        |        |
|------------------------------|----------------------------------------------------------|----------------------|--------|--------|--------|--------|--------|--------|--------|
|                              |                                                          | Phar                 | Phys   | Nurs   | Sdtt   | Psyc   | Sht    | Nutr   | X̄     |
| PID_1                        | Rapid tests                                              | 18.42%               | 8.62%  | 9.43%  | 6.25%  | 16.67% | 26.67% | 40.00% | 18.01% |
|                              | Physical exams                                           | 13.16%               | 8.62%  | 5.66%  | 9.38%  | 8.33%  | 26.67% | 10.00% | 11.69% |
|                              | Electrocardiogram                                        | 7.89%                | 6.90%  | 4.72%  | 0.00%  | 0.00%  | 20.00% | 40.00% | 11.36% |
|                              | Vital parameters                                         | 13.16%               | 3.45%  | 5.66%  | 3.13%  | 0.00%  | 26.67% | 0.00%  | 7.44%  |
|                              | X̄                                                       | 12.41%               | 6.40%  | 5.80%  | 4.91%  | 10.71% | 24.76% | 17.14% | -      |
| PID_3                        | Vaccination and immunization                             | 2.63%                | 3.45%  | 4.72%  | 6.25%  | 0.00%  | 13.33% | 40.00% | 10.05% |
|                              | Screenings                                               | 2.63%                | 3.45%  | 4.72%  | 6.25%  | 0.00%  | 13.33% | 40.00% | 10.05% |
|                              | Diet                                                     | 18.42%               | 8.62%  | 8.49%  | 18.75% | 16.67% | 13.33% | 0.00%  | 12.04% |
|                              | Physical activity                                        | 15.79%               | 8.62%  | 10.38% | 12.50% | 16.67% | 13.33% | 0.00%  | 11.04% |
|                              | Antimicrobial resistance                                 | 2.63%                | 8.62%  | 4.72%  | 18.75% | 8.33%  | 20.00% | 20.00% | 11.86% |
|                              | Smoking                                                  | 7.89%                | 8.62%  | 8.49%  | 15.63% | 33.33% | 20.00% | 10.00% | 14.85% |
|                              | Epidemiology                                             | 10.53%               | 15.52% | 7.55%  | 15.63% | 0.00%  | 20.00% | 20.00% | 12.75% |
|                              | X̄                                                       | 8.65%                | 8.13%  | 7.01%  | 13.39% | 10.71% | 16.19% | 18.57% | -      |
| PID_4                        | Medicines                                                | 2.63%                | 1.72%  | 5.66%  | 9.38%  | 16.67% | 13.33% | 0.00%  | 7.06%  |
|                              | Pharmaceutical products                                  | 7.89%                | 10.34% | 14.15% | 9.38%  | 8.33%  | 20.00% | 10.00% | 11.44% |
|                              | Medical consumables                                      | 13.16%               | 15.52% | 17.92% | 18.75% | 16.67% | 26.67% | 20.00% | 18.38% |
|                              | Laboratory consumables                                   | 15.79%               | 20.69% | 16.04% | 12.50% | 25.00% | 26.67% | 20.00% | 19.53% |
|                              | Drug interactions                                        | 0.00%                | 5.17%  | 8.49%  | 6.25%  | 0.00%  | 20.00% | 10.00% | 7.13%  |
|                              | Dosage                                                   | 2.63%                | 3.45%  | 7.55%  | 3.13%  | 8.33%  | 20.00% | 20.00% | 9.30%  |
|                              | Technical information about healthcare technologies      | 7.89%                | 18.97% | 13.21% | 6.25%  | 25.00% | 26.67% | 20.00% | 16.85% |
|                              | X̄                                                       | 7.14%                | 10.84% | 11.86% | 9.38%  | 14.29% | 21.90% | 14.29% | -      |
| PID_5                        | Access to emergency services                             | 10.53%               | 8.62%  | 3.77%  | 9.38%  | 8.33%  | 13.33% | 10.00% | 9.14%  |
|                              | Access to appointments                                   | 10.53%               | 8.62%  | 5.66%  | 15.63% | 0.00%  | 13.33% | 10.00% | 9.11%  |
|                              | Access to treatments                                     | 10.53%               | 8.62%  | 6.60%  | 12.50% | 8.33%  | 20.00% | 20.00% | 12.37% |
|                              | Access to surgeries                                      | 13.16%               | 12.07% | 5.66%  | 12.50% | 16.67% | 6.67%  | 20.00% | 12.39% |
|                              | X̄                                                       | 11.18%               | 9.48%  | 5.42%  | 12.50% | 8.33%  | 13.33% | 15.00% | -      |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 21.05%               | 24.14% | 20.75% | 18.75% | 16.67% | 26.67% | 40.00% | 24.00% |
|                              | Cost with medicines                                      | 18.42%               | 18.97% | 18.87% | 18.75% | 25.00% | 26.67% | 40.00% | 23.81% |
|                              | Cost with pharmaceutical products                        | 23.68%               | 27.59% | 21.70% | 15.63% | 16.67% | 20.00% | 40.00% | 23.61% |
|                              | Cost with medical consumables                            | 28.95%               | 32.76% | 20.75% | 15.63% | 16.67% | 26.67% | 40.00% | 25.92% |
|                              | Cost with laboratory consumables                         | 28.95%               | 31.03% | 20.75% | 15.63% | 16.67% | 26.67% | 40.00% | 25.67% |
|                              | Cost with human resources                                | 21.05%               | 27.59% | 20.75% | 15.63% | 16.67% | 20.00% | 30.00% | 21.67% |
|                              | X̄                                                       | 23.68%               | 27.01% | 20.60% | 16.67% | 18.06% | 24.44% | 38.33% | -      |
| PID_7                        | Average time of appointment                              | 23.68%               | 20.69% | 16.98% | 21.88% | 25.00% | 26.67% | 20.00% | 22.13% |
|                              | Average time of treatment                                | 18.42%               | 17.24% | 16.98% | 25.00% | 25.00% | 26.67% | 10.00% | 19.90% |
|                              | Average time of waiting                                  | 18.42%               | 13.79% | 16.98% | 28.13% | 16.67% | 26.67% | 20.00% | 20.09% |
|                              | Average time of management and administration            | 23.68%               | 20.69% | 18.87% | 25.00% | 16.67% | 26.67% | 20.00% | 21.65% |
|                              | X̄                                                       | 21.05%               | 18.10% | 17.45% | 25.00% | 20.83% | 26.67% | 17.50% | -      |

Table 56. (continued)

| Primary information category | Secondary information category                      | Important |         |         |         |         |         |         |         | Very important |         |         |         |         |         |         |         |
|------------------------------|-----------------------------------------------------|-----------|---------|---------|---------|---------|---------|---------|---------|----------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                     | Phar      | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | X       | Phar           | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | X       |
| PID_1                        | Allergies and intolerances                          | 34.21 %   | 17.24 % | 15.09 % | 25.00 % | 41.67 % | 20.00 % | 30.00 % | 26.17 % | 65.79 %        | 79.31 % | 82.08 % | 68.75 % | 41.67 % | 60.00 % | 70.00 % | 66.80 % |
|                              | Demography                                          | 47.37 %   | 41.38 % | 44.34 % | 50.00 % | 33.33 % | 53.33 % | 50.00 % | 45.68 % | 26.32 %        | 31.03 % | 28.30 % | 21.88 % | 25.00 % | 6.67 %  | 30.00 % | 24.17 % |
|                              | Pregnancy                                           | 31.58 %   | 24.14 % | 33.96 % | 31.25 % | 41.67 % | 20.00 % | 30.00 % | 30.37 % | 63.16 %        | 70.69 % | 59.43 % | 59.38 % | 33.33 % | 53.33 % | 60.00 % | 57.05 % |
|                              | Habits                                              | 39.47 %   | 39.66 % | 30.19 % | 53.13 % | 41.67 % | 33.33 % | 30.00 % | 38.21 % | 42.11 %        | 51.72 % | 59.43 % | 46.88 % | 41.67 % | 46.67 % | 70.00 % | 51.21 % |
|                              | Clinical and family history                         | 42.11 %   | 36.21 % | 26.42 % | 21.88 % | 50.00 % | 26.67 % | 40.00 % | 34.75 % | 55.26 %        | 55.17 % | 66.98 % | 68.75 % | 50.00 % | 66.67 % | 60.00 % | 60.40 % |
|                              | Identification                                      | 42.11 %   | 27.59 % | 22.64 % | 37.50 % | 50.00 % | 33.33 % | 30.00 % | 34.74 % | 44.74 %        | 68.97 % | 72.64 % | 56.25 % | 50.00 % | 46.67 % | 70.00 % | 58.47 % |
|                              | Death                                               | 39.47 %   | 34.48 % | 30.19 % | 46.88 % | 50.00 % | 26.67 % | 40.00 % | 38.24 % | 39.47 %        | 56.90 % | 54.72 % | 34.38 % | 25.00 % | 33.33 % | 40.00 % | 40.54 % |
|                              | Pathologies                                         | 28.95 %   | 20.69 % | 16.98 % | 25.00 % | 33.33 % | 26.67 % | 30.00 % | 25.95 % | 68.42 %        | 75.86 % | 79.25 % | 75.00 % | 50.00 % | 60.00 % | 70.00 % | 68.36 % |
|                              | X                                                   | 38.16 %   | 30.17 % | 27.48 % | 36.33 % | 42.71 % | 30.00 % | 35.00 % | -       | 50.66 %        | 61.21 % | 62.85 % | 53.91 % | 39.58 % | 46.67 % | 58.75 % | -       |
| PID_2                        | Anthropometric evaluation                           | 44.74 %   | 44.83 % | 40.57 % | 40.63 % | 33.33 % | 40.00 % | 30.00 % | 39.16 % | 36.84 %        | 41.38 % | 48.11 % | 37.50 % | 25.00 % | 20.00 % | 70.00 % | 39.83 % |
|                              | Laboratory tests                                    | 31.58 %   | 25.86 % | 34.91 % | 37.50 % | 33.33 % | 26.67 % | 30.00 % | 31.41 % | 52.63 %        | 68.97 % | 60.38 % | 50.00 % | 25.00 % | 53.33 % | 70.00 % | 54.33 % |
|                              | Imaging exams                                       | 31.58 %   | 24.14 % | 34.91 % | 34.38 % | 41.67 % | 26.67 % | 30.00 % | 31.90 % | 50.00 %        | 72.41 % | 59.43 % | 62.50 % | 25.00 % | 53.33 % | 40.00 % | 51.81 % |
|                              | Rapid tests                                         | 42.11 %   | 46.55 % | 38.68 % | 46.88 % | 41.67 % | 40.00 % | 30.00 % | 40.84 % | 34.21 %        | 43.10 % | 50.00 % | 37.50 % | 25.00 % | 26.67 % | 30.00 % | 35.21 % |
|                              | Physical exams                                      | 42.11 %   | 37.93 % | 33.96 % | 43.75 % | 50.00 % | 40.00 % | 50.00 % | 42.54 % | 36.84 %        | 51.72 % | 57.55 % | 40.63 % | 25.00 % | 26.67 % | 40.00 % | 39.77 % |
|                              | Electrocardiogram                                   | 42.11 %   | 31.03 % | 41.51 % | 40.63 % | 50.00 % | 33.33 % | 20.00 % | 36.94 % | 39.47 %        | 60.34 % | 51.89 % | 43.75 % | 25.00 % | 40.00 % | 30.00 % | 41.49 % |
|                              | Vital parameters                                    | 34.21 %   | 34.48 % | 24.53 % | 46.88 % | 50.00 % | 33.33 % | 50.00 % | 39.06 % | 47.37 %        | 60.34 % | 68.87 % | 43.75 % | 25.00 % | 40.00 % | 40.00 % | 46.48 % |
|                              | X                                                   | 38.35 %   | 34.98 % | 35.58 % | 41.52 % | 42.86 % | 34.29 % | 34.29 % | -       | 42.48 %        | 56.90 % | 56.60 % | 45.09 % | 25.00 % | 37.14 % | 45.71 % | -       |
| PID_3                        | Vaccination and immunization                        | 36.84 %   | 36.21 % | 18.87 % | 46.88 % | 58.33 % | 33.33 % | 30.00 % | 37.21 % | 60.53 %        | 60.34 % | 75.47 % | 40.63 % | 33.33 % | 40.00 % | 30.00 % | 48.61 % |
|                              | Screenings                                          | 36.84 %   | 36.21 % | 18.87 % | 46.88 % | 58.33 % | 33.33 % | 30.00 % | 37.21 % | 60.53 %        | 60.34 % | 75.47 % | 40.63 % | 33.33 % | 40.00 % | 30.00 % | 48.61 % |
|                              | Diet                                                | 39.47 %   | 37.93 % | 33.02 % | 46.88 % | 50.00 % | 26.67 % | 30.00 % | 37.71 % | 42.11 %        | 46.55 % | 55.66 % | 31.25 % | 25.00 % | 46.67 % | 70.00 % | 45.32 % |
|                              | Physical activity                                   | 44.74 %   | 37.93 % | 38.68 % | 50.00 % | 50.00 % | 26.67 % | 50.00 % | 42.57 % | 39.47 %        | 46.55 % | 47.17 % | 34.38 % | 25.00 % | 40.00 % | 50.00 % | 40.37 % |
|                              | Antimicrobial resistance                            | 34.21 %   | 31.03 % | 30.19 % | 37.50 % | 41.67 % | 20.00 % | 40.00 % | 33.51 % | 63.16 %        | 58.62 % | 65.09 % | 40.63 % | 33.33 % | 53.33 % | 30.00 % | 49.17 % |
|                              | Smoking                                             | 39.47 %   | 34.48 % | 35.85 % | 40.63 % | 33.33 % | 26.67 % | 30.00 % | 34.35 % | 52.63 %        | 55.17 % | 53.77 % | 40.63 % | 25.00 % | 40.00 % | 60.00 % | 46.74 % |
|                              | Epidemiology                                        | 50.00 %   | 32.76 % | 33.02 % | 46.88 % | 58.33 % | 13.33 % | 60.00 % | 42.05 % | 39.47 %        | 46.55 % | 53.77 % | 34.38 % | 25.00 % | 46.67 % | 20.00 % | 37.98 % |
|                              | X                                                   | 40.23 %   | 35.22 % | 29.78 % | 45.09 % | 50.00 % | 25.71 % | 38.57 % | -       | 51.13 %        | 53.45 % | 60.92 % | 37.50 % | 28.57 % | 43.81 % | 41.43 % | -       |
| PID_4                        | Medicines                                           | 28.95 %   | 24.14 % | 20.75 % | 31.25 % | 41.67 % | 33.33 % | 60.00 % | 34.30 % | 65.79 %        | 74.14 % | 73.58 % | 56.25 % | 41.67 % | 46.67 % | 40.00 % | 56.87 % |
|                              | Pharmaceutical products                             | 34.21 %   | 39.66 % | 31.13 % | 43.75 % | 41.67 % | 20.00 % | 50.00 % | 37.20 % | 55.26 %        | 50.00 % | 53.77 % | 43.75 % | 41.67 % | 46.67 % | 30.00 % | 45.87 % |
|                              | Medical consumables                                 | 42.11 %   | 43.10 % | 33.96 % | 50.00 % | 41.67 % | 6.67 %  | 60.00 % | 39.64 % | 36.84 %        | 37.93 % | 46.23 % | 21.88 % | 16.67 % | 40.00 % | 10.00 % | 29.93 % |
|                              | Laboratory consumables                              | 42.11 %   | 36.21 % | 35.85 % | 56.25 % | 33.33 % | 13.33 % | 50.00 % | 38.15 % | 34.21 %        | 37.93 % | 44.34 % | 21.88 % | 16.67 % | 33.33 % | 10.00 % | 28.34 % |
|                              | Drug interactions                                   | 31.58 %   | 31.03 % | 23.58 % | 40.63 % | 41.67 % | 20.00 % | 50.00 % | 34.07 % | 65.79 %        | 63.79 % | 66.98 % | 46.88 % | 41.67 % | 53.33 % | 30.00 % | 52.63 % |
|                              | Dosage                                              | 28.95 %   | 32.76 % | 23.58 % | 37.50 % | 41.67 % | 20.00 % | 40.00 % | 32.07 % | 65.79 %        | 63.79 % | 68.87 % | 53.13 % | 33.33 % | 33.33 % | 40.00 % | 51.18 % |
|                              | Technical information about healthcare technologies | 44.74 %   | 44.83 % | 32.08 % | 46.88 % | 41.67 % | 13.33 % | 50.00 % | 39.07 % | 44.74 %        | 31.03 % | 52.83 % | 46.88 % | 16.67 % | 33.33 % | 20.00 % | 35.07 % |
|                              | X                                                   | 36.09 %   | 35.96 % | 28.71 % | 43.75 % | 40.48 % | 18.10 % | 51.43 % | -       | 52.63 %        | 51.23 % | 58.09 % | 41.52 % | 29.76 % | 40.95 % | 25.71 % | -       |
| PID_5                        | Access to emergency services                        | 39.47 %   | 32.76 % | 36.79 % | 56.25 % | 58.33 % | 33.33 % | 60.00 % | 45.28 % | 44.74 %        | 55.17 % | 57.55 % | 25.00 % | 25.00 % | 53.33 % | 20.00 % | 40.11 % |
|                              | Access to appointments                              | 34.21 %   | 31.03 % | 35.85 % | 50.00 % | 75.00 % | 53.33 % | 50.00 % | 47.06 % | 50.00 %        | 56.90 % | 58.49 % | 28.13 % | 25.00 % | 33.33 % | 30.00 % | 40.26 % |
|                              | Access to treatments                                | 34.21 %   | 32.76 % | 38.68 % | 56.25 % | 50.00 % | 40.00 % | 50.00 % | 43.13 % | 52.63 %        | 55.17 % | 54.72 % | 25.00 % | 33.33 % | 33.33 % | 20.00 % | 39.17 % |
|                              | Access to surgeries                                 | 36.84 %   | 31.03 % | 36.79 % | 50.00 % | 50.00 % | 40.00 % | 50.00 % | 42.10 % | 47.37 %        | 53.45 % | 54.72 % | 28.13 % | 25.00 % | 46.67 % | 20.00 % | 39.33 % |
|                              | X                                                   | 36.09 %   | 35.96 % | 28.71 % | 43.75 % | 40.48 % | 18.10 % | 51.43 % | -       | 52.63 %        | 51.23 % | 58.09 % | 41.52 % | 29.76 % | 40.95 % | 25.71 % | -       |

| Primary information category | Secondary information category                           | Important |         |         |         |         |         |         |         | Very important |         |         |         |         |         |         |         |
|------------------------------|----------------------------------------------------------|-----------|---------|---------|---------|---------|---------|---------|---------|----------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                          | Phar      | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | X       | Phar           | Phys    | Nurs    | Sdtt    | Psyc    | Sht     | Nutr    | X       |
|                              | $\bar{X}$                                                | 36.18 %   | 31.90 % | 37.03 % | 53.13 % | 58.33 % | 41.67 % | 52.50 % | -       | 48.68 %        | 55.17 % | 56.37 % | 26.56 % | 27.08 % | 41.67 % | 22.50 % | -       |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 50.00 %   | 22.41 % | 33.02 % | 40.63 % | 33.33 % | 33.33 % | 20.00 % | 33.25 % | 26.32 %        | 41.38 % | 36.79 % | 31.25 % | 16.67 % | 26.67 % | 20.00 % | 28.44 % |
|                              | Cost with medicines                                      | 47.37 %   | 29.31 % | 37.74 % | 40.63 % | 33.33 % | 40.00 % | 20.00 % | 35.48 % | 31.58 %        | 43.10 % | 34.91 % | 31.25 % | 16.67 % | 20.00 % | 20.00 % | 28.21 % |
|                              | Cost with pharmaceutical products                        | 47.37 %   | 24.14 % | 34.91 % | 43.75 % | 33.33 % | 40.00 % | 20.00 % | 34.79 % | 26.32 %        | 37.93 % | 34.91 % | 28.13 % | 16.67 % | 20.00 % | 20.00 % | 26.28 % |
|                              | Cost with medical consumables                            | 47.37 %   | 20.69 % | 35.85 % | 43.75 % | 33.33 % | 40.00 % | 20.00 % | 34.43 % | 18.42 %        | 36.21 % | 33.96 % | 25.00 % | 16.67 % | 20.00 % | 20.00 % | 24.32 % |
|                              | Cost with laboratory consumables                         | 44.74 %   | 24.14 % | 36.79 % | 40.63 % | 33.33 % | 40.00 % | 20.00 % | 34.23 % | 21.05 %        | 32.76 % | 33.02 % | 25.00 % | 16.67 % | 20.00 % | 20.00 % | 24.07 % |
|                              | Cost with human resources                                | 52.63 %   | 25.86 % | 33.02 % | 43.75 % | 33.33 % | 40.00 % | 20.00 % | 35.51 % | 18.42 %        | 34.48 % | 36.79 % | 25.00 % | 16.67 % | 20.00 % | 20.00 % | 24.48 % |
|                              | $\bar{X}$                                                | 48.25 %   | 24.43 % | 35.22 % | 42.19 % | 33.33 % | 38.89 % | 20.00 % | -       | 23.68 %        | 37.64 % | 35.06 % | 27.60 % | 16.67 % | 21.11 % | 20.00 % | -       |
| PID_7                        | Average time of appointment                              | 42.11 %   | 36.21 % | 44.34 % | 37.50 % | 58.33 % | 40.00 % | 40.00 % | 42.64 % | 23.68 %        | 34.48 % | 33.96 % | 21.88 % | 8.33 %  | 20.00 % | 30.00 % | 24.62 % |
|                              | Average time of treatment                                | 47.37 %   | 44.83 % | 44.34 % | 40.63 % | 50.00 % | 33.33 % | 40.00 % | 42.93 % | 26.32 %        | 31.03 % | 33.96 % | 18.75 % | 16.67 % | 20.00 % | 30.00 % | 25.25 % |
|                              | Average time of waiting                                  | 44.74 %   | 41.38 % | 40.57 % | 40.63 % | 58.33 % | 46.67 % | 30.00 % | 43.19 % | 26.32 %        | 36.21 % | 38.68 % | 18.75 % | 16.67 % | 13.33 % | 40.00 % | 27.14 % |
|                              | Average time of management and administration            | 44.74 %   | 37.93 % | 43.40 % | 43.75 % | 58.33 % | 40.00 % | 30.00 % | 42.59 % | 21.05 %        | 32.76 % | 33.02 % | 15.63 % | 16.67 % | 20.00 % | 20.00 % | 22.73 % |
|                              | $\bar{X}$                                                | 44.74 %   | 40.09 % | 43.16 % | 40.63 % | 56.25 % | 40.00 % | 35.00 % | -       | 24.34 %        | 33.62 % | 34.91 % | 18.75 % | 14.58 % | 18.33 % | 30.00 % | -       |

## Annex XXV – Patients' perspectives by age group about healthcare data importance: standard deviation

Table 57. Patients' perspectives by age group about healthcare data importance: standard deviation

| Primary information category | Secondary information category | Standard deviation |         |         |         |         |         |           | $\bar{X}$ |
|------------------------------|--------------------------------|--------------------|---------|---------|---------|---------|---------|-----------|-----------|
|                              |                                | $\leq 18$          | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | $\geq 65$ |           |
| PID_1 <sup>a)</sup>          | Allergies and intolerances     | 0.58               | 0.77    | 0.75    | 1.04    | 1.06    | 1.27    | 1.21      | 0.95      |
|                              | Demography                     | 0.58               | 1.13    | 0.94    | 1.09    | 1.10    | 1.25    | 1.28      | 1.05      |
|                              | Pregnancy                      | 0.58               | 0.96    | 0.73    | 1.05    | 1.10    | 1.32    | 1.43      | 1.02      |
|                              | Habits                         | 0.58               | 0.85    | 0.87    | 1.02    | 1.05    | 1.26    | 1.34      | 1.00      |
|                              | Clinical and family history    | 0.58               | 0.81    | 0.73    | 1.03    | 1.06    | 1.24    | 1.32      | 0.97      |
|                              | Identification                 | 0.58               | 1.15    | 0.85    | 1.08    | 1.04    | 1.32    | 1.27      | 1.04      |
|                              | Death                          | 0.58               | 0.91    | 0.79    | 1.09    | 1.21    | 1.30    | 1.41      | 1.04      |
|                              | Pathologies                    | 0.58               | 0.69    | 0.73    | 1.02    | 1.06    | 1.31    | 1.26      | 0.95      |
|                              | $\bar{X}$                      | 0.58               | 0.91    | 0.80    | 1.05    | 1.09    | 1.28    | 1.32      | -         |
| PID_2 <sup>a)</sup>          | Anthropometric evaluation      | 0.58               | 1.00    | 0.96    | 1.09    | 1.06    | 1.19    | 1.23      | 1.02      |
|                              | Laboratory tests               | 0.58               | 0.76    | 0.70    | 1.01    | 1.04    | 1.21    | 1.20      | 0.93      |
|                              | Imaging exams                  | 0.58               | 0.81    | 0.73    | 1.02    | 1.02    | 1.24    | 1.15      | 0.93      |
|                              | Rapid tests                    | 0.58               | 0.85    | 0.79    | 1.03    | 1.04    | 1.21    | 1.26      | 0.96      |
|                              | Physical exams                 | 0.58               | 0.75    | 0.79    | 1.03    | 1.01    | 1.16    | 1.23      | 0.93      |
|                              | Electrocardiogram              | 0.58               | 0.79    | 0.64    | 1.01    | 1.00    | 1.19    | 1.26      | 0.92      |
|                              | Vital parameters               | 0.58               | 0.68    | 0.89    | 1.01    | 1.00    | 1.18    | 1.26      | 0.94      |
|                              | $\bar{X}$                      | 0.58               | 0.81    | 0.78    | 1.03    | 1.02    | 1.20    | 1.23      | -         |
| PID_3 <sup>a)</sup>          | Vaccination and immunization   | 0.58               | 0.89    | 0.73    | 1.10    | 1.04    | 1.26    | 1.12      | 0.96      |
|                              | Screenings                     | 0.58               | 0.84    | 0.79    | 1.10    | 1.08    | 1.23    | 1.09      | 0.96      |
|                              | Diet                           | 0.58               | 0.85    | 0.88    | 1.09    | 1.10    | 1.26    | 0.99      | 0.96      |
|                              | Physical activity              | 0.58               | 0.98    | 0.91    | 1.10    | 1.13    | 1.20    | 1.07      | 0.99      |
|                              | Antimicrobial resistance       | 0.58               | 0.96    | 0.76    | 1.09    | 1.14    | 1.30    | 1.13      | 1.00      |
|                              | Smoking                        | 0.58               | 1.11    | 0.86    | 1.06    | 1.14    | 1.28    | 1.03      | 1.01      |
|                              | Epidemiology                   | 0.58               | 0.82    | 0.75    | 1.07    | 1.09    | 1.26    | 1.06      | 0.95      |
|                              | $\bar{X}$                      | 0.58               | 0.92    | 0.81    | 1.09    | 1.10    | 1.26    | 1.07      | -         |
| PID_4 <sup>a)</sup>          | Medicines                      | 0.58               | 0.70    | 0.73    | 0.96    | 1.05    | 1.37    | 1.21      | 0.94      |
|                              | Pharmaceutical products        | 0.58               | 0.89    | 0.85    | 0.98    | 1.09    | 1.36    | 1.17      | 0.99      |
|                              | Medical consumables            | 0.58               | 0.89    | 0.92    | 1.10    | 1.14    | 1.30    | 1.20      | 1.02      |
|                              | Laboratory consumables         | 0.58               | 0.88    | 0.92    | 1.11    | 1.15    | 1.32    | 1.20      | 1.02      |
|                              | Drug interactions              | 0.58               | 0.76    | 0.91    | 1.05    | 1.10    | 1.29    | 1.27      | 0.99      |
|                              | Dosage                         | 0.58               | 0.76    | 0.75    | 1.04    | 1.09    | 1.31    | 1.25      | 0.97      |

| Primary information category | Secondary information category                           | Standard deviation |         |         |         |         |         |           | $\bar{X}$ |
|------------------------------|----------------------------------------------------------|--------------------|---------|---------|---------|---------|---------|-----------|-----------|
|                              |                                                          | $\leq 18$          | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | $\geq 65$ |           |
|                              | Technical information about healthcare technologies      | 0.58               | 0.92    | 0.90    | 1.08    | 1.08    | 1.32    | 1.41      | 1.04      |
|                              | $\bar{X}$                                                | 0.58               | 0.83    | 0.85    | 1.05    | 1.10    | 1.32    | 1.24      | -         |
| PID_5 <sup>a)</sup>          | Access to emergency services                             | 0.58               | 0.70    | 0.82    | 1.03    | 1.12    | 1.34    | 1.24      | 0.97      |
|                              | Access to appointments                                   | 0.58               | 0.69    | 0.90    | 0.98    | 1.08    | 1.28    | 1.22      | 0.96      |
|                              | Access to treatments                                     | 0.58               | 0.76    | 0.73    | 0.99    | 1.09    | 1.30    | 1.22      | 0.95      |
|                              | Access to surgeries                                      | 0.58               | 0.70    | 0.87    | 1.01    | 1.08    | 1.30    | 1.22      | 0.96      |
|                              | $\bar{X}$                                                | 0.58               | 0.71    | 0.83    | 1.00    | 1.09    | 1.30    | 1.22      | -         |
| PID_6 <sup>a)</sup>          | Cost with complementary diagnostic and therapeutic exams | 0.58               | 1.05    | 0.84    | 1.12    | 1.19    | 1.30    | 1.30      | 1.06      |
|                              | Cost with medicines                                      | 0.58               | 1.05    | 0.74    | 1.10    | 1.14    | 1.31    | 1.33      | 1.03      |
|                              | Cost with pharmaceutical products                        | 0.58               | 1.05    | 0.79    | 1.11    | 1.13    | 1.25    | 1.33      | 1.03      |
|                              | Cost with medical consumables                            | 0.58               | 1.05    | 0.88    | 1.20    | 1.16    | 1.28    | 1.33      | 1.07      |
|                              | Cost with laboratory consumables                         | 0.58               | 1.03    | 0.93    | 1.18    | 1.17    | 1.28    | 1.33      | 1.07      |
|                              | Cost with human resources                                | 0.58               | 1.18    | 0.94    | 1.21    | 1.17    | 1.29    | 1.30      | 1.10      |
|                              | $\bar{X}$                                                | 0.58               | 1.07    | 0.85    | 1.16    | 1.16    | 1.29    | 1.32      | -         |
| PID_7 <sup>a)</sup>          | Average time of appointment                              | 0.58               | 0.85    | 0.89    | 1.18    | 1.16    | 1.28    | 1.29      | 1.03      |
|                              | Average time of treatment                                | 0.58               | 1.03    | 0.84    | 1.13    | 1.16    | 1.28    | 1.18      | 1.03      |
|                              | Average time of waiting                                  | 0.58               | 1.13    | 0.85    | 1.12    | 1.16    | 1.31    | 1.33      | 1.07      |
|                              | Average time of management and administration            | 0.58               | 1.24    | 1.04    | 1.17    | 1.25    | 1.26    | 1.27      | 1.12      |
|                              | $\bar{X}$                                                | 0.58               | 1.06    | 0.90    | 1.15    | 1.18    | 1.28    | 1.27      | -         |

a) 5-Likert importance scale: 1 - Not important at all; 2 - Not very important; 3 - Moderately important; 4 - Important; 5 - Very important

## Annex XXVI – Patients' perspectives by age group about healthcare data: importance analysis (%)

Table 58. Patients' perspectives by age group about healthcare data: importance analysis (%)

| Primary information category | Secondary information category | Not important at all |         |         |         |         |         |         |           | Not very important |         |         |         |         |         |         |           |
|------------------------------|--------------------------------|----------------------|---------|---------|---------|---------|---------|---------|-----------|--------------------|---------|---------|---------|---------|---------|---------|-----------|
|                              |                                | ≤ 18                 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | $\bar{X}$ | ≤ 18               | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | $\bar{X}$ |
| PID_1                        | Allergies and intolerances     | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 3.60 %  | 9.86%   | 6.06%   | 3.47 %    | 0.00 %             | 0.00%   | 3.85 %  | 1.59 %  | 5.41%   | 2.82 %  | 9.09%   | 3.25 %    |
|                              | Demography                     | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 4.50 %  | 11.27 % | 12.12 % | 4.78 %    | 0.00 %             | 15.79 % | 7.69 %  | 3.17 %  | 15.32 % | 9.86 %  | 12.12 % | 9.14 %    |
|                              | Pregnancy                      | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 4.50 %  | 12.68 % | 15.15 % | 5.41 %    | 0.00 %             | 5.26%   | 1.92 %  | 0.79 %  | 7.21%   | 4.23 %  | 3.03%   | 3.21 %    |
|                              | Habits                         | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 3.60 %  | 11.27 % | 15.15 % | 4.97 %    | 0.00 %             | 0.00%   | 3.85 %  | 2.38 %  | 9.01%   | 4.23 %  | 3.03%   | 3.21 %    |
|                              | Clinical and family history    | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 3.60 %  | 9.86%   | 9.09%   | 4.02 %    | 0.00 %             | 0.00%   | 1.92 %  | 0.79 %  | 5.41%   | 1.41 %  | 9.09%   | 2.66 %    |
|                              | Identification                 | 0.00 %               | 5.26%   | 0.00 %  | 5.56 %  | 3.60 %  | 12.68 % | 9.09%   | 5.17 %    | 0.00 %             | 5.26%   | 3.85 %  | 2.38 %  | 7.21%   | 4.23 %  | 9.09%   | 4.57 %    |
|                              | Death                          | 0.00 %               | 0.00%   | 0.00 %  | 6.35 %  | 7.21 %  | 12.68 % | 15.15 % | 5.91 %    | 0.00 %             | 5.26%   | 1.92 %  | 1.59 %  | 10.81 % | 7.04 %  | 6.06%   | 4.67 %    |
|                              | Pathologies                    | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 3.60 %  | 11.27 % | 9.09%   | 4.10 %    | 0.00 %             | 0.00%   | 1.92 %  | 1.59 %  | 6.31%   | 2.82 %  | 6.06%   | 2.67 %    |
|                              | $\bar{X}$                      | 0.00 %               | 0.66%   | 0.00 %  | 5.36 %  | 4.28 %  | 11.44 % | 11.36 % | -         | 0.00 %             | 3.95%   | 3.37 %  | 1.79 %  | 8.33%   | 4.58 %  | 7.20%   | -         |
| PID_2                        | Anthropometric evaluation      | 0.00 %               | 0.00%   | 1.92 %  | 5.56 %  | 3.60 %  | 8.45%   | 9.09%   | 4.09 %    | 0.00 %             | 5.26%   | 3.85 %  | 5.56 %  | 8.11%   | 7.04 %  | 18.18 % | 6.86 %    |
|                              | Laboratory tests               | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 4.50 %  | 8.45%   | 6.06%   | 3.28 %    | 0.00 %             | 0.00%   | 1.92 %  | 3.97 %  | 3.60%   | 4.23 %  | 12.12 % | 3.69 %    |
|                              | Imaging exams                  | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 3.60 %  | 9.86%   | 6.06%   | 3.36 %    | 0.00 %             | 0.00%   | 1.92 %  | 3.97 %  | 4.50%   | 2.82 %  | 9.09%   | 3.19 %    |
|                              | Rapid tests                    | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 3.60 %  | 9.86%   | 9.09%   | 3.79 %    | 0.00 %             | 0.00%   | 3.85 %  | 3.97 %  | 6.31%   | 2.82 %  | 9.09%   | 3.72 %    |
|                              | Physical exams                 | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 3.60 %  | 8.45%   | 9.09%   | 3.59 %    | 0.00 %             | 0.00%   | 3.85 %  | 3.97 %  | 4.50%   | 2.82 %  | 9.09%   | 3.46 %    |
|                              | Electrocardiogram              | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 3.60 %  | 8.45%   | 9.09%   | 3.59 %    | 0.00 %             | 0.00%   | 0.00 %  | 3.97 %  | 3.60%   | 2.82 %  | 9.09%   | 2.78 %    |
|                              | Vital parameters               | 0.00 %               | 0.00%   | 1.92 %  | 3.97 %  | 3.60 %  | 8.45%   | 9.09%   | 3.86 %    | 0.00 %             | 0.00%   | 1.92 %  | 3.17 %  | 3.60%   | 2.82 %  | 9.09%   | 2.94 %    |
|                              | $\bar{X}$                      | 0.00 %               | 0.00%   | 0.55 %  | 4.20 %  | 3.73 %  | 8.85%   | 8.23%   | -         | 0.00 %             | 0.75%   | 2.47 %  | 4.08 %  | 4.89%   | 3.62 %  | 10.82 % | -         |
|                              |                                |                      |         |         |         |         |         |         |           |                    |         |         |         |         |         |         |           |
| PID_3                        | Vaccination and immunization   | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 4.50 %  | 9.86%   | 6.06%   | 3.71 %    | 0.00 %             | 5.26%   | 1.92 %  | 3.97 %  | 3.60%   | 2.82 %  | 3.03%   | 2.94 %    |
|                              | Screenings                     | 0.00 %               | 0.00%   | 1.92 %  | 5.56 %  | 5.41 %  | 8.45%   | 6.06%   | 3.91 %    | 0.00 %             | 0.00%   | 0.00 %  | 3.17 %  | 3.60%   | 4.23 %  | 3.03%   | 2.00 %    |
|                              | Diet                           | 0.00 %               | 0.00%   | 1.92 %  | 5.56 %  | 6.31 %  | 11.27 % | 6.06%   | 4.44 %    | 0.00 %             | 0.00%   | 1.92 %  | 3.97 %  | 5.41%   | 4.23 %  | 3.03%   | 2.65 %    |
|                              | Physical activity              | 0.00 %               | 0.00%   | 1.92 %  | 5.56 %  | 7.21 %  | 8.45%   | 6.06%   | 4.17 %    | 0.00 %             | 5.26%   | 1.92 %  | 4.76 %  | 5.41%   | 5.63 %  | 6.06%   | 4.15 %    |
|                              | Antimicrobial resistance       | 0.00 %               | 0.00%   | 0.00 %  | 6.35 %  | 6.31 %  | 8.45%   | 6.06%   | 3.88 %    | 0.00 %             | 5.26%   | 1.92 %  | 2.38 %  | 5.41%   | 8.45 %  | 6.06%   | 4.21 %    |
|                              | Smoking                        | 0.00 %               | 5.26%   | 1.92 %  | 4.76 %  | 7.21 %  | 12.68 % | 6.06%   | 5.41 %    | 0.00 %             | 0.00%   | 1.92 %  | 3.97 %  | 5.41%   | 4.23 %  | 3.03%   | 2.65 %    |
|                              | Epidemiology                   | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 5.41 %  | 9.86%   | 6.06%   | 3.84 %    | 0.00 %             | 0.00%   | 1.92 %  | 2.38 %  | 3.60%   | 4.23 %  | 3.03%   | 2.17 %    |
|                              | $\bar{X}$                      | 0.00 %               | 0.75%   | 1.10 %  | 5.56 %  | 6.05 %  | 9.86%   | 6.06%   | -         | 0.00 %             | 2.26%   | 1.65 %  | 3.51 %  | 4.63%   | 4.83 %  | 3.90%   | -         |
| PID_4                        | Medicines                      | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 4.50 %  | 12.68 % | 9.09%   | 4.32 %    | 0.00 %             | 0.00%   | 1.92 %  | 1.59 %  | 3.60%   | 4.23 %  | 6.06%   | 2.49 %    |
|                              | Pharmaceutical products        | 0.00 %               | 0.00%   | 0.00 %  | 3.97 %  | 4.50 %  | 14.08 % | 9.09%   | 4.52 %    | 0.00 %             | 0.00%   | 3.85 %  | 1.59 %  | 6.31%   | 4.23 %  | 6.06%   | 3.15 %    |
|                              | Medical consumables            | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 6.31 %  | 11.27 % | 9.09%   | 4.60 %    | 0.00 %             | 0.00%   | 7.69 %  | 5.56 %  | 8.11%   | 9.86 %  | 6.06%   | 5.33 %    |
|                              | Laboratory consumables         | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 6.31 %  | 12.68 % | 9.09%   | 4.80 %    | 0.00 %             | 0.00%   | 7.69 %  | 6.35 %  | 9.01%   | 7.04 %  | 6.06%   | 5.16 %    |
|                              | Drug interactions              | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 5.41 %  | 11.27 % | 9.09%   | 4.47 %    | 0.00 %             | 0.00%   | 7.69 %  | 0.79 %  | 4.50%   | 4.23 %  | 6.06%   | 3.33 %    |
|                              | Dosage                         | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 5.41 %  | 11.27 % | 9.09%   | 4.36 %    | 0.00 %             | 0.00%   | 1.92 %  | 2.38 %  | 3.60%   | 4.23 %  | 6.06%   | 2.60 %    |
|                              | Technical information about    | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 4.50 %  | 11.27 % | 12.12 % | 4.67 %    | 0.00 %             | 0.00%   | 7.69 %  | 5.56 %  | 7.21%   | 7.04 %  | 12.12 % | 5.66 %    |

| Primary information category | Secondary information category                           | Not important at all |         |         |         |         |         |       |           | Not very important |         |         |         |         |         |         |           |
|------------------------------|----------------------------------------------------------|----------------------|---------|---------|---------|---------|---------|-------|-----------|--------------------|---------|---------|---------|---------|---------|---------|-----------|
|                              |                                                          | ≤ 18                 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65  | $\bar{X}$ | ≤ 18               | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | $\bar{X}$ |
|                              | healthcare technologies                                  |                      |         |         |         |         |         |       |           |                    |         |         |         |         |         |         |           |
|                              | $\bar{X}$                                                | 0.00 %               | 0.00%   | 0.00 %  | 4.88 %  | 5.28 %  | 12.07 % | 9.52% | -         | 0.00 %             | 0.00%   | 5.49 %  | 3.40 %  | 6.05%   | 5.84 %  | 6.93%   | -         |
| PID_5                        | Access to emergency services                             | 0.00 %               | 0.00%   | 0.00 %  | 5.56 %  | 6.31 %  | 11.27 % | 9.09% | 4.60 %    | 0.00 %             | 0.00%   | 1.92 %  | 0.00 %  | 2.70%   | 4.23 %  | 3.03%   | 1.70 %    |
|                              | Access to appointments                                   | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 6.31 %  | 9.86%   | 9.09% | 4.29 %    | 0.00 %             | 0.00%   | 5.77 %  | 0.00 %  | 0.90%   | 4.23 %  | 3.03%   | 1.99 %    |
|                              | Access to treatments                                     | 0.00 %               | 0.00%   | 0.00 %  | 4.76 %  | 6.31 %  | 11.27 % | 9.09% | 4.49 %    | 0.00 %             | 0.00%   | 0.00 %  | 0.00 %  | 1.80%   | 2.82 %  | 3.03%   | 1.09 %    |
|                              | Access to surgeries                                      | 0.00 %               | 0.00%   | 1.92 %  | 4.76 %  | 6.31 %  | 11.27 % | 9.09% | 4.76 %    | 0.00 %             | 0.00%   | 0.00 %  | 0.79 %  | 1.80%   | 2.82 %  | 3.03%   | 1.21 %    |
|                              | $\bar{X}$                                                | 0.00 %               | 0.00%   | 0.48 %  | 4.96 %  | 6.31 %  | 10.92 % | 9.09% | -         | 0.00 %             | 0.00%   | 1.92 %  | 0.20 %  | 1.80%   | 3.52 %  | 3.03%   | -         |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 0.00 %               | 5.26%   | 1.92 %  | 5.56 %  | 9.01 %  | 11.27 % | 9.09% | 6.02 %    | 0.00 %             | 0.00%   | 0.00 %  | 6.35 %  | 4.50%   | 8.45 %  | 15.15 % | 4.92 %    |
|                              | Cost with medicines                                      | 0.00 %               | 5.26%   | 0.00 %  | 5.56 %  | 7.21 %  | 11.27 % | 9.09% | 5.48 %    | 0.00 %             | 0.00%   | 1.92 %  | 5.56 %  | 4.50%   | 8.45 %  | 18.18 % | 5.52 %    |
|                              | Cost with pharmaceutical products                        | 0.00 %               | 5.26%   | 0.00 %  | 6.35 %  | 7.21 %  | 11.27 % | 9.09% | 5.60 %    | 0.00 %             | 0.00%   | 1.92 %  | 4.76 %  | 4.50%   | 8.45 %  | 18.18 % | 5.40 %    |
|                              | Cost with medical consumables                            | 0.00 %               | 5.26%   | 1.92 %  | 7.94 %  | 9.01 %  | 11.27 % | 9.09% | 6.36 %    | 0.00 %             | 0.00%   | 0.00 %  | 7.94 %  | 5.41%   | 8.45 %  | 18.18 % | 5.71 %    |
|                              | Cost with laboratory consumables                         | 0.00 %               | 5.26%   | 1.92 %  | 7.14 %  | 9.91 %  | 11.27 % | 9.09% | 6.37 %    | 0.00 %             | 0.00%   | 1.92 %  | 8.73 %  | 4.50%   | 8.45 %  | 18.18 % | 5.97 %    |
|                              | Cost with human resources                                | 0.00 %               | 5.26%   | 1.92 %  | 7.14 %  | 9.01 %  | 11.27 % | 9.09% | 6.24 %    | 0.00 %             | 5.26%   | 1.92 %  | 8.73 %  | 5.41%   | 8.45 %  | 18.18 % | 6.85 %    |
|                              | $\bar{X}$                                                | 0.00 %               | 5.26%   | 1.28 %  | 6.61 %  | 8.56 %  | 11.27 % | 9.09% | -         | 0.00 %             | 0.88%   | 1.28 %  | 7.01 %  | 4.80%   | 8.45 %  | 17.68 % | -         |
| PID_7                        | Average time of appointment                              | 0.00 %               | 0.00%   | 0.00 %  | 8.73 %  | 8.11 %  | 9.86%   | 9.09% | 5.11 %    | 0.00 %             | 5.26%   | 1.92 %  | 1.59 %  | 3.60%   | 8.45 %  | 15.15 % | 5.14 %    |
|                              | Average time of treatment                                | 0.00 %               | 5.26%   | 0.00 %  | 7.14 %  | 8.11 %  | 9.86%   | 6.06% | 5.20 %    | 0.00 %             | 0.00%   | 3.85 %  | 1.59 %  | 3.60%   | 8.45 %  | 12.12 % | 4.23 %    |
|                              | Average time of waiting                                  | 0.00 %               | 5.26%   | 0.00 %  | 7.14 %  | 8.11 %  | 11.27 % | 9.09% | 5.84 %    | 0.00 %             | 5.26%   | 1.92 %  | 0.79 %  | 3.60%   | 8.45 %  | 15.15 % | 5.03 %    |
|                              | Average time of management and administration            | 0.00 %               | 10.53 % | 1.92 %  | 7.94 %  | 9.91 %  | 11.27 % | 9.09% | 7.24 %    | 0.00 %             | 0.00%   | 5.77 %  | 2.38 %  | 7.21%   | 9.86 %  | 15.15 % | 5.77 %    |
|                              | $\bar{X}$                                                | 0.00 %               | 5.26%   | 0.48 %  | 7.74 %  | 8.56 %  | 10.56 % | 8.33% | -         | 0.00 %             | 2.63%   | 3.37 %  | 1.59 %  | 4.50%   | 8.80 %  | 14.39 % | -         |

Table 58. (continued)

| Primary information category | Secondary information category | Moderately important |         |         |         |         |         |        |           |
|------------------------------|--------------------------------|----------------------|---------|---------|---------|---------|---------|--------|-----------|
|                              |                                | ≤ 18                 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65   | $\bar{X}$ |
| PID_1                        | Allergies and intolerances     | 66.67%               | 15.79%  | 3.85%   | 9.52%   | 13.51%  | 7.04%   | 3.03%  | 17.06%    |
|                              | Demography                     | 66.67%               | 26.32%  | 26.92%  | 18.25%  | 20.72%  | 18.31%  | 15.15% | 27.48%    |
|                              | Pregnancy                      | 66.67%               | 21.05%  | 7.69%   | 10.32%  | 16.22%  | 9.86%   | 12.12% | 20.56%    |
|                              | Habits                         | 66.67%               | 31.58%  | 25.00%  | 13.49%  | 20.72%  | 16.90%  | 15.15% | 27.07%    |
|                              | Clinical and family history    | 66.67%               | 21.05%  | 7.69%   | 7.14%   | 16.22%  | 7.04%   | 3.03%  | 18.41%    |
|                              | Identification                 | 66.67%               | 15.79%  | 13.46%  | 10.32%  | 11.71%  | 11.27%  | 3.03%  | 18.89%    |
|                              | Death                          | 66.67%               | 21.05%  | 15.38%  | 13.49%  | 15.32%  | 15.49%  | 3.03%  | 21.49%    |
|                              | Pathologies                    | 66.67%               | 10.53%  | 7.69%   | 7.14%   | 10.81%  | 8.45%   | 3.03%  | 16.33%    |
|                              | $\bar{X}$                      | 66.67%               | 20.39%  | 13.46%  | 11.21%  | 15.65%  | 11.80%  | 7.20%  | -         |
| PID_2                        | Anthropometric evaluation      | 66.67%               | 31.58%  | 17.31%  | 11.90%  | 16.22%  | 15.49%  | 9.09%  | 24.04%    |
|                              | Laboratory tests               | 66.67%               | 15.79%  | 5.77%   | 4.76%   | 10.81%  | 5.63%   | 0.00%  | 15.63%    |
|                              | Imaging exams                  | 66.67%               | 21.05%  | 7.69%   | 6.35%   | 11.71%  | 5.63%   | 0.00%  | 17.02%    |

| Primary information category | Secondary information category                           | Moderately important |         |         |         |         |         |        |           |
|------------------------------|----------------------------------------------------------|----------------------|---------|---------|---------|---------|---------|--------|-----------|
|                              |                                                          | ≤ 18                 | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65   | $\bar{X}$ |
| PID_3                        | Rapid tests                                              | 66.67%               | 31.58%  | 7.69%   | 10.32%  | 11.71%  | 7.04%   | 6.06%  | 20.15%    |
|                              | Physical exams                                           | 66.67%               | 15.79%  | 7.69%   | 9.52%   | 11.71%  | 7.04%   | 6.06%  | 17.78%    |
|                              | Electrocardiogram                                        | 66.67%               | 21.05%  | 7.69%   | 4.76%   | 11.71%  | 7.04%   | 0.00%  | 16.99%    |
|                              | Vital parameters                                         | 66.67%               | 10.53%  | 9.62%   | 7.94%   | 11.71%  | 5.63%   | 6.06%  | 16.88%    |
|                              | $\bar{X}$                                                | 66.67%               | 21.05%  | 9.07%   | 7.94%   | 12.23%  | 7.65%   | 3.90%  | -         |
|                              | Vaccination and immunization                             | 66.67%               | 10.53%  | 7.69%   | 5.56%   | 9.91%   | 7.04%   | 9.09%  | 16.64%    |
|                              | Screenings                                               | 66.67%               | 21.05%  | 7.69%   | 7.94%   | 9.91%   | 7.04%   | 9.09%  | 18.48%    |
|                              | Diet                                                     | 66.67%               | 26.32%  | 15.38%  | 17.46%  | 14.41%  | 8.45%   | 15.15% | 23.41%    |
| PID_4                        | Physical activity                                        | 66.67%               | 21.05%  | 23.08%  | 18.25%  | 13.51%  | 14.08%  | 12.12% | 24.11%    |
|                              | Antimicrobial resistance                                 | 66.67%               | 21.05%  | 11.54%  | 6.35%   | 10.81%  | 8.45%   | 6.06%  | 18.70%    |
|                              | Smoking                                                  | 66.67%               | 15.79%  | 11.54%  | 11.90%  | 16.22%  | 14.08%  | 9.09%  | 20.76%    |
|                              | Epidemiology                                             | 66.67%               | 21.05%  | 9.62%   | 8.73%   | 14.41%  | 11.27%  | 12.12% | 20.55%    |
|                              | $\bar{X}$                                                | 66.67%               | 19.55%  | 12.36%  | 10.88%  | 12.74%  | 10.06%  | 10.39% | -         |
|                              | Medicines                                                | 66.67%               | 10.53%  | 7.69%   | 5.56%   | 10.81%  | 5.63%   | 3.03%  | 15.70%    |
|                              | Pharmaceutical products                                  | 66.67%               | 26.32%  | 15.38%  | 11.11%  | 14.41%  | 8.45%   | 6.06%  | 21.20%    |
|                              | Medical consumables                                      | 66.67%               | 26.32%  | 21.15%  | 11.11%  | 16.22%  | 15.49%  | 12.12% | 24.15%    |
| PID_5                        | Laboratory consumables                                   | 66.67%               | 31.58%  | 21.15%  | 10.32%  | 16.22%  | 16.90%  | 12.12% | 24.99%    |
|                              | Drug interactions                                        | 66.67%               | 15.79%  | 9.62%   | 11.11%  | 12.61%  | 8.45%   | 9.09%  | 19.05%    |
|                              | Dosage                                                   | 66.67%               | 15.79%  | 9.62%   | 8.73%   | 12.61%  | 7.04%   | 6.06%  | 18.07%    |
|                              | Technical information about healthcare technologies      | 66.67%               | 31.58%  | 11.54%  | 10.32%  | 15.32%  | 12.68%  | 9.09%  | 22.45%    |
|                              | $\bar{X}$                                                | 66.67%               | 22.56%  | 13.74%  | 9.75%   | 14.03%  | 10.66%  | 8.23%  | -         |
|                              | Access to emergency services                             | 66.67%               | 10.53%  | 15.38%  | 10.32%  | 9.91%   | 8.45%   | 9.09%  | 18.62%    |
|                              | Access to appointments                                   | 66.67%               | 10.53%  | 11.54%  | 9.52%   | 10.81%  | 7.04%   | 6.06%  | 17.45%    |
|                              | Access to treatments                                     | 66.67%               | 15.79%  | 13.46%  | 10.32%  | 9.91%   | 7.04%   | 3.03%  | 18.03%    |
| PID_6                        | Access to surgeries                                      | 66.67%               | 10.53%  | 13.46%  | 9.52%   | 9.91%   | 7.04%   | 3.03%  | 17.17%    |
|                              | $\bar{X}$                                                | 66.67%               | 11.84%  | 13.46%  | 9.92%   | 10.14%  | 7.39%   | 5.30%  | -         |
|                              | Cost with complementary diagnostic and therapeutic exams | 66.67%               | 26.32%  | 17.31%  | 10.32%  | 25.23%  | 16.90%  | 12.12% | 24.98%    |
|                              | Cost with medicines                                      | 66.67%               | 15.79%  | 9.62%   | 8.73%   | 22.52%  | 19.72%  | 9.09%  | 21.73%    |
|                              | Cost with pharmaceutical products                        | 66.67%               | 26.32%  | 15.38%  | 11.11%  | 23.42%  | 22.54%  | 9.09%  | 24.93%    |
|                              | Cost with medical consumables                            | 66.67%               | 21.05%  | 25.00%  | 14.29%  | 24.32%  | 19.72%  | 12.12% | 26.17%    |
|                              | Cost with laboratory consumables                         | 66.67%               | 21.05%  | 25.00%  | 15.08%  | 23.42%  | 19.72%  | 12.12% | 26.15%    |
|                              | Cost with human resources                                | 66.67%               | 21.05%  | 26.92%  | 15.08%  | 22.52%  | 19.72%  | 9.09%  | 25.86%    |
| PID_7                        | $\bar{X}$                                                | 66.67%               | 21.93%  | 19.87%  | 12.43%  | 23.57%  | 19.72%  | 10.61% | -         |
|                              | Average time of appointment                              | 66.67%               | 10.53%  | 32.69%  | 11.90%  | 18.02%  | 14.08%  | 6.06%  | 22.85%    |
|                              | Average time of treatment                                | 66.67%               | 15.79%  | 17.31%  | 11.90%  | 17.12%  | 12.68%  | 12.12% | 21.94%    |
|                              | Average time of waiting                                  | 66.67%               | 15.79%  | 21.15%  | 11.11%  | 19.82%  | 11.27%  | 3.03%  | 21.26%    |
|                              | Average time of management and administration            | 66.67%               | 15.79%  | 25.00%  | 13.49%  | 18.02%  | 16.90%  | 6.06%  | 23.13%    |
|                              | $\bar{X}$                                                | 66.67%               | 14.47%  | 24.04%  | 12.10%  | 18.24%  | 13.73%  | 6.82%  | -         |

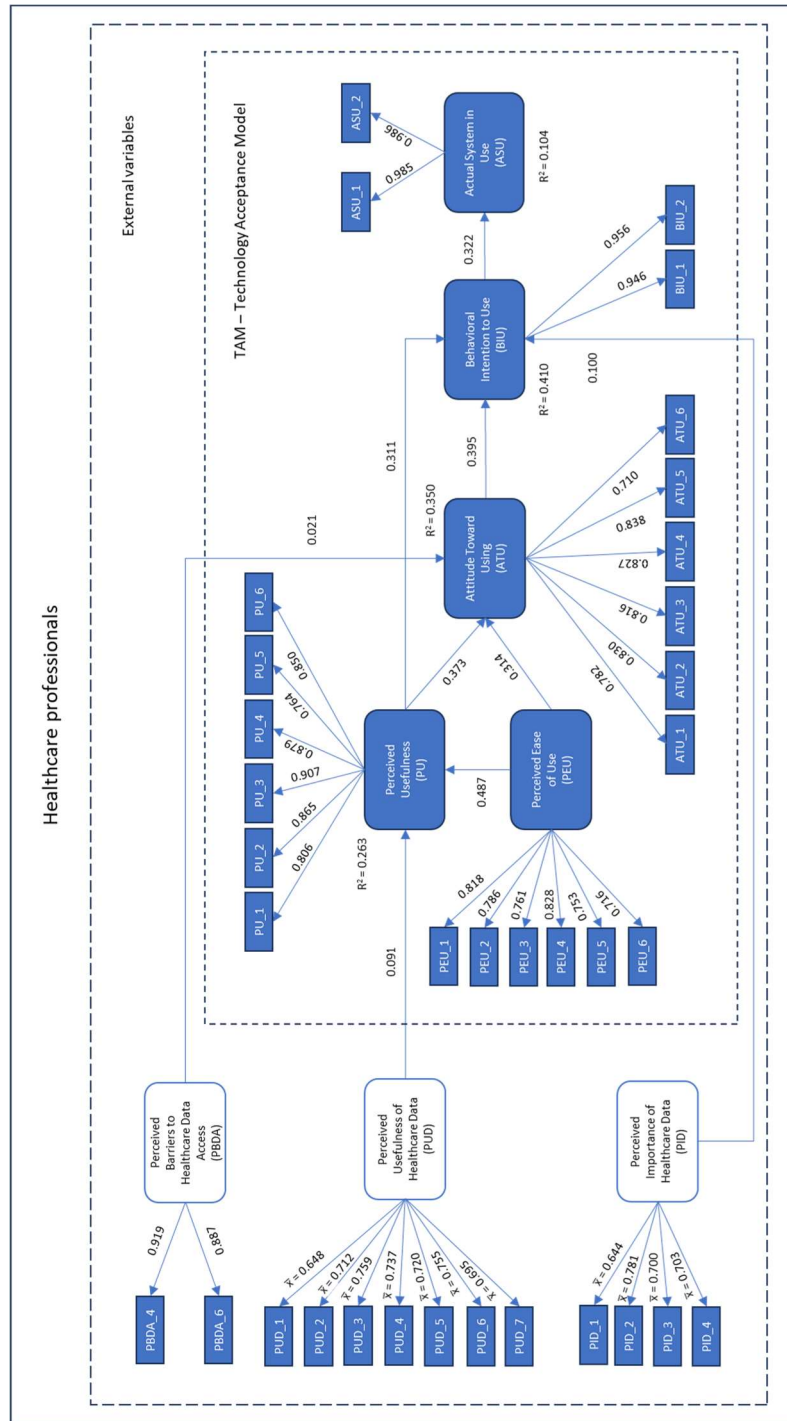
Table 58. (continued)

| Primary information category | Secondary information category                      | Important |         |         |         |         |         |         |         | Very important |         |         |         |         |         |         |         |
|------------------------------|-----------------------------------------------------|-----------|---------|---------|---------|---------|---------|---------|---------|----------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                     | ≤ 18      | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | X       | ≤ 18           | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | X       |
| PID_1                        | Allergies and intolerances                          | 33.33 %   | 26.32 % | 26.92 % | 27.78 % | 31.53 % | 26.76 % | 33.33 % | 29.43 % | 0.00 %         | 57.89 % | 65.38 % | 56.35 % | 45.95 % | 53.52 % | 48.48 % | 46.80 % |
|                              | Demography                                          | 33.33 %   | 21.05 % | 34.62 % | 36.51 % | 40.54 % | 39.44 % | 42.42 % | 35.42 % | 0.00 %         | 36.84 % | 30.77 % | 36.51 % | 18.92 % | 21.13 % | 18.18 % | 23.19 % |
|                              | Pregnancy                                           | 33.33 %   | 26.32 % | 28.85 % | 34.13 % | 36.04 % | 38.03 % | 27.27 % | 31.99 % | 0.00 %         | 47.37 % | 61.54 % | 49.21 % | 36.04 % | 35.21 % | 42.42 % | 38.83 % |
|                              | Habits                                              | 33.33 %   | 31.58 % | 36.54 % | 42.06 % | 41.44 % | 38.03 % | 39.39 % | 37.48 % | 0.00 %         | 36.84 % | 34.62 % | 37.30 % | 25.23 % | 29.58 % | 27.27 % | 27.26 % |
|                              | Clinical and family history                         | 33.33 %   | 31.58 % | 28.85 % | 32.54 % | 34.23 % | 29.58 % | 30.30 % | 31.49 % | 0.00 %         | 47.37 % | 61.54 % | 53.97 % | 40.54 % | 52.11 % | 48.48 % | 43.43 % |
|                              | Identification                                      | 33.33 %   | 31.58 % | 32.69 % | 32.54 % | 44.14 % | 36.62 % | 42.42 % | 36.19 % | 0.00 %         | 42.11 % | 50.00 % | 49.21 % | 33.33 % | 35.21 % | 36.36 % | 35.17 % |
|                              | Death                                               | 33.33 %   | 36.84 % | 38.46 % | 38.10 % | 36.94 % | 38.03 % | 39.39 % | 37.30 % | 0.00 %         | 36.84 % | 44.23 % | 40.48 % | 29.73 % | 26.76 % | 36.36 % | 30.63 % |
|                              | Pathologies                                         | 33.33 %   | 36.84 % | 23.08 % | 26.98 % | 35.14 % | 29.58 % | 36.36 % | 31.62 % | 0.00 %         | 52.63 % | 67.31 % | 59.52 % | 44.14 % | 47.89 % | 45.45 % | 45.28 % |
|                              | X                                                   | 33.33 %   | 30.26 % | 31.25 % | 33.83 % | 37.50 % | 34.51 % | 36.36 % | -       | 0.00 %         | 44.74 % | 51.92 % | 47.82 % | 34.23 % | 37.68 % | 37.88 % | -       |
| PID_2                        | Anthropometric evaluation                           | 33.33 %   | 21.05 % | 36.54 % | 42.06 % | 39.64 % | 40.85 % | 48.48 % | 37.42 % | 0.00 %         | 42.11 % | 40.38 % | 34.92 % | 32.43 % | 28.17 % | 15.15 % | 27.59 % |
|                              | Laboratory tests                                    | 33.33 %   | 31.58 % | 28.85 % | 34.13 % | 39.64 % | 35.21 % | 45.45 % | 35.46 % | 0.00 %         | 52.63 % | 63.46 % | 53.17 % | 41.44 % | 46.48 % | 36.36 % | 41.94 % |
|                              | Imaging exams                                       | 33.33 %   | 31.58 % | 23.08 % | 31.75 % | 37.84 % | 35.21 % | 48.48 % | 34.47 % | 0.00 %         | 47.37 % | 67.31 % | 53.97 % | 42.34 % | 46.48 % | 36.36 % | 41.98 % |
|                              | Rapid tests                                         | 33.33 %   | 31.58 % | 40.38 % | 35.71 % | 39.64 % | 43.66 % | 42.42 % | 38.11 % | 0.00 %         | 36.84 % | 48.08 % | 46.03 % | 38.74 % | 36.62 % | 33.33 % | 34.23 % |
|                              | Physical exams                                      | 33.33 %   | 36.84 % | 36.54 % | 34.13 % | 41.44 % | 43.66 % | 48.48 % | 39.20 % | 0.00 %         | 47.37 % | 51.92 % | 48.41 % | 38.74 % | 38.03 % | 27.27 % | 35.96 % |
|                              | Electrocardiogram                                   | 33.33 %   | 36.84 % | 28.85 % | 35.71 % | 39.64 % | 35.21 % | 45.45 % | 36.43 % | 0.00 %         | 42.11 % | 63.46 % | 51.59 % | 41.44 % | 46.48 % | 36.36 % | 40.21 % |
|                              | Vital parameters                                    | 33.33 %   | 42.11 % | 25.00 % | 33.33 % | 39.64 % | 39.44 % | 42.42 % | 36.47 % | 0.00 %         | 47.37 % | 61.54 % | 51.59 % | 41.44 % | 43.66 % | 33.33 % | 39.85 % |
|                              | X                                                   | 33.33 %   | 33.08 % | 31.32 % | 35.26 % | 39.64 % | 39.03 % | 45.89 % | -       | 0.00 %         | 45.11 % | 56.59 % | 48.53 % | 39.51 % | 40.85 % | 31.17 % | -       |
| PID_3                        | Vaccination and immunization                        | 33.33 %   | 31.58 % | 30.77 % | 30.16 % | 37.84 % | 30.99 % | 33.33 % | 32.57 % | 0.00 %         | 52.63 % | 59.62 % | 54.76 % | 44.14 % | 49.30 % | 48.48 % | 44.13 % |
|                              | Screenings                                          | 33.33 %   | 15.79 % | 40.38 % | 27.78 % | 36.94 % | 29.58 % | 42.42 % | 32.32 % | 0.00 %         | 63.16 % | 50.00 % | 55.56 % | 44.14 % | 50.70 % | 39.39 % | 43.28 % |
|                              | Diet                                                | 33.33 %   | 26.32 % | 44.23 % | 38.10 % | 45.05 % | 42.25 % | 57.58 % | 40.98 % | 0.00 %         | 47.37 % | 36.54 % | 34.92 % | 28.83 % | 33.80 % | 18.18 % | 28.52 % |
|                              | Physical activity                                   | 33.33 %   | 21.05 % | 40.38 % | 38.10 % | 44.14 % | 39.44 % | 51.52 % | 38.28 % | 0.00 %         | 52.63 % | 32.69 % | 33.33 % | 29.73 % | 32.39 % | 24.24 % | 29.29 % |
|                              | Antimicrobial resistance                            | 33.33 %   | 26.32 % | 38.46 % | 36.51 % | 36.94 % | 25.35 % | 42.42 % | 34.19 % | 0.00 %         | 47.37 % | 48.08 % | 48.41 % | 40.54 % | 49.30 % | 39.39 % | 39.01 % |
|                              | Smoking                                             | 33.33 %   | 15.79 % | 46.15 % | 38.89 % | 41.44 % | 42.25 % | 54.55 % | 38.92 % | 0.00 %         | 63.16 % | 38.46 % | 40.48 % | 29.73 % | 26.76 % | 27.27 % | 32.27 % |
|                              | Epidemiology                                        | 33.33 %   | 26.32 % | 36.54 % | 34.13 % | 35.14 % | 33.80 % | 48.48 % | 35.39 % | 0.00 %         | 52.63 % | 51.92 % | 49.21 % | 41.44 % | 40.85 % | 30.30 % | 38.05 % |
|                              | X                                                   | 33.33 %   | 23.31 % | 39.56 % | 34.81 % | 39.64 % | 34.81 % | 47.19 % | -       | 0.00 %         | 54.14 % | 45.33 % | 45.24 % | 36.94 % | 40.44 % | 32.47 % | -       |
| PID_4                        | Medicines                                           | 33.33 %   | 26.32 % | 26.92 % | 28.57 % | 36.04 % | 29.58 % | 48.48 % | 32.75 % | 0.00 %         | 63.16 % | 63.46 % | 60.32 % | 45.05 % | 47.89 % | 33.33 % | 44.74 % |
|                              | Pharmaceutical products                             | 33.33 %   | 15.79 % | 36.54 % | 36.51 % | 37.84 % | 36.62 % | 54.55 % | 35.88 % | 0.00 %         | 57.89 % | 44.23 % | 46.83 % | 36.94 % | 36.62 % | 24.24 % | 35.25 % |
|                              | Medical consumables                                 | 33.33 %   | 15.79 % | 40.38 % | 41.27 % | 41.44 % | 35.21 % | 45.45 % | 36.13 % | 0.00 %         | 57.89 % | 30.77 % | 36.51 % | 27.93 % | 28.17 % | 27.27 % | 29.79 % |
|                              | Laboratory consumables                              | 33.33 %   | 26.32 % | 40.38 % | 40.48 % | 39.64 % | 35.21 % | 45.45 % | 37.26 % | 0.00 %         | 42.11 % | 30.77 % | 37.30 % | 28.83 % | 28.17 % | 27.27 % | 27.78 % |
|                              | Drug interactions                                   | 33.33 %   | 31.58 % | 36.54 % | 34.13 % | 37.84 % | 36.62 % | 33.33 % | 34.77 % | 0.00 %         | 52.63 % | 46.15 % | 48.41 % | 39.64 % | 39.44 % | 42.42 % | 38.39 % |
|                              | Dosage                                              | 33.33 %   | 31.58 % | 34.62 % | 30.95 % | 36.94 % | 33.80 % | 39.39 % | 34.37 % | 0.00 %         | 52.63 % | 53.85 % | 53.17 % | 41.44 % | 43.66 % | 39.39 % | 40.59 % |
|                              | Technical information about healthcare technologies | 33.33 %   | 15.79 % | 42.31 % | 38.10 % | 40.54 % | 33.80 % | 30.30 % | 33.45 % | 0.00 %         | 52.63 % | 38.46 % | 41.27 % | 32.43 % | 35.21 % | 36.36 % | 33.77 % |
|                              | X                                                   | 33.33 %   | 23.31 % | 36.81 % | 35.71 % | 38.61 % | 34.41 % | 42.42 % | -       | 0.00 %         | 54.14 % | 43.96 % | 46.26 % | 36.04 % | 37.02 % | 32.90 % | -       |
| PID_5                        | Access to emergency services                        | 33.33 %   | 31.58 % | 25.00 % | 34.92 % | 32.43 % | 25.35 % | 33.33 % | 30.85 % | 0.00 %         | 57.89 % | 57.69 % | 49.21 % | 48.65 % | 50.70 % | 45.45 % | 44.23 % |
|                              | Access to appointments                              | 33.33 %   | 36.84 % | 26.92 % | 34.92 % | 36.04 % | 30.99 % | 36.36 % | 33.63 % | 0.00 %         | 52.63 % | 55.77 % | 50.79 % | 45.95 % | 47.89 % | 45.45 % | 42.64 % |
|                              | Access to treatments                                | 33.33 %   | 31.58 % | 26.92 % | 34.92 % | 35.14 % | 30.99 % | 36.36 % | 32.75 % | 0.00 %         | 52.63 % | 59.62 % | 50.00 % | 46.85 % | 47.89 % | 48.48 % | 43.64 % |
|                              | Access to surgeries                                 | 33.33 %   | 26.32 % | 26.92 % | 33.33 % | 37.84 % | 32.39 % | 36.36 % | 32.36 % | 0.00 %         | 63.16 % | 57.69 % | 51.59 % | 44.14 % | 46.48 % | 48.48 % | 44.51 % |

| Primary information category | Secondary information category                           | Important |         |         |         |         |         |         |         | Very important |         |         |         |         |         |         |         |
|------------------------------|----------------------------------------------------------|-----------|---------|---------|---------|---------|---------|---------|---------|----------------|---------|---------|---------|---------|---------|---------|---------|
|                              |                                                          | ≤ 18      | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | Σ       | ≤ 18           | 19 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | ≥ 65    | Σ       |
|                              | $\bar{X}$                                                | 33.33 %   | 31.58 % | 26.44 % | 34.52 % | 35.36 % | 29.93 % | 35.61 % | -       | 0.00 %         | 56.58 % | 57.69 % | 50.40 % | 46.40 % | 48.24 % | 46.97 % | -       |
| PID_6                        | Cost with complementary diagnostic and therapeutic exams | 33.33 %   | 36.84 % | 44.23 % | 38.10 % | 33.33 % | 33.80 % | 36.36 % | 36.57 % | 0.00 %         | 31.58 % | 36.54 % | 39.68 % | 27.93 % | 29.58 % | 27.27 % | 27.51 % |
|                              | Cost with medicines                                      | 33.33 %   | 36.84 % | 40.38 % | 40.48 % | 36.94 % | 29.58 % | 36.36 % | 36.27 % | 0.00 %         | 42.11 % | 48.08 % | 39.68 % | 28.83 % | 30.99 % | 27.27 % | 30.99 % |
|                              | Cost with pharmaceutical products                        | 33.33 %   | 36.84 % | 36.54 % | 42.86 % | 37.84 % | 35.21 % | 36.36 % | 37.00 % | 0.00 %         | 31.58 % | 46.15 % | 34.92 % | 27.03 % | 22.54 % | 27.27 % | 27.07 % |
|                              | Cost with medical consumables                            | 33.33 %   | 36.84 % | 38.46 % | 38.89 % | 39.64 % | 33.80 % | 33.33 % | 36.33 % | 0.00 %         | 36.84 % | 34.62 % | 30.95 % | 21.62 % | 26.76 % | 27.27 % | 25.44 % |
|                              | Cost with laboratory consumables                         | 33.33 %   | 42.11 % | 36.54 % | 38.89 % | 40.54 % | 33.80 % | 33.33 % | 36.93 % | 0.00 %         | 31.58 % | 34.62 % | 30.16 % | 21.62 % | 26.76 % | 27.27 % | 24.57 % |
|                              | Cost with human resources                                | 33.33 %   | 26.32 % | 34.62 % | 34.13 % | 38.74 % | 32.39 % | 39.39 % | 34.13 % | 0.00 %         | 42.11 % | 34.62 % | 34.92 % | 24.32 % | 28.17 % | 24.24 % | 26.91 % |
|                              | $\bar{X}$                                                | 33.33 %   | 35.96 % | 38.46 % | 38.89 % | 37.84 % | 33.10 % | 35.86 % | -       | 0.00 %         | 35.96 % | 39.10 % | 35.05 % | 25.23 % | 27.46 % | 26.77 % | -       |
| PID_7                        | Average time of appointment                              | 33.33 %   | 42.11 % | 28.85 % | 35.71 % | 38.74 % | 35.21 % | 42.42 % | 36.62 % | 0.00 %         | 42.11 % | 36.54 % | 42.06 % | 31.53 % | 32.39 % | 27.27 % | 30.27 % |
|                              | Average time of treatment                                | 33.33 %   | 42.11 % | 40.38 % | 34.13 % | 38.74 % | 36.62 % | 42.42 % | 38.25 % | 0.00 %         | 36.84 % | 38.46 % | 45.24 % | 32.43 % | 32.39 % | 27.27 % | 30.38 % |
|                              | Average time of waiting                                  | 33.33 %   | 36.84 % | 30.77 % | 34.13 % | 38.74 % | 36.62 % | 39.39 % | 35.69 % | 0.00 %         | 36.84 % | 46.15 % | 46.83 % | 29.73 % | 32.39 % | 33.33 % | 32.18 % |
|                              | Average time of management and administration            | 33.33 %   | 36.84 % | 26.92 % | 34.92 % | 36.04 % | 39.44 % | 45.45 % | 36.14 % | 0.00 %         | 36.84 % | 40.38 % | 41.27 % | 28.83 % | 22.54 % | 24.24 % | 27.73 % |
|                              | $\bar{X}$                                                | 33.33 %   | 39.47 % | 31.73 % | 34.72 % | 38.06 % | 36.97 % | 42.42 % | -       | 0.00 %         | 38.16 % | 40.38 % | 43.85 % | 30.63 % | 29.93 % | 28.03 % | -       |

**Annex XXVII – PLS-SEM's theoretical model about healthcare professionals' perspectives of the electronic system in use to access healthcare data in the Azores archipelago**

Figure 27. PLS-SEM's theoretical model about healthcare professionals' perspectives of the electronic system in use to access healthcare data in the Azores archipelago



## Annex XXVIII – Healthcare professionals' outer loadings values and average values for PID and PUD

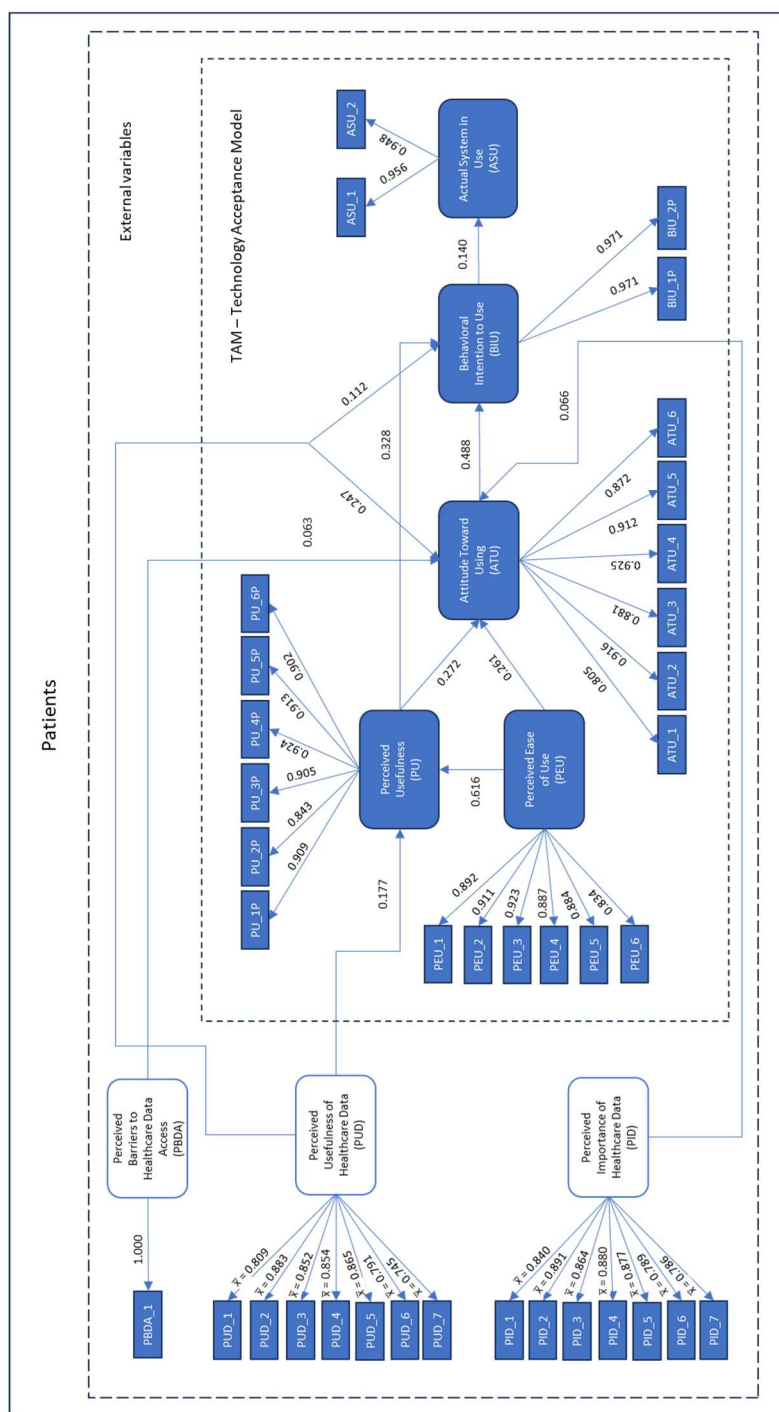
Table 59. Healthcare professionals' outer loadings values and average values for PID and PUD

| Primary category                                 | Secondary category                                  | Importance     |           | Utility        |           |
|--------------------------------------------------|-----------------------------------------------------|----------------|-----------|----------------|-----------|
|                                                  |                                                     | Outer loadings | $\bar{X}$ | Outer loadings | $\bar{X}$ |
| Diagnostic and evaluation of patients' health    | Anthropometric evaluation                           | 0.722          |           | 0.673          |           |
|                                                  | Laboratory tests                                    | 0.768          |           | 0.642          |           |
|                                                  | Imaging exams                                       | 0.781          |           | 0.693          |           |
|                                                  | Rapid tests                                         | 0.749          | 0.781     | 0.752          | 0.712     |
|                                                  | Physical exams                                      | 0.814          |           | 0.706          |           |
|                                                  | Electrocardiogram                                   | 0.827          |           | 0.765          |           |
|                                                  | Vital parameters                                    | 0.806          |           | 0.751          |           |
| Patients' treatments                             | Medicines                                           | 0.686          |           | 0.751          |           |
|                                                  | Pharmaceutical products                             | 0.744          |           | 0.747          |           |
|                                                  | Medical consumables                                 | 0.710          |           | 0.702          |           |
|                                                  | Laboratory consumables                              | 0.710          | 0.703     | 0.694          | 0.737     |
|                                                  | Drug interactions                                   | 0.688          |           | 0.751          |           |
|                                                  | Dosage                                              | 0.744          |           | 0.775          |           |
|                                                  | Technical information about healthcare technologies | 0.640          |           | 0.735          |           |
| Prevention and promotion of patients' health     | Vaccination and immunization                        | 0.624          |           | 0.631          |           |
|                                                  | Screenings                                          | 0.669          |           | 0.754          |           |
|                                                  | Diet                                                | 0.707          |           | 0.756          |           |
|                                                  | Physical activity                                   | 0.680          | 0.700     | 0.794          | 0.759     |
|                                                  | Antimicrobial resistance                            | 0.729          |           | 0.805          |           |
|                                                  | Smoking                                             | 0.782          |           | 0.785          |           |
|                                                  | Epidemiology                                        | 0.711          |           | 0.791          |           |
| Patients' general information                    | Allergies and intolerances                          | 0.651          |           | 0.638          |           |
|                                                  | Demography                                          | 0.622          |           | -              |           |
|                                                  | Pregnancy                                           | 0.632          |           | 0.642          |           |
|                                                  | Habits                                              | 0.631          | 0.644     | 0.665          | 0.648     |
|                                                  | Clinical and family history                         | 0.657          |           | 0.662          |           |
|                                                  | Identification                                      | 0.635          |           | -              |           |
|                                                  | Death                                               | 0.659          |           | -              |           |
|                                                  | Pathologies                                         | 0.665          |           | 0.632          |           |
| Accessibility of patients to healthcare services | Access to emergency services                        | -              |           | 0.692          |           |
|                                                  | Access to appointments                              | -              |           | 0.725          |           |
|                                                  | Access to treatments                                | -              | -         | 0.737          | 0.720     |
|                                                  | Access to surgeries                                 | -              |           | 0.725          |           |

| Primary category                        | Secondary category                                       | Importance     |           | Utility        |           |
|-----------------------------------------|----------------------------------------------------------|----------------|-----------|----------------|-----------|
|                                         |                                                          | Outer loadings | $\bar{X}$ | Outer loadings | $\bar{X}$ |
| Financial resources spent on healthcare | Cost with complementary diagnostic and therapeutic exams | -              |           | 0.749          |           |
|                                         | Cost with medicines                                      | -              |           | 0.736          |           |
|                                         | Cost with pharmaceutical products                        | -              | -         | 0.751          | 0.755     |
|                                         | Cost with medical consumables                            | -              |           | 0.772          |           |
|                                         | Cost with laboratory consumables                         | -              |           | 0.759          |           |
|                                         | Cost with human resources                                | -              |           | 0.764          |           |
| Temporal resources spent on healthcare  | Average time of appointment                              | -              |           | 0.679          |           |
|                                         | Average time of treatment                                | -              | -         | 0.711          | 0.695     |
|                                         | Average time of waiting                                  | -              |           | 0.692          |           |
|                                         | Average time of management and administration            | -              |           | 0.700          |           |

## Annex XXIX – PLS-SEM’s theoretical model about patients’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago

Figure 28. PLS-SEM’s theoretical model about patients’ perspectives of the electronic system in use to access healthcare data in the Azores archipelago



## Annex XXX – Patients' outer loadings values and average values for PID and PUD

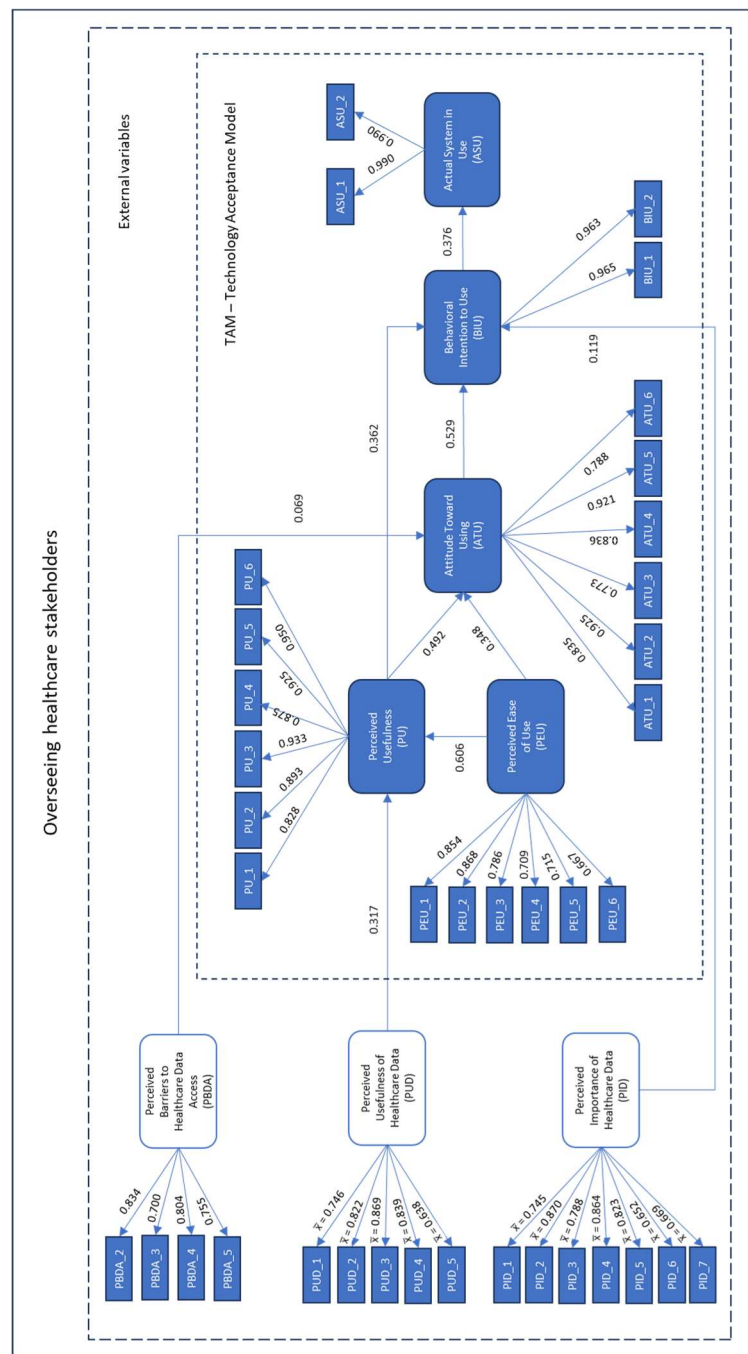
Table 60. Patients' outer loadings values and average values for PID and PUD

| Primary category                                 | Secondary category                                       | Importance     |           | Utility        |           |
|--------------------------------------------------|----------------------------------------------------------|----------------|-----------|----------------|-----------|
|                                                  |                                                          | Outer loadings | $\bar{X}$ | Outer loadings | $\bar{X}$ |
| Diagnostic and evaluation of patients' health    | Anthropometric evaluation                                | 0.831          |           | 0.837          |           |
|                                                  | Laboratory tests                                         | 0.908          |           | 0.888          |           |
|                                                  | Imaging exams                                            | 0.903          |           | 0.891          |           |
|                                                  | Rapid tests                                              | 0.897          | 0.891     | 0.886          | 0.883     |
|                                                  | Physical exams                                           | 0.908          |           | 0.895          |           |
|                                                  | Electrocardiogram                                        | 0.896          |           | 0.894          |           |
|                                                  | Vital parameters                                         | 0.898          |           | 0.892          |           |
| Patients' treatments                             | Medicines                                                | 0.889          |           | 0.858          |           |
|                                                  | Pharmaceutical products                                  | 0.884          |           | 0.854          |           |
|                                                  | Medical consumables                                      | 0.845          |           | 0.815          |           |
|                                                  | Laboratory consumables                                   | 0.852          | 0.880     | 0.819          | 0.854     |
|                                                  | Drug interactions                                        | 0.903          |           | 0.897          |           |
|                                                  | Dosage                                                   | 0.909          |           | 0.871          |           |
|                                                  | Technical information about healthcare technologies      | 0.879          |           | 0.864          |           |
| Prevention and promotion of patients' health     | Vaccination and immunization                             | 0.850          |           | 0.857          |           |
|                                                  | Screenings                                               | 0.888          |           | 0.870          |           |
|                                                  | Diet                                                     | 0.849          |           | 0.832          |           |
|                                                  | Physical activity                                        | 0.831          | 0.864     | 0.814          | 0.852     |
|                                                  | Antimicrobial resistance                                 | 0.891          |           | 0.884          |           |
|                                                  | Smoking                                                  | 0.842          |           | 0.818          |           |
|                                                  | Epidemiology                                             | 0.900          |           | 0.887          |           |
| Patients' general information                    | Allergies and intolerances                               | 0.879          |           | 0.859          |           |
|                                                  | Demography                                               | 0.782          |           | 0.689          |           |
|                                                  | Pregnancy                                                | 0.821          |           | 0.803          |           |
|                                                  | Habits                                                   | 0.853          | 0.840     | 0.806          | 0.833     |
|                                                  | Clinical and family history                              | 0.894          |           | 0.889          |           |
|                                                  | Identification                                           | 0.831          |           | 0.786          |           |
|                                                  | Death                                                    | 0.779          |           | 0.757          |           |
|                                                  | Pathologies                                              | 0.884          |           | 0.883          |           |
| Accessibility of patients to healthcare services | Access to emergency services                             | 0.862          |           | 0.863          |           |
|                                                  | Access to appointments                                   | 0.881          | 0.877     | 0.850          | 0.865     |
|                                                  | Access to treatments                                     | 0.885          |           | 0.872          |           |
|                                                  | Access to surgeries                                      | 0.880          |           | 0.875          |           |
| Financial resources spent on healthcare          | Cost with complementary diagnostic and therapeutic exams | 0.772          | 0.789     | 0.796          | 0.791     |

| Primary category                       | Secondary category                            | Importance     |           | Utility        |           |
|----------------------------------------|-----------------------------------------------|----------------|-----------|----------------|-----------|
|                                        |                                               | Outer loadings | $\bar{X}$ | Outer loadings | $\bar{X}$ |
|                                        | Cost with medicines                           | 0.811          |           | 0.820          |           |
|                                        | Cost with pharmaceutical products             | 0.802          |           | 0.820          |           |
|                                        | Cost with medical consumables                 | 0.795          |           | 0.781          |           |
|                                        | Cost with laboratory consumables              | 0.786          |           | 0.776          |           |
|                                        | Cost with human resources                     | 0.766          |           | 0.755          |           |
| Temporal resources spent on healthcare | Average time of appointment                   | 0.767          |           | 0.748          |           |
|                                        | Average time of treatment                     | 0.805          | 0.786     | 0.773          | 0.745     |
|                                        | Average time of waiting                       | 0.799          |           | 0.735          |           |
|                                        | Average time of management and administration | 0.772          |           | 0.724          |           |

# Annex XXXI – PLS-SEM's theoretical model about overseeing healthcare stakeholders' perspectives of the electronic system in use to access healthcare data in the Azores archipelago

Figure 29. PLS-SEM's theoretical model about overseeing healthcare stakeholders' perspectives of the electronic system in use to access healthcare data in the Azores archipelago



## Annex XXXII – Overseeing healthcare stakeholders' outer loadings values and average values for PID and PUD

Table 61. Overseeing healthcare stakeholders' outer loadings values and average values for PID and PUD

| Primary category                                 | Secondary category                                  | Importance     |           | Utility        |           |
|--------------------------------------------------|-----------------------------------------------------|----------------|-----------|----------------|-----------|
|                                                  |                                                     | Outer loadings | $\bar{X}$ | Outer loadings | $\bar{X}$ |
| Diagnostic and evaluation of patients' health    | Anthropometric evaluation                           | 0.874          |           | 0.830          |           |
|                                                  | Laboratory tests                                    | 0.911          |           | 0.867          |           |
|                                                  | Imaging exams                                       | 0.844          |           | 0.842          |           |
|                                                  | Rapid tests                                         | 0.828          | 0.870     | 0.766          | 0.822     |
|                                                  | Physical exams                                      | 0.868          |           | 0.827          |           |
|                                                  | Electrocardiogram                                   | 0.894          |           | 0.775          |           |
|                                                  | Vital parameters                                    | 0.870          |           | 0.844          |           |
| Patients' treatments                             | Medicines                                           | 0.894          |           | 0.870          |           |
|                                                  | Pharmaceutical products                             | 0.845          |           | 0.815          |           |
|                                                  | Medical consumables                                 | 0.808          |           | -              |           |
|                                                  | Laboratory consumables                              | 0.843          | 0.864     | -              | 0.839     |
|                                                  | Drug interactions                                   | 0.906          |           | 0.911          |           |
|                                                  | Dosage                                              | 0.901          |           | 0.803          |           |
|                                                  | Technical information about healthcare technologies | 0.855          |           | 0.794          |           |
| Prevention and promotion of patients' health     | Vaccination and immunization                        | 0.903          |           | 0.844          |           |
|                                                  | Screenings                                          | 0.736          |           | 0.841          |           |
|                                                  | Diet                                                | 0.675          |           | 0.849          |           |
|                                                  | Physical activity                                   | 0.690          | 0.788     | 0.841          | 0.869     |
|                                                  | Antimicrobial resistance                            | 0.914          |           | 0.906          |           |
|                                                  | Smoking                                             | 0.749          |           | 0.899          |           |
|                                                  | Epidemiology                                        | 0.852          |           | 0.904          |           |
| Patients' general information                    | Allergies and intolerances                          | 0.803          |           | 0.787          |           |
|                                                  | Demography                                          | 0.609          |           | -              |           |
|                                                  | Pregnancy                                           | 0.739          |           | 0.775          |           |
|                                                  | Habits                                              | 0.775          | 0.745     | 0.752          | 0.746     |
|                                                  | Clinical and family history                         | 0.788          |           | 0.698          |           |
|                                                  | Identification                                      | 0.719          |           | -              |           |
|                                                  | Death                                               | -              |           | -              |           |
|                                                  | Pathologies                                         | 0.783          |           | 0.719          |           |
| Accessibility of patients to healthcare services | Access to emergency services                        | 0.818          |           | 0.603          |           |
|                                                  | Access to appointments                              | 0.855          | 0.823     | 0.658          | 0.638     |
|                                                  | Access to treatments                                | 0.849          |           | 0.649          |           |
|                                                  | Access to surgeries                                 | 0.770          |           | 0.641          |           |

| Primary category                        | Secondary category                                       | Importance     |           | Utility        |           |
|-----------------------------------------|----------------------------------------------------------|----------------|-----------|----------------|-----------|
|                                         |                                                          | Outer loadings | $\bar{X}$ | Outer loadings | $\bar{X}$ |
| Financial resources spent on healthcare | Cost with complementary diagnostic and therapeutic exams | 0.670          |           | -              |           |
|                                         | Cost with medicines                                      | 0.633          |           | -              |           |
|                                         | Cost with pharmaceutical products                        | -              | 0.652     | -              | -         |
|                                         | Cost with medical consumables                            | -              |           | -              |           |
|                                         | Cost with laboratory consumables                         | -              |           | -              |           |
|                                         | Cost with human resources                                | -              |           | -              |           |
| Temporal resources spent on healthcare  | Average time of appointment                              | 0.603          |           | -              |           |
|                                         | Average time of treatment                                | 0.725          | 0.669     | -              | -         |
|                                         | Average time of waiting                                  | 0.678          |           | -              |           |
|                                         | Average time of management and administration            | -              |           | -              |           |

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