

EPIDEMIOLOGICAL ANALYSIS OF ADMISSIONS FOR ACUTE MYOCARDIAL INFARCTION IN THE STATE OF PIAUÍ FROM 2014 TO 2023

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Abstract: Brazil, although still developing, has sociodemographic and health characteristics similar to those of developed countries, such as a predominance of chronic non-communicable diseases, among which Acute Myocardial Infarction (AMI) is one of the biggest causes of morbidity and mortality in the national territory. The study aimed to analyze the epidemiology of hospitalizations for AMI in the state of Piauí from 2014 to 2023. The research used a documentary, observational, retrospective descriptive and qualitative-quantitative epidemiological approach. Data were collected from the Hospital Morbidity Information System (SIH/SUS) via DATASUS, covering hospitalizations for AMI in Piauí from 2014 to 2023. The variables studied included age group, sex, race, nature of hospitalization and number of deaths. The data were organized in Excel® spreadsheets and analyzed using descriptive statistics. The highest number of cases was registered in 2022 (11.84%). The majority of cases were men (64.28%) and aged between 60 and 69 years (29.53%). The brown race predominated among the cases (49.67%). The majority of hospitalizations occurred urgently (93%). There was an annual average of 135.9 deaths, with 2022 recording the highest number (161 deaths, 11.85%). The data indicate a growing trend in hospitalizations for AMI in Piauí, especially in 2022. The epidemiological profile of those hospitalized is mostly made up of brown men aged 60 to 69 years. The high proportion of emergency admissions reflects the severity of the AMI. Stability in annual mortality suggests a continued need for improvements in prevention and treatment strategies. This study highlights the importance of interventions targeting cardiovascular risk factors to reduce morbidity and mortality associated with AMI.

Keywords: Epidemiology, Acute myocardial infarction, Morbidity, Mortality. Biostatistics

INTRODUCTION

Brazil is a country that, despite still being in the development phase, has sociodemographic and health characteristics similar to those of developed countries. This was due to its sociodemographic transition that occurred from the 1970s onwards with the late urbanization process and reached its peak after the consolidation of the Unified Health System in the 1990s.

This trajectory culminated in the epidemiological replacement of infectious diseases by chronic non-communicable diseases (NCDs), which today are responsible for approximately 76% of the causes of death in the country (Malta et al., 2021).

Among NCDs, cardiovascular diseases are the most prevalent in the general Brazilian population. There will be around 400,000 deaths in 2022 (Ministry of Health, 2023). In this context, among the biggest causes of morbidity and mortality in the country is Acute Myocardial Infarction (AMI), which corresponds to an acute obstruction of a coronary artery due to the formation of a thrombus, usually on a pre-existing atherosclerotic plaque. This leads to interruption of blood flow to a part of the heart muscle, causing ischemia, prolonged ischemia results in cell injury and death (Bett et al., 2020).

In this context, AMI is one of the main causes of mortality both in Brazil and worldwide, it is considered the cardiovascular disease that results most in deaths in the first hours after the onset of symptoms. Around 65% of AMI-related deaths occur within the first hour, and approximately 80% occur within the first 24 hours after the onset of symptoms (Brum Freitas; Chiogna Padilha, 2021).

In this context, data collected from the Information Technology Department of the Unified Health System (DATASUS) records between 2010 and 2021, they resulted in a total

of 1,066,194 hospitalizations diagnosed due to AMI (Brazil, 2021; Brum Freitas; Chiogna Padilha, 2021). This increase in the number of cases can be justified due to the changes in socio-epidemiological patterns that Brazilian society has undergone in recent years, in which the number of obese and sedentary individuals has increased, which are risk factors for the emergence of cardiovascular changes that can culminate at IAM. Because of this, studying the epidemiology of the disease is essential for optimizing prevention and intervention strategies against this disease (Bussons; Santo; Gonçalves, 2022).

From this perspective, it is observed that women are at risk for the development of anxious symptoms and that the pathology requires treatment, whether medication or non-medication, such as psychotherapy. However, complementary practices such as auriculotherapy can enhance therapy and contribute holistic way with the rehabilitation of these patients (Silva et al., 2021).

By knowing this issue, the research is justified due to the need to expand studies on AMI, since this disease is one of the most common in the national epidemiological scenario. Therefore, the article aimed to analyze the epidemiology of hospital admissions due to AMI in the state of Piauí from 2014 to 2023.

OBJECTIVES

MAIN OBJECTIVE

To analyze the epidemiology of hospital admissions due to AMI in the state of Piauí from 2014 to 2023.

SPECIFIC OBJECTIVES

- Identify the year with the highest number of cases and the annual average;
- Check: gender; age group; race; character of service;
- Register the number of deaths related

to hospitalizations due to AMI in the state of Piauí from 2014 to 2023.

METHODOLOGY

As it consists of an epidemiological study, the data that were analyzed in the research came from publicly accessible databases, which does not allow the identification of subjects. Therefore, approval from the Research Ethics Committee of the UNINOVAFAPI University Center was not necessary, since the data were obtained directly from the Hospital Morbidity Information System (SIH/SUS). However, the researchers followed the guidelines proposed by resolutions Number 466/12 and Number 510/16 for research involving human beings, in order to ensure that the study brings benefits to the community and respects human dignity, even when using data from health data systems.

The research in question adopted epidemiological analysis as its methodological approach: documentary, observational, descriptive, retrospective and qualitative-quantitative (Toassi; Petry, 2021). Data were used from the Hospital Morbidity Information System (SIH/SUS), accessible through the DATASUS System, under the responsibility of the Ministry of Health. A study was carried out that covered confirmed cases of hospital admissions due to AMI in the state of Piauí from 2014 to 2023.

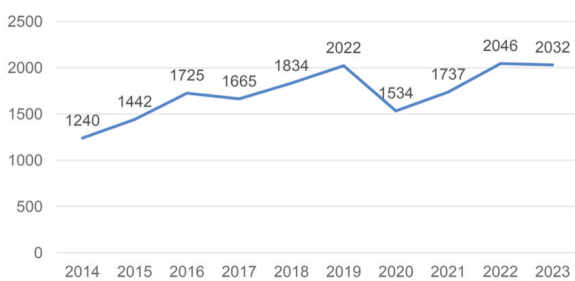
Data extraction occurred as follows: first, the DATASUS page was accessed and the “Health Information (TABNET)” section was consulted, then clicking on “Epidemiology and Morbidity”. The link “SUS Hospital Morbidity (SIH/SUS)” was selected and, subsequently, the option “General, by place of residence from 2008”. The geographical coverage chosen was the state of Piauí. It is noteworthy that the period investigated was selected and, in the ICD-10 Morbidity list, Acute Myocardial Infarction was chosen.

With the TABNET tool, data collection began based on the variables to be studied, which were: age group, sex, race, nature of hospitalization, number of deaths. According to Jesus-Lopes; Maciel; Casagrande (2022), such sociodemographic variables are fundamental and basic epidemiological parameters to be observed in epidemiological studies, as these variables are capable of describing Socio epidemiological profiles and identifying groups that are most vulnerable to the disease studied.

The collected data was organized into spreadsheets in Excel® software version 2020 and analyzed using descriptive statistics and percentages based on 100. The results were presented in tables and graphs to make understanding easier.

RESULTS AND DISCUSSIONS

The number of hospitalizations for there was n=17,277 cases of hospital admissions for AMI in the state of Piauí from 2014-2023 with an annual average of n= 1,727.7 cases. Graph 1 shows the cases of hospital admissions due to AMI in the state of Piauí from 2014 to 2023, according to the year of occurrence.



Graph 1: Confirmed cases of hospital admissions due to AMI, according to the year of occurrence. Piauí. 2014-2023 (n= 17,277).

Source: Ministry of Health - SUS Hospital Information System (SIH/SUS) (2024).

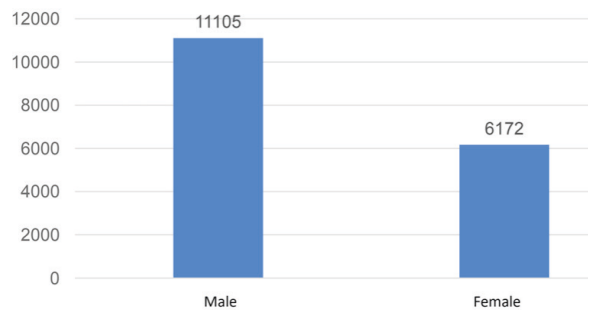
According to the graph, the year with the highest number of cases was 2022 with n=2,046 cases (11.84%), followed by 2023 with n= 2,032 cases (11.76%). The year with

the lowest number of registered cases was 2014 with n= 1,240 cases (7.18%).

Lopes Dias et al. (2022) in their retrospective study (2011 to 2020) on cases of AMI in the national territory observed that there was also an increasing number of cases of hospitalization for AMI in Brazil, with a record of 1,047,309. The Lima study; Maximum; Araujo Filho (2023) identified 8,595 cases of hospital admissions due to AMI in the state of Piauí from 2015 to 2029, which corroborates what was assessed in the study regarding the tendency for the number of cases to increase.

Another fact to be observed is the decrease in the number of cases for the year 2020, which according to Formigosa; Brito; grandson (2022) occurred due to cases of underreporting of illnesses and not due to a spontaneous reduction, which can be proven by the increase in the number of cases in the following years.

Graph 2 shows the cases of hospital admissions due to AMI in the state of Piauí from 2014 to 2023, according to sex.



Graph 2: Confirmed cases of hospital admissions due to AMI, according to sex. Piauí. 2014-2023 (n= 17,277).

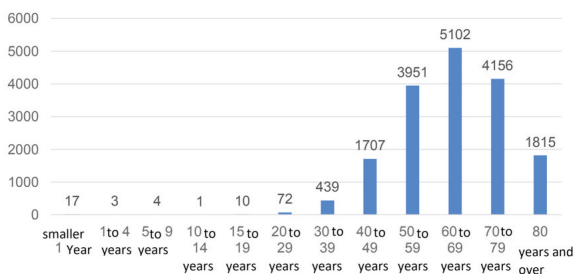
Source: Ministry of Health - SUS Hospital Information System (SIH/SUS) (2024).

According to the graph, the highest number of cases was recorded in males with n= 11,105 cases (64.28%), while females had n= 6,172 cases (35.72%). What is presented by the study corroborates the literature, from Lima;

Maximum; Araujo Filho (2023), observed that 63.85% of their sample was made up of male individuals, as well as Brum Freitas; Chiogna Padilha (2021) and Omairi et al. (2023).

Gumede; Ngubane; Khathi (2022) show that this discrepancy can be attributed to several risk factors that are more prevalent or have a greater impact on males, such as lifestyle habits (smoking, alcohol consumption), health conditions (hypertension, diabetes, high cholesterol), and possible biological and hormonal differences that influence cardiovascular health.

Graph 3 shows the cases of hospital admissions due to AMI in the state of Piauí from 2014 to 2023, according to age group.



Graph 3: Confirmed cases of hospital admissions due to AMI, according to age group. Piauí. 2014-2023 (n= 17,277).

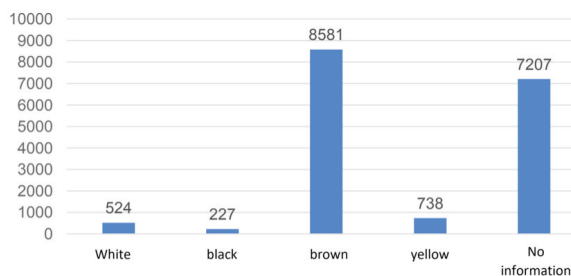
Source: Ministry of Health - SUS Hospital Information System (SIH/SUS) (2024).

According to the graph, the largest number of cases was recorded in the age group from 60 to 69 years old with n= 5,102 cases (29.53%), followed by the age group from 70 to 79 years old with n= 4,156 cases (25.06%). Graphical inference shows that most cases occur with advancing age, especially from the fourth decade of life onwards and reach their peak around the sixth decade (Variza, 2023).

Brito et al., (2022) observed that 30.2% of their sample was made up of individuals aged 60 to 69, as did Miranda et al. (2022), since this age distribution suggests, it is believed that there is a greater occurrence of AMI as age increases. This occurs due to the accumulation

of risk factors combined with senility, lifestyle, and the presence of associated comorbidities.

Graph 4 shows the cases of hospital admissions due to AMI in the state of Piauí from 2014 to 2023, according to race.



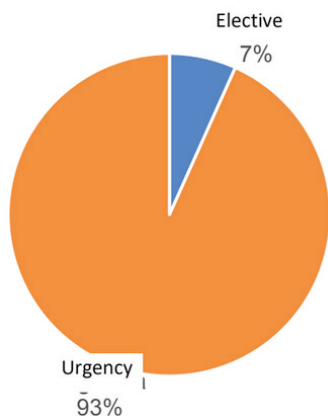
Graph 4: Confirmed cases of hospital admissions due to AMI, according to race. Piauí. 2014-2023 (n= 17,277).

Source: Ministry of Health - SUS Hospital Information System (SIH/SUS) (2024).

According to the graph, the highest number of cases was registered in the brown race with n= 8,581 cases (49.67%), however, another fact that draws attention is the high number of cases without information, a fact that may indicate failures during registration of data from improperly filling out the notification form to powering up the system.

According to IBGE (2022), the majority of the Brazilian population declares themselves mixed race, especially in the Northeast region of Brazil, as is the case in the state of Piauí, therefore, by sampling it is expected that there will be a greater proportion of brown people. Furthermore, such data corroborate the literature, since Paiva Neto et al. (2024) (North Region); Omairi et al. (2023); (South Region) and Carvalho Neto et al., (2022) (Northeast Region) also observed the presence of the majority of their samples composed of brown individuals.

Graph 5 shows the cases of hospital admissions due to AMI in the state of Piauí from 2014 to 2023, according to the type of care.



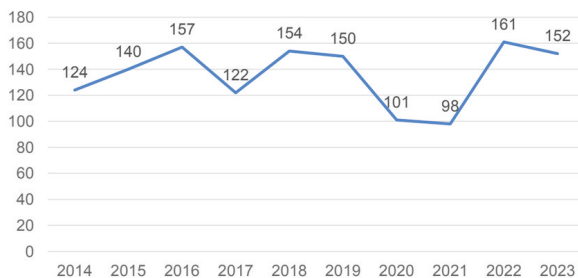
Graph 5: Confirmed cases of hospital admissions due to AMI, according to the type of care. Piauí. 2014-2023 (n= 17,277).

Source: Ministry of Health - SUS Hospital Information System (SIH/SUS) (2024).

According to the graph, the largest number of cases was registered as emergency care with n= 16,119 cases (93%), while elective cases represented 7% of records (n= 1,158 cases).

This reality is corroborated by Brito et al. (2022); Gava et al. (2023), therefore, AMI occurs urgently due to the sudden and serious nature of this condition, which is characterized as a medical emergency that manifests itself abruptly, with intense symptoms such as chest pain, dyspnea and sweating. These clinical manifestations require medical intervention. Furthermore, many patients do not present previous symptoms that lead them to seek preventive medical care, especially since the majority of cases occur in males, who seek medical help only in symptomatic cases.

Graph 6 shows deaths related to hospital admissions due to AMI in the state of Piauí from 2014 to 2023, according to the years of occurrence.



Graph 6: Deaths referring to hospital admissions due to AMI, according to the years of occurrence. Piauí. 2014-2023 (n= 1,359).

Source: Ministry of Health - SUS Hospital Information System (SIH/SUS) (2024).

The graphical inference shows that there was n=1,359 cases of hospital admissions due to AMI in the state of Piauí from 2014-2023 with an annual average of n= 135.9 deaths. According to the graph, there is a tendency for the number of deaths to remain unchanged. The highest number of cases was recorded in the year 2022 with 161 n= (11.85%), followed by the year 2016 with n=154 cases (11.55%). Furthermore, the data shows that the year 2022 presented a greater number of cases than the annual average for the period analyzed.

The trend of maintaining the number of deaths over time may indicate the stability of the general health conditions of the population and the capacity of the health system to deal with cases of AMI. However, the lack of a reduction in annual mortality may also indicate that prevention and treatment approaches need to be improved in order to avoid fatal outcomes (Carvalho Neto et al., 2022).

Furthermore, the increase recorded in 2022 shows that cardiovascular health management still faces major obstacles, and that this increase may indicate emerging or aggravating factors, such as the effects of the COVID-19 pandemic, which may have increased risk factors. cardiovascular diseases and the overload of the health system (Souza; Almeida Silva; Oliveira, 2022).

FINAL CONSIDERATIONS

The state of Piauí showed a trend of increasing the number of hospitalizations for AMI, with emphasis on the year 2022 with the highest number of cases. The epidemiological profile of patients hospitalized for AMI in the state of Piauí from 2014 to 2023 was composed of brown men aged 60 to 69 years hospitalized on an emergency basis. There was an annual average of 135.9 deaths and the year 2022 stands out with the highest number of deaths.

The study aims to expand the existing literature on the topic, as well as stimulate future work that diversifies and discusses the management and epidemiology of AMI in the state of Piauí. Furthermore, the present study suggests that health managers carry out more inspections and training of health professionals on the appropriate completion of notification forms in order to avoid blank data that make epidemiological conclusions difficult, especially in relation to AMI, which is a common pathology in the national epidemiological scenario.

REFERENCES

- BETT, M. S.; ZARDO, J. M.; UTIAMADA, J. L.; RECKZIEGEL, J. L.; SANTOS, V. V. dos. Acute myocardial infarction: From diagnosis to intervention. **Research, Society and Development**, [S. l.], v. 11, n. 3, p. e23811326447, 2022
- BRASIL. Ministério da Saúde. DATASUS. Morbidade hospitalar do SUS - por local de internação - Piauí. 2021. Disponível em: <http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sih/cnv/nise.def>. Acesso em: 29 abr. 2024.
- BRITO, G. M. G. de; SANTOS, K. S. da C.; GOMES, J. V. L.; SANTOS, M. C. N. B.; SANTANA, J. V. L.; SANTOS, J. R. L. de A.; NUNES, A. V. de M.; NUNES, K. C.; SANTOS, J. A.; BRITO, F. B. de. Epidemiological profile of hospitalization for acute myocardial infarction in an emergency care character. **Research, Society and Development**, [S. l.], v. 11, n. 11, p. e35211133706, 2022.
- BRUM FREITAS, R.; CHIOGNA PADILHA, J. Perfil Epidemiológico Do Paciente Com Infarto Agudo Do Miocárdio No Brasil. **Revista De Saúde Dom Alberto**, v. 8, n. 1, p. 100-127, 30 jun. 2021
- BUSSONS, A. J. C.; SANTO, J. N. do E.; GONÇALVES, P. V. V. Aspects risk factors associated with acute myocardial infarction: Systematic review. **Research, Society and Development**, [S. l.], v. 11, n. 16, p. e374111638499, 2022.
- CARVALHO NETO, F. E. C.; MOURA, A. E. A.; CASTRO, A. C. de C.; MARQUES FILHO, F. C. B.; DE MOURA JÚNIOR, M. R. R.; RODRIGUES, A. C. E. Perfil Epidemiológico Dos Pacientes Internados Com Infarto Agudo Do Miocárdio No Estado Do Piauí. **Brazilian Journal of Case Reports**, [S. l.], v. 2, n. Suppl.3, p. 999-1003, 2022.
- FORMIGOSA, C. de A. C.; BRITO, C. V. B.; NETO, O. S. M. Impacto da COVID-19 em doenças de notificação compulsória no Norte do Brasil. **Revista Brasileira em Promoção da Saúde**, [S. l.], v. 35, p. 11, 2022.
- GAVA, F. D.; SILVA, F. B. da; BRANDÃO, K. F.; OLIVEIRA, J. V. O. de; MORAES, D. de A. G. L.; BRAGA, A. C. A.; FONSECA, P. P. de M.; CORRÊA, M. F. rocha; SABARÁ, S. G.; CAMPOS, M. E. S. ANÁLISE DO PERFIL EPIDEMIOLÓGICO DE PACIENTES INTERNADOS POR INFARTO AGUDO DO MIOCÁRDIO NO ESPÍRITO SANTO ENTRE 2017 A 2022. **Brazilian Journal of Implantology and Health Sciences**, [S. l.], v. 5, n. 5, p. 2981-2989, 2023.
- GUMEDE, N.; NGUBANE, P.; KHATHI, A. Assessing the risk factors for myocardial infarction in diet-induced prediabetes: myocardial tissue changes. **BMC cardiovascular disorders**, v. 22, n. 1, p. 350, 2022.
- JESUS-LOPES, J.C; MACIEL, W.R.E; CASAGRANDA, T.G. Check-list dos elementos constituintes dos delineamentos das pesquisas científicas. **Desafio Online**, v. 10, n. 1, 2022.
- LIMA, J. V. S.; MÁXIMO, L. W. M.; ARAUJO FILHO, A. C. A. Internações E Óbitos Por Infarto Agudo Do Miocárdio Em Estado Do Nordeste Brasileiro. **Rev. Rede cuid. saúde**, p. 15-24, 2023.

LOPES DIAS, J.; DE, R.; FREITAS, F.; PICONE BORGES DE ARAGÃO, I.. Análise epidemiológica de infarto agudo do miocárdio e outras doenças isquêmicas do coração no Brasil nos últimos 10 anos. **Revista de Saúde**, [S. l.], v. 13, n. 1, p. 73–77, 2022.

MALTA, D. C.; D. C., Gomes, C. S., Barros, M. B. de A., Lima, M. G., Almeida, W. da S., Sá, A. C. M. G. N. de., Prates, E. J. S., Machado, Í. E., Silva, D. R. P. da., Werneck, A. de O., Damacena, G. N., Souza Júnior, P. R. B. de., Azevedo, L. O. de., Montilla, D. E. R.; Szwarcwald, C. L. Doenças crônicas não transmissíveis e mudanças nos estilos de vida durante a pandemia de COVID-19 no Brasil. **Revista Brasileira de Epidemiologia**, v. 24, p. e210009, 2021.

MINISTÉRIO DA SAÚDE DO BRASIL. (2023). **Cerca de 400 mil pessoas morreram em 2022 no Brasil por problemas cardiovasculares**. Disponível em: <https://bvsmms.saude.gov.br/cerca-de-400-mil-peopleas-morreram-em-2022-no-brasil-por-problemas-cardiovasculares/>. Acesso em: 29 abr. 2024.

MIRANDA, A.P; SILVA, J.L.A; DELMIRO, T.I.S; OLIVEIRA, S.Ge. Perfil Epidemiológico De Pacientes Internados Por Infarto Agudo Do Miocárdio Em Hospitais Do Estado De Alagoas. **Caderno de Graduação - Ciências Biológicas e da Saúde - UNIT - ALAGOAS**, [S. l.], v. 7, n. 3, p. 80, 2022.

OLIVEIRA, S. N.; PEREIRA, L. L. L.; RAMOS FILHO, J. B. de L.; ARRAIS FILHO, F. C. de A.; ARAÚJO, L. A.; LUCENA, M. E. S.; SOUZA, G. M. S. de.; SOUZA, L. A. de. Acute ST-segmente uprade myocardial infarction: A review of diagnosis, pathophysiology, epidemiology, morbimortality, complications and management. **Research, Society and Development**, [S. l.], v. 13, n. 2, p. e1113244954, 2024.

OMAIRI, A.; ROSSI, D. L.; ROSSI, L.; FRANCO, C. O PERFIL EPIDEMIOLÓGICO DE INTERNAÇÕES POR INFARTO AGUDO DO MIOCÁRDIO NO ESTADO DO PARANÁ ENTRE 2016 E 2022. **Brazilian Journal of Implantology and Health Sciences**, [S. l.], v. 5, n. 5, p. 6400–6409, 2023.

PAIVA NETO, M. F., LIRA, P. P., CORRÊA, D. D. R. G., SOUZA, T. C., DE BARROS SILVA, M. A. G., DE SOUZA, U. S.; BORGES, S. E. M. Perfil epidemiológico das internações por Infarto Agudo do Miocárdio entre 2019 e 2023. **Brazilian Journal of Implantology and Health Sciences**, v. 6, n. 4, p. 2287–2296, 2024.

SALES FILHO, G.A; DA COSTA, J.M; JÚNIOR, O.S.L. Óbitos por doenças do aparelho circulatório no estado do Acre: uma análise de 2009 a 2019. **Scientia Naturalis**, v. 5, n. 1, 2023.

SOUZA, M.G; ALMEIDA SILVA, S.; OLIVEIRA, S.V. Análise das internações por infarto agudo do miocárdio em Uberlândia durante a pandemia da covid-19. **Saúde. com**, v. 18, n. 4, 2022.

TOASSI, R.F.C; PETRY, O.C. Metodologia científica aplicada à área da Saúde. 2021.

VARIZA, T. Prevalência de hipertensão arterial sistêmica e de outros fatores de risco para doenças cardiovasculares em adultos atendidos na atenção primária à saúde. 2023.