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HOSPITALIZATION AND MORTALITY DUE TO ESSENTIAL HYPERTENSION IN BRAZIL FROM 2014 TO 2023

HOSPITALIZAÇÃO E MORTALIDADE POR HIPERTENSÃO ESSENCIAL NO BRASIL NO PERÍODO DE 2014 A 2023

HOSPITALIZACIÓN Y MORTALIDAD POR HIPERTENSIÓN ESENCIAL EN BRASIL EN EL PERÍODO DE 2014 A 2023

Catia Suely Palmeira[1]
Yasmin Maria Mello Lima[2]
Tassia Teles Santana de Macedo[3]
Simone Cardoso Passos[4]

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Objective: to analyze hospitalization and mortality due to essential hypertension in Brazil from 2014 to 2023. Method: ecological time series study by DATASUS on February 15, 2024. The variables age, gender, color/race, federative unit and care were statistically analyzed. Results: During the period, a total of 511,295 hospitalizations and 8,518 deaths were recorded. There was a 50.1% reduction in hospitalizations and a 43.2% reduction in deaths. Emergency care was more prevalent (93.8%). The São Paulo state stood out with 18.9% of hospitalizations and 21.1% of deaths. There was a predominance of women (58.5%) in the 60-69 age group (22.8%) and of brown color/race (42.0%). Individuals aged 80 or over had a higher mean number of days in hospital. Deaths were also more frequent in women (53.5%), but aged 80 or over (34.0%). Conclusion: there was a reduction in hospitalizations and mortality due to essential hypertension, with variations related to gender, color/race and type of care.

Descriptors: Essential Hypertension. Hospitalization. Mortality.

Objetivo: analisar a hospitalização e mortalidade por hipertensão essencial no Brasil de 2014 a 2023. Método: estudo ecológico de série temporal pelo DATASUS em 15 de fevereiro de 2024. Foram analisadas estatisticamente as variáveis faixa etária, sexo, cor/raça, unidade federativa e atendimento. Resultados: Foram registrados no período 511295 internações e 8.518 óbitos. Observou-se redução de 50,1% nas hospitalizações e 43,2% nos óbitos. O atendimento de urgência foi mais prevalente (93,8%). O estado de São Paulo destacou-se com 18,9% das hospitalizações e 21,1% dos óbitos. Predominaram nas internações, mulheres (58,5%), na faixa etária de 60 a 69 anos (22,8%) e cor/raça parda (42,0%). Indivíduos com 80 anos ou mais tiveram maior média de dias internados. Os óbitos também foram

Corresponding Author: Catia Suely Palmeira, catia_palmeira@yahoo.com.br

[1] Escola Bahiana de Medicina e Saúde Pública. Salvador, BA, Brazil. https://orcid.org/0000-0001-6328-8118.
[2] Escola Bahiana de Medicina e Saúde Pública. Salvador, BA, Brazil. https://orcid.org/0000-0003-1868-9355.
[3] Escola Bahiana de Medicina e Saúde Pública. Salvador, BA, Brazil. https://orcid.org/0000-0003-2423-9844.
[4] Escola Bahiana de Medicina e Saúde Pública. Salvador, BA, Brazil. https://orcid.org/0000-0002-6467-8211.

mais frequentes em mulheres (53,5%), mas com 80 anos ou mais (34,0%). Conclusão: observou-se redução nas hospitalizações e mortalidade por hipertensão essencial, com variações relacionadas ao sexo, cor/raça e caráter de atendimento.

Descritores: Hipertensão Essencial. Hospitalização. Mortalidade.

Objetivo: analizar la hospitalización y la mortalidad por hipertensión esencial en Brasil en el período de 2014 a 2023. Método: estudio de serie temporal ecológica realizado por DATASUS el 15 de febrero de 2024. Las variables grupo de edad, sexo, color/raza, unidad federativa y tipo de atención. Resultados: en el período se registraron 511.295 hospitalizaciones y 8.518 muertes. Se detectó una reducción del 50,1% en las hospitalizaciones y del 43,2% en las muertes. La atención de urgencia fue más prevalente (93,8%). El estado de São Paulo se destacó con el 18,9% de las hospitalizaciones y el 21,1% de las muertes. En las hospitalizaciones, se constató el predominio de mujeres (58,5%), con edad de 60 a 69 años (22,8%) y color/raza parda (42,0%). Las personas de 80 años o más tuvieron un mayor número promedio de días de hospitalización. Las muertes también fueron más frecuentes en mujeres (53,5%), pero con 80 años o más (34,0%). Conclusión: se observó una reducción en las hospitalizaciones y en la la mortalidad por hipertensión esencial, con variaciones relacionadas con el sexo, color/raza y tipo de atención.

Descriptores: Hipertensión Esencial. Hospitalización. Mortalidad.

Introduction

Essential or primary arterial hypertension (AH) is characterized by persistent elevation of blood pressure (BP), i.e. when the maximum and minimum pressures are equal to or exceed 140/90 mmHg[1]. A etiologia da hipertensão envolve a interação complexa de fatores ambientais e fisiopatológicos, e ainda a predisposição genética, afetando vários sistemas orgânicos[2]. Most of the time it is an asymptomatic condition, which can make diagnosis and proper treatment difficult[1].

Recognized as one of the main chronic non-communicable diseases, AH represents an important risk factor for the development of cardiovascular diseases (CVD) and chronic kidney disease, which result in a considerable number of hospitalizations and entail significant socio-economic costs for society and health services[1,3].

Data from the World Health Organization (WHO) indicate that AH is the leading cause of premature death in the world, and that around 1.28 million adults between the ages of 30 and 79 have hypertension. Less than half of these are diagnosed and treated and 46% of them don't know they have the disease[4]. In Brazil, a survey carried out in 2020 by the Ministry of Health found that in all 27 Brazilian capitals, the frequency of self-reported AH medical diagnosis was 25.2%[5].

AH can lead to a progressive deterioration in cardiovascular function and give rise to various complications, such as stroke, acute myocardial infarction (AMI), heart failure (HF) and chronic kidney disease, contributing to a greater risk of hospital admissions and, in more serious cases, mortality[6]. Still in relation to the complications of uncontrolled hypertension, the literature has shown that individuals with CVD are hospitalized for longer and have a higher rate of mortality and premature death, mainly due to lack of adherence to pharmacological treatment[7]. The disease also has a major economic impact on the Unified Health System (Sistema Único de Saúde, SUS), as it is a potential clinical predictor for the worsening of other chronic diseases that require expensive treatments[8].

In relation to costs, there are also medical and socio-economic implications represented by the direct and indirect disease costs resulting from its complications, time off work and early retirements[1,8]. According to these authors, direct costs are related to the use of clinical resources to carry out medical activities and the cost of patients and their families traveling to receive care. Indirect costs, on the other hand, refer to the loss of function and productivity resulting from the health problem, which can affect the patient and their ability to work.

Considering that non-adherence to antihypertensive treatment is one of the main causes of uncontrolled blood pressure and serious

complications, it is important to expand actions in primary care to control the disease, through strategies aimed at raising awareness among the population about the importance of early AH diagnosis and adherence to appropriate treatment. It is also necessary to increase access to health services and medications, as well as to train professionals to work effectively, as these actions will help to prevent serious complications and reduce the morbidity and mortality associated with the disease[1,8].

Knowledge of the variables involved in the occurrence, hospitalization and mortality from AH is essential for planning and implementing public health policies. This information makes it possible to identify the most vulnerable groups and the regions with the highest disease prevalence, to monitor its evolution over time and to evaluate the effectiveness of the measures adopted, supporting more targeted and effective prevention and control actions[9].

Considering the subject's importance, the lack of studies providing information on the general panorama of hospitalizations and mortality due to AH in Brazil, and the fact that the Hospital Information System of the Unified Health System (SIH/SUS) provides this information, this study is relevant and feasible.

This raises the question: what is the hospitalization and mortality profile for essential hypertension in Brazil between 2014 and 2023? This study aimed to analyze the occurrence of hospitalization and mortality due to essential hypertension in Brazil between 2014 and 2023.

Method

This is a descriptive and exploratory ecological time-series study using secondary data on hospitalizations for essential hypertension (ICD 10: I-10) in the Brazilian population, made available by the Department of Informatics of the Unified Health System (DATASUS).

The study population consisted of all cases of hospitalizations and deaths due to essential hypertension in Brazil from January 2014 to December 2023 recorded in DATASUS by the ICD-10 Morb List. The records in the system for the last decade relating to the subject of the study were taken into account. Cases of hospitalization of people aged 20 or over were included and cases of hospitalization with an unknown age group were excluded.

Data was extracted using the DATASUS platform at https://datasus.saude.gov.br/ and the generic public domain tabulator TABNET at https://datasus.saude.gov.br/informacoes-de-saude-tabnet/, which allows data to be organized quickly and access a wide range of information on health in Brazil.

To extract data on hospital morbidity from the SUS (SIH/SUS), the following options were selected: general hospital morbidity, by place of resistance, from 2014 onwards, with Brazil geographically covered by region and federation unit. The following parameters were then selected: row (Region/ Federation Unit), column (variables of interest) year, care, gender, type of care, regime and color/race) and content (hospitalization rate, deaths, mortality rate, length of stay and mean length of stay). The mortality rate is calculated in DATASUS as the ratio between the number of deaths and the number of approved AIH, computed as hospitalizations, in the period, multiplied by 100. The data was extracted in the same way for all the variables and on a single day (15.02.2024) to guarantee the reliability and consistency of the data obtained.

The variables of interest, both for analyzing hospitalization and mortality, were: hospitalization and year of care (2014 to 2023), gender (male and female), age group (20 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, 60 to 69 years, 70 to 79 years, 80 years and over), color/race (White, Black, Brown, Yellow, Indigenous, No information), regime (Public, Private and Unknown), care character (Elective, Emergency), federation unit (Acre, Alagoas, Amapá, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Rondônia, Roraima, Santa Catarina, São Paulo, Sergipe and Tocantins), days and mean length of stay.

The data was processed and analyzed using Excel and Word spreadsheets from the Microsoft Office 2020 software. The analysis used descriptive statistics, using absolute and relative frequencies for both hospitalizations and mortality. The data is presented in figures and tables.

Since the study used secondary data in the public domain, it was not necessary to submit it to and have it approved by the Research Ethics Committee (CEP), in accordance with Resolution 466/12 of the National Health Council (CNS). The use of this data respects the privacy and confidentiality guidelines established for public data.

Results

Table 1 shows data on hospitalizations for essential hypertension by year of care and state in Brazil between 2014 and 2024. Between the years analyzed there were 511,295 hospitalizations, a reduction of 50.1% over the period. In addition, the year with the lowest number of hospitalizations was 2021, during the Covid-19 pandemic. In terms of states, São Paulo had the highest number of hospitalizations (18.9%), followed by Maranhão with 14.2%.

Table 1. Hospitalizations for essential hypertension according to year of care and federation unit in Brazil between 2014 and 2023. (N=511295)

(continued)

Federation Unit	Years										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Acre	187	132	94	94	84	97	71	83	65	115	1022
Alagoas	741	702	690	755	690	575	366	371	232	196	5318
Amapá	123	93	87	92	56	57	36	44	31	26	645
Amazonas	722	833	703	721	819	936	823	822	716	728	7823
Bahia	10033	9886	7484	7225	6506	6234	3627	3123	4199	3924	62241
Ceará	1915	1417	1050	1001	1001	824	522	419	394	368	8911
Federal District	854	589	597	506	592	766	448	477	466	471	5766
Espírito Santo	1800	1443	1197	1156	948	767	505	412	560	418	9206
Goiás	2748	2194	2024	1960	1800	1490	1034	785	710	889	15634
Maranhão	8205	8723	7052	7165	8083	7322	6086	7288	6966	5505	72395
Mato Grosso	1236	773	873	900	803	669	399	429	408	401	6891
Mato Grosso do Sul	818	726	643	669	698	599	473	341	425	437	5829
Minas Gerais	5320	4552	4470	4121	3691	3360	2477	1975	2380	2117	34463
Pará	5678	4535	3770	3787	3726	3563	2562	2531	2931	2740	35823
Paraíba	1279	1030	748	661	658	603	335	327	357	346	6344
Paraná	2894	2387	2383	2502	2555	2517	2216	1762	1915	2109	23240
Pernambuco	3088	2616	2509	2446	2044	2022	1442	1427	1704	1534	20832
Piauí	2178	2118	1942	1615	1472	1335	1000	1016	904	789	14369
Rio de Janeiro	2838	2923	2619	2536	2726	2992	1861	1932	2619	2157	25203
Rio Grande do Norte	367	311	235	256	219	217	98	123	130	115	2071
Rio Grande do Sul	2394	1957	1825	1771	1555	1561	1099	933	1136	1026	15257
Rondônia	1692	1366	1018	1020	954	1098	1026	768	827	883	10652
Roraima	109	89	102	182	147	88	27	46	61	80	931
Santa Catarina	1242	1501	1775	1854	1996	1696	1424	1099	979	1483	15049
São Paulo	14198	12123	11644	10851	10098	9026	7635	6493	7118	7360	96546
Sergipe	613	684	509	564	582	516	356	439	380	422	5065

Table 1. Hospitalizations for essential hypertension according to year of care and federation unit in Brazil between 2014 and 2023. (N=511295) (conclusion)

Federation Unit	Years										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Tocantins	647	512	439	322	338	406	298	265	288	254	3769
Total	73919	66215	58482	56732	54841	51336	38246	35730	38901	36893	511295

Source: Unified Health System Informatics Department (DATASUS).

In the period analyzed, there were 8518 deaths, a reduction of 43.2% between 2014 and 2023. In relation to the Federative Units, the majority showed a reduction in the number of deaths, with the exception of five federative units (Amazonas, Rio Grande do Sul, Santa Catarina and Tocantins). The highest frequency of deaths occurred in São Paulo (21.1%), followed by Bahia (20.1%) (Table 2).

Table 2. Deaths from essential hypertension according to year of care and federation unit in Brazil between 2014 and 2023. (N=8518) (continued)

Region/Federation Unit	Years										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Acre	2	3	3	4	1	5	1	3	1	2	25
Alagoas	26	18	19	29	28	12	12	8	7	8	167
Amapá	1	1	2	2	4	5	2	2	1	-	20
Amazonas	9	16	12	30	55	48	62	56	22	25	335
Bahia	260	279	231	215	158	163	105	105	109	90	1715
Ceará	21	27	21	19	8	14	11	7	8	9	145
Federal District	27	42	21	10	5	2	-	2	2	4	115
Espírito Santo	12	21	11	14	8	6	13	4	8	10	107
Goiás	33	23	16	17	12	14	7	7	6	13	148
Maranhão	65	57	46	48	52	37	22	48	33	43	451
Mato Grosso	13	9	12	8	17	14	4	6	8	3	94
Mato Grosso do Sul	12	7	4	12	15	7	10	11	4	10	92
Minas Gerais	62	39	45	50	45	54	43	36	33	25	432
Pará	36	38	25	31	37	35	37	27	27	28	321
Paraíba	23	15	19	13	13	19	8	15	15	21	161
Paraná	18	14	18	20	11	15	9	12	8	8	133
Pernambuco	65	50	44	67	56	74	55	62	68	48	589
Piauí	23	23	13	14	14	12	8	8	19	12	146
Rio de Janeiro	79	82	88	83	70	66	56	67	61	53	705
Rio Grande do Norte	12	10	6	7	4	6	5	2	3	3	58
Rio Grande do Sul	22	21	30	20	15	16	17	30	24	25	220
Rondônia	25	19	27	12	12	15	17	12	19	13	171
Roraima	1	-	3	1	1	3	-	2	-	-	11
Santa Catarina	6	5	3	16	9	7	7	20	7	8	88
São Paulo	250	238	232	182	182	135	105	166	149	159	1798

Table 2. Deaths from essential hypertension according to year of care and federation unit in Brazil between 2014 and 2023. (N=8518) (conclusion)

Region/Federation Unit	Years										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Sergipe	13	43	33	23	12	8	5	15	11	6	169
Tocantins	10	6	7	1	8	18	14	15	10	13	102
Total	1126	1106	991	948	852	810	635	748	663	639	8518

Source: Unified Health System Informatics Department (DATASUS).

Table 3 shows the absolute data and percentages of hospitalizations, days of stay and mean hospitalization, deaths and mortality rate due to essential hypertension according to gender, age group, race/color, character and system of care in Brazil between 2014 and 2023. Females (58.5%), those aged between 60 and 69 (22.8%), those of brown race/color (214683; 42.0%), emergency care (479401; 93.8%) and public care (14.0%) had a higher frequency of hospitalizations. It is important to note that there was a high frequency of records in which the care regime was classified as "ignored", totaling 75.1%.

In relation to days and mean length of stay, there was a predominance of females with 1,225,721 days and a mean length of stay of four days, in the 70-79 age group with 492,783 days and a mean length of stay of 4.5 days. Individuals of brown race/color stayed the longest (80,969 days), but black race/color had the longest mean stay (9.2 days). Emergency admissions resulted in more days in hospital, 809069 days, and elective admissions resulted in a higher mean number of days (6.6). Private care accounted for 246867 days of hospitalization, with a mean of 4.4 days (Table 3).

The frequency of deaths was higher among females (53.5%), those aged 80 and over (34.0%), brown people (41.6%), those receiving emergency care (94.1%) and those receiving public care (13.4%). In relation to the mortality rate, there was a predominance of males (1.9%), people aged 80 and over (4.1%), black people (1.9%), emergency care (1.9%) and public classified care (1.6%). Noteworthy is the rate considered "ignored" (1.7%) (Table 3).

Table 3. Hospitalizations, days and mean hospitalization, mortality and mortality rate for essential hypertension according to gender, age group, race/color, character and care regime in Brazil from 2014 to 2023. (N=599351) (continued)

Variables	Hospitalizations N = 511295 n (%)	Days / mean length of stay	Deaths N = 8518 n (%)	Mortality rate %
Gender				
Male	212443 (41.5%)	825071 (3.8)	3958 (46.5%)	1.9
Female	298852 (58.5%)	1225721 (4.0)	4560 (53.5%)	1.6
Age group				
20-29 years old	18531 (3.6%)	57029 (3.1)	51 (1.9%)	0.3
30-39 years old	36924 (7.2%)	117305 (3.2)	160 (1.9%)	0.4
40-49 years old	65347 (12.8%)	204202 (3.1)	459 (5.4%)	0.7
50-59 years old	96411 (18.9%)	324286 (3.3)	987 (11.6%)	1.1
60-69 years old	116542 (22.8%)	481085 (4.0)	1703 (20.0%)	1.5
70-79 years old	106303(20,8%)	492783 (4.5)	2259 (26.5%)	2.2
80+	71237(13,9%)	374102 (5.1)	2899 (34.0%)	4.1
Race/Skin color				
White	126939 (24.8%)	510296 (3.9)	1828 (21.5%)	1.5
Black	26298 (5.1%)	255222 (9.2)	510 (6.0%)	1.9
Brown	214683 (42.0%)	809069 (3.7)	3547 (41.6%)	1.7

Table 3. Hospitalizations, days and mean hospitalization, mortality and mortality rate for essential hypertension according to gender, age group, race/color, character and care regime in Brazil from 2014 to 2023. (N=599351) (conclusion)

Variables	Hospitalizations N = 511295 n (%)	Days / mean length of stay	Deaths N = 8518 n (%)	Mortality rate %
Asian	14889 (1.9%)	42506 (3.0)	116 (1.4%)	0.8
Indigenous	748 (0.1%)	2449 (3.3)	13(0,2%)	1.6
No information	127738 (25.0%)	431250 (3.4)	2504 (29.4%)	2.1
Service nature				
Elective	3184 (6.2%)	229933 (6.8)	500 (5.9%)	1.7
Urgency	479401 (93.8%)	1820859 (3.7)	8018 (94.1%)	1.9
Care regime				
Public	71757 (14.0%)	242422 (3.4)	1141 (13.4%)	1.6
Private	55415 (10.8%)	246867 (4.4)	816 (9.6%)	1.5
Unknown	384123 (75.1%)	1561503 (3.7)	6561 (77.0%)	1.7

Source: Unified Health System Informatics Department (DATASUS).

Discussion

The study made it possible to know the occurrence of hospitalization and mortality due to AH in Brazil between 2014 and 2023, as well as the profile of hospitalizations and deaths and the length of stay in hospital units due to the condition. In relation to the number of hospitalizations, although there has been a reduction, the data showed that the disease is still one of the main causes of hospitalization, not least because there is an established association between AH and other comorbidities that worsen the clinical condition of individuals[3,6-8]. One of the reasons for the reduction in the number of hospitalizations may be the strengthening of basic health care in the country, especially with the expansion of the family health strategy (FHS), and public policies aimed at the population with AH, which leads to a reduction in the worsening of the disease and the need for hospitalizations[10-11].

The results of a study on the epidemiological profile and hospital morbidity and mortality of hospitalizations due to essential hypertension in Brazil in the period 2008-2017 in people aged 20 years and over, draws attention to the high incidence of hospitalizations due to AH, corresponding to 7.21% of hospitalizations due to diseases of the circulatory system[9]. The study's authors also found that AH was responsible for 1.4% of all deaths from circulatory system diseases, with a mean mortality rate of 1.5%.

AH can lead to complications that result in hospital admissions and, in more serious cases, death[6]. Despite the alarming figures, the condition is sometimes neglected, both by people affected by the disease and by health professionals, who underestimate it[12].

São Paulo stood out with the highest hospitalization numbers, which can be explained by the city's higher demographic density compared to other regions[13] and the greater number of hospital health services. Contrary to this finding, a study on the prevalence of hospitalizations and mortality due to AH, using data from DATASUS published in 2023, showed that the Northeast and Midwest regions had the highest hospitalization rates[10].

One study draws attention to the fact that the southeastern region, which includes São Paulo, has a high hospitalization rate due to its larger population and because it has a better system for collecting information on epidemiological data[9]. However, no information was found in the literature to justify the Maranhão state being right after São Paulo in terms of the highest hospitalization numbers in the period, and the Amapá state having the lowest number.

Variations in hospitalization rates in different regions are associated with each region's

socio-economic characteristics, such as the structure and organization of health services and human development indices[14]. It should also be noted that poor access to health services is an important vulnerability factor for morbidity and mortality, and is more prevalent in the North and Northeast regions.

In order to tackle the challenge of hospitalizations due to essential hypertension, it is crucial to implement strategies to raise awareness and educate people about the disease. In addition, it is necessary to promote adequate access to antihypertensive medications and improve adherence to treatment. Measures such as regular monitoring of blood pressure (BP), offering psychosocial support to patients and implementing measures to facilitate access to health services are also essential in this process[1,15]. An ecological study on the reduction in hospitalization rates associated with the number of consultations and BP control found that the reduction in the number of hospitalizations due to hypertension was related to the number of consultations offered and the control of blood pressure levels[8].

Early diagnosis and proper AH treatment are key to preventing complications and reducing the need for hospitalization. Lifestyle changes, such as a healthy diet, regular physical activity and adequate use of antihypertensive medications are still a challenge in Brazil[16].

This study showed that, in general, there was a reduction in the number of deaths in Brazil over the 10 years analyzed (2014 to 2023), but with fluctuations in some federal units (FU), which showed an increase in the number of deaths. However, data from the Mortality Information System (Sistema de Informação sobre Mortalidade, SIM) showed that in the last ten years there has been an increase in the mortality rate from AH in Brazil, more specifically since 2020, when it went from 12.6 deaths per 100,000 inhabitants to 18.7 deaths per 100,000 inhabitants in 2021[8]. Research shows that AH was considered responsible for more than 22% of deaths in Brazil in 2015, predominantly in the North and Northeast regions[17].

Data on deaths from hypertensive diseases in Brazil between 2015 and 2019 indicated a total of 4,795 deaths, with rates varying over the years[18]. According to the aforementioned study,the analysis of these deaths revealed a predominance in the Northeast region, affecting mainly indigenous and black males aged 80 or over. The authors also pointed out that these inequalities highlight the importance of public health approaches that consider the social determinants of health and promote equal access to preventive measures and appropriate treatments.

The São Paulo state once again stood out in terms of the highest absolute number of deaths, followed by Bahia. The literature shows that in addition to the fact that states in the Southeast have a higher population density, they also represent an important economic hub in the country and serve as a reference point for the Brazilian population, culminating in a higher death rate from essential hypertension in the country, such as São Paulo[10]. However, another study on AH mortality in Brazil between 2015 and 2019 with data from DATASUS, published in 2022, showed the highest mortality rate in the northeast region, including the state of Bahia. This was possibly due to the lack of effective therapeutic protocols and the difficulty in accessing health services in the region[18].

In this study, females had the highest number of hospitalizations and deaths. However, the mortality rate was higher among men. It is known that women sought health services more often, 2.4 times more often than men[19], which may explain the higher number of hospitalizations.

A study that assessed the profile of hospitalizations for decompensated systemic arterial hypertension in a health macro-region in the Maranhão state found that lethality was higher for men compared to women, despite a lower hospitalization rate among men compared to women[20]. However, no justification or comparative data has been found in the literature as to why the mean number of days spent in hospital was the same for both genders, as was observed in this study.

In relation to age group, the results show that the majority of hospitalizations for hypertension involved people aged 60 or over, in line with the fact that essential hypertension mainly affects the

adult population, especially those aged over 60[21]. In contrast, in a 2021 study on hospitalizations for AH in the state of Goiás, the results pointed to a higher number of hospitalizations in the 50-59 age group[19].

In this study, the brown race/color was responsible for the largest number of hospitalizations and deaths, as in another study that looked at the profile of hospitalizations for diabetes mellitus and AH and showed that the majority of people hospitalized were self-declared browns[22]. The authors highlighted the high prevalence of up to 130% of hypertension in black women compared to white women, and mentioned genetic/hereditary conditions, reduced levels of access to primary care, socioeconomic conditions and racial prejudice as causal factors. This is similar to another ecological study with secondary data on factors associated with hospital admissions for hypertension, which, in relation to race/color, identified that non-white individuals are more prevalent in hospitalizations for essential hypertension[8] and that there is a greater occurrence among the black population, in a ratio of 3:1, with predisposing factors including socioeconomic factors, geography/ location, history of pathologies and lack of access to quality care.

In relation to indigenous people, although the numbers of hospitalizations and deaths found in this study have been reduced, the mortality rate among those hospitalized was the highest in relation to the white race/color. Corroborating a study that looked at AH mortality in Brazil between 2015 and 2019 with data from DATASUS and showed a higher mortality rate in the indigenous group, correlating the results to the habits and customs of the indigenous people that have changed over time[18].

Emergency care accounted for the largest number of hospitalizations. This scenario is probably due to people's poor access to primary care, lack of adherence to self-care and poor acceptance of therapy, whether it's medication or not. A descriptive study on the profile of hospitalizations for diabetes and AH also found that there is a high number of emergency admissions[22]. During hospitalization, the mean length of stay and the mortality rate were higher among older people aged 80 or over, which may be due to more vulnerable health conditions, the presence of comorbidities or the possibility of complications due to the aging process.

People diagnosed with AH face a higher mortality risk due to ischemic and hypertensive heart disease. These results emphasize the importance of hypertension as a risk factor for cardiovascular diseases and highlight the worrying trend of an increase in the number of deaths related to hypertensive diseases in recent decades, both in Brazil and in the United States[8]. Identifying the most vulnerable groups can provide valuable information for developing targeted and effective strategies to prevent and control AH.

Research into risk factors, socio-economic impacts and regional differences could also help to combat the disease more effectively. Therefore, strategies to strengthen preventive measures in primary care, such as promoting healthy lifestyle habits and increasing access to diagnosis and treatment, are recommended to further reduce the numbers of hospitalizations and mortality from essential hypertension in the country. The engagement of health professionals, public managers and society in general is fundamental to meeting this challenge and guaranteeing a better quality of life for the population.

The scarcity of data in the information system ends up providing bases and references that do not portray the figures in their entirety. It is important to emphasize the importance of the completeness of notifications and data in the information system, in order to foster the production of statistical information on mortality and the construction of the main health indicators for the Brazilian population. A computerized system will enable greater communication in the health network, contributing to care centered on the individual and not just on the disease, and will thus help to resolve the health-disease process[8].

It should also be noted that there is a shortage of information on hospitalizations related to skin

color and this gap can hinder planning and the allocation of resources to the most vulnerable populations. It is well known that the quality and completeness of data in information systems is a necessary condition for a reliable understanding of the inequalities involved in mortality.

Based on this information, there is a need to implement public health policies to clarify the early diagnosis and appropriate treatment of AH. In this sense, prevention and health promotion programs, especially in the primary care sector, play a fundamental role in reducing the incidence and economic impact of AH in Brazil.

In view of this data, it is essential to expand actions to prevent and control essential hypertension in order to reduce morbidity and mortality. Strategies such as promoting healthy lifestyle habits, raising awareness about the importance of regular blood pressure monitoring, adequate access to antihypertensive medications and health education programs can play a crucial role in reducing the complications and mortality associated with essential hypertension[1].

When interpreting the results of this study, it is important to consider some limitations. Firstly, the source of information used is a secondary database, which implies the possibility of underreporting in the DATASUS system. Secondly, the lack of additional data or even variables presented as "ignored" prevent a more in-depth analysis of the results. However, it is worth noting that the public availability of access to data is a positive aspect, as it is valid and contributes to generating aggregate knowledge, as well as helping to formulate public health policies. It is also worth mentioning that secondary databases are essential for tracking diseases and making effective decisions.

Conclusion

This study provides a comprehensive overview of the number of hospitalizations and deaths related to essential hypertension in Brazil between 2014 and 2024. There has -been a reduction in hospitalizations and deaths from the disease over the years, although with regional differences. The states of São Paulo and Maranhão had the highest number of hospitalizations due to AH, whereas the states of São Paulo and Bahia had the highest number of deaths.

The results emphasize the importance of preventive measures, early diagnosis and control of hypertension in order to reduce the impact of hospitalization and the complications associated with this disease. There is also a need for further research to improve understanding of the characteristics of hospitalization and mortality due to essential hypertension, in order to obtain more complete and up-to-date information for making health decisions.

Collaborations:

1 – conception and planning of the project: Catia Suely Palmeira e Yasmin Maria Mello Lima

2 – analysis and interpretation of data: Catia Suely Palmeira e Yasmin Maria Mello Lima

3 – writing and/or critical review: Catia Suely Palmeira, Yasmin Maria Mello Lima, Tassia Teles Santana de Macedo e Simone Cardoso Passos

4 – approval of the final version: Catia Suely Palmeira, Yasmin Maria Mello Lima, Tassia Teles Santana de Macedo and Simone Cardoso Passos

Conflicts of interests

There are no conflicts of interest.

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