

Hospitalizations and Hospital Cost from Cardiovascular Diseases in Brazil

ORIGINAL

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Abstract

This study aimed to estimate the number and average cost of hospitalizations from cardiovascular diseases in Brazil. Descriptive, retrospective study with a quantitative approach, on the number and hospitalization cost from cardiovascular diseases (acute myocardial infarction, hypertension and heart failure) in Brazil. The research was conducted by using secondary data, available online at the Department of Health System Information, from 2008 to September 2015. Cardiovascular diseases were responsible for significant numbers of hospitalizations especially for heart failure representing higher admissions. As for costs, there was stability in the amount paid for the cases of hospitalizations by hypertension and increasing costs in Heart Failure and Acute Myocardial Infarction. Cardiovascular diseases continue to relate to the large increase in hospitalization rates from the analysis of the expenses of the Unified Health System with the Public Health.

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Keywords

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Introduction

Increased life expectancy and the consequent population aging are world-wide phenomena that today have contributed significantly to a higher occurrence of chronic diseases [1]. In this context, the national and international public authorities needed to elaborate an agenda of priorities due to the socioeconomic impact reflected in mortality statistics [2].

In this scenario, the report by the World Health Organization in 2012 is highlighted, dealing with mortality from CVDs. In this document, there is a comparison of 2008 data with 17 million deaths related to cardiovascular events, and in 2030, there was an increase in 25 million deaths [3]. In line with such indices, cardiovascular diseases in Brazil are the leading causes of deaths in the population, affecting mainly the most vulnerable segment of society, with lower income and education [4]. Among the CVDs, the most prevalent are acute myocardial infarction, angina, heart failure, hypertension, valvular heart diseases and others.

Thus, given the significant impact caused by CVDs in public health, a worrying fact is that nowadays, the society has been affected by these conditions in age groups at an earlier age. What once was characterized as an elderly disease, nowadays, young adults are also being targeted by these heart disease [5], for the acquisition of habits and behavior patterns that corroborate the existence of risk factors associated with CVDs in modern life [6].

The individuals affected by CVDs are more likely to hospitalizations since they require frequent interventions justified by the existence of higher risk in functional impairment, the presence of comorbidities and the appearance of complications, needing clinical treatment and invasive procedures that make costly therapy [5].

Thus, when analyzing the expenses of the Unified Health System (SUS) with the Public Health, an annual increase is observed, especially concerning cardiovascular diseases [7]. This information related to the costs of hospitalizations are usually obtained by DATASUS, a database where there is a high quantity of hospitalizations for CVDs, exceeding the average for other types of diseases and thus alerting SUS managers to develop health indicators to enable adoption of measures to reduce them [8, 9].

Thus, the quantitative analysis of hospitalizations and costs of CVDs becomes essential to the extent

that health indicators are reflections of the adopted goals and at the same time are signals and subsidize makers of policies and managers to change and decision-making to reduce the morbidity and mortality rates with rationalization costs without adversely affecting the patient's need.

Thus, the following guiding question was created: What is the estimated number and average cost of hospitalization for CVDs in Brazil?

Therefore, this study aimed to estimate the number and average cost of hospitalization for CVDs in Brazil.

Methods

This is a descriptive, retrospective study with a quantitative approach on the number and hospitalization costs for CVDs in Brazil. The research was conducted by using secondary data, available online and free of charge by DATASUS, a department that provides epidemiological information, morbidity, health care, financial resources, among others.

It was access to health information via TABNET, a public tabulator domain that generates information of the Unified Health System databases (SUS), available at the DATASUS website.

Data collection held in December 2015 was completed by two researchers, who followed the following steps simultaneously: access to DATASUS web page, choose the alternative 'Health Information (TABNET)', 'Epidemiologic and Morbidity', 'Morbidity hospital SUS', 'general - the place of hospitalization from 2008', and geographically Brazil coverage by region and federation unit.

Thus, the collection used data from the hospital morbidity of SUS, by hospitalization place in Brazil. The following dependent variables were considered: admissions by type of disease [acute myocardial infarction (AMI), heart failure (HF) and systemic arterial hypertension (SAH)] and the average cost of hospitalizations authorized by type of disease (AIM, HF, SAH). The independent variables were:

gender, race, age, region, service character and time coverage (January 2008 to September 2015). It is highlighted that this period was selected due to the full availability of information on the DATASUS system. For population estimates, there was information obtained from the Brazilian Institute of Geography and Statistics (IBGE), collected through the DATASUS website.

Data tabulated by TABNET were transported to Microsoft Excel 2010 and analyzed using simple descriptive statistics. By being an available secondary data research of open access, the Research Ethics Committee submission of this study was exempt.

Results

CVDs (AMI, SAH, and HF) had 3,220,133 hospitalizations between 2008 and September 2015, with emphasis on the HF that alone accounted for 1,919,429 of the hospitalizations.

The number of hospitalizations for CVDs from January 2008 to September 2015 ranged from 63,338 to 95,343 in the case of AMI, from 46,664 to 101,414 in the case of SAH and from 149,236 to 270,988 in the case of HF.

There was a downward and constant trend for the number of cases of hospital admissions for hypertension and HF from January 2008 to September

2015. However, it was found a growing number of admissions for AMI by the year 2014 (**Figure 1**).

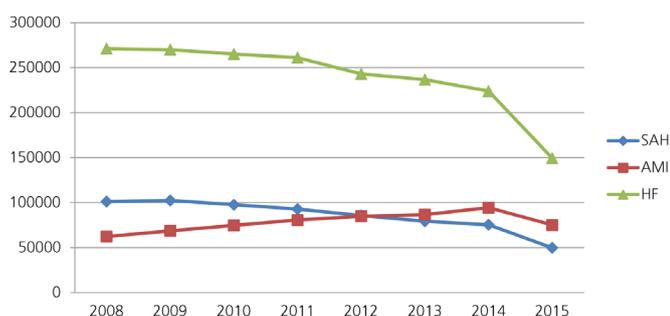
Regarding the cost of these hospitalizations, there was stability in the amount paid for the cases of hospitalizations for hypertension between 2008 and 2015, with AN average of R\$ 300.51 (min R\$ 274.07; Max R\$ 350.84). The costs of hospitalizations for heart failure and myocardial infarction presented are increasing and constant in this period, averaging R\$ 1,223.05 and R\$ 3,085.15, respectively. **Figure 2** shows the costs of hospitalizations for CVDs from January 2008 to September 2015.

Among the DCVs studied, there was a greater quantity of hospital admissions of males (51.2%; 63.4%) and white (36.4%; 40.8%) for HF and AMI respectively; but female (59.2%) and brown (34.0%) in SAH situations. These admissions occurred predominantly in an emergency and people aged over 50 years old (**Table 1**).

As shown in Table 01, a number of hospitalizations for HF and AMI are more than double between 50-59 years old (309.615; 164.497), compared to 40-49 years old (143.314; 76.852). This trend also occurs in hospitalizations for hypertension to the age group of 40-49 years old.

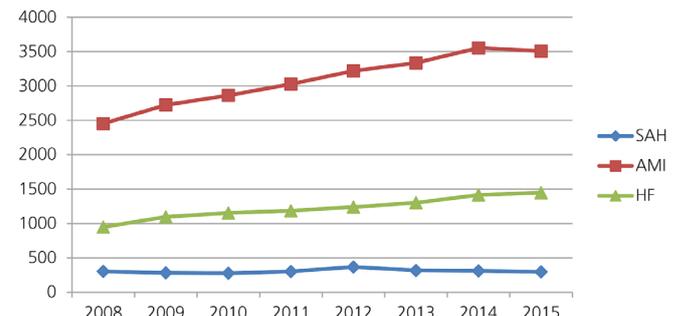
When analyzing regions, the highest number of hospital admissions for AMI and HF occurred in the Southeast (51.7%; 42.0%) and hypertension in the

Figure 1: Hospitalizations for cardiovascular diseases (AMI, HF, and SAH) between 2008 and September 2015. DATASUS, 2015.



Source: Ministry of Health, Hospital Information System of the Unified Health System (SIH-SUS) 9. SAH: systemic hypertension; HF: heart failure; AMI: Acute Myocardial Infarction.

Figure 2: Cost of hospitalizations for cardiovascular diseases from January 2008 to September 2015. DATASUS, 2015.



Source: Ministry of Health, the Hospital Information System of the Unified Health System (SIH-SUS). SAH: systemic hypertension; HF: heart failure; AMI: Acute Myocardial Infarction.

Table 1. Distribution of the domains and facets of QoL. João Pessoa, PB, 2015.

Variables	Number of Hospitalizations (2008-2015)					
	N	%	N	%	N	N
Gender						
Male	277.131	40.8	983.203	51.2	394.454	63.4
Female	401.343	59.2	936.226	48.8	227.776	36.6
Race						
Without information	238.642	35.2	605.137	31.5	210.861	33.9
White	176.244	26.0	698.328	36.4	253.673	40.8
Brown	231.019	34.0	519.967	27.1	136.093	21.9
Black	28.590	4.2	86.021	4.5	18.194	2.9
Yellow	2.798	0.4	7.474	0.4	2.982	0.4
Indigenous	1.181	0.2	2.502	0.2	427	0.1
Age group (years old)						
≥80	84.306	12.4	403.563	21.0	59.038	9.5
70-79	137.547	20.3	507.270	26.4	124.334	20.0
60-69	151.403	22.3	444.379	23.2	174.395	28.0
50-59	134.364	19.8	307.001	16.0	163.227	26.2
40-49	92.071	13.6	141.985	7.5	76.251	12.3
30-39	45.480	6.7	56.775	2.9	18.854	3.0
20-29	22.564	3.3	24.891	1.3	4.502	0.7
<1-19	10.739	1.6	33.565	1.7	1.629	0.3
Region						
			1			
Southeast	234.007	34.5	805.873	42.0	321.160	51.7
Northeast	241.861	35.6	459.469	23.9	117.070	18.8
South	63.357	9.4	409.421	21.3	125.268	20.1
Midwest	65.228	9.6	143.304	7.5	35.208	5.6
North	74.021	10.9	101.362	5.3	23.524	3.8
Service						
Emergency	629.473	92.8	1.815.254	94.6	568.674	91.4
Elective	48.935	7.2	103.654	5.4	53.484	8.6
Others	66	0.0	521	0.0	72	0.0

Source: Ministry of Health, the Hospital Information System of the Unified Health System (SIH-SUS). SAH: systemic hypertension; HF: heart failure; AMI: Acute Myocardial Infarction

Northeast (35.6%). By considering proportionally, the quantitative population estimated by IBGE in 2010, it appears that the greatest number of hospitalizations for hypertension and AMI per number of inhabitants occurs in the North and HF in the South.

Regarding hospitalization in the adult age group (20-59 years old) and elderly (>60 years old), it is observed that most adults are hospitalized for hypertension (43.4%) while the elderly admissions were most by HF (70.6%).

Discussion

This study revealed that hospitalizations for CVDs are quite significant within the panorama of Brazilian public health, especially for HF reflecting high rates of hospitalization, despite the slight decrease observed in the research results.

A survey conducted in São Paulo involving CVDs shows the need for investment to deal with these health conditions and warn that even with decreased numbers in Brazil, it is characterized as an alarming statistic [10].

A study in the Federal District on the sensitive causes to the hospitalization process confirms this study, identifying HF as the second cause of hospitalization, corresponding to 12% of all causes raised. Other findings similar to this research were the prevalence of hospitalizations for HF affecting males aged over 60 years old since the aging process is a determining factor for the development of chronic diseases and their complications [11].

DATASUS show that HF represents the leading cause of hospitalization among the CVDs in the country when compared with other hypertensive diseases (244.788); another ischemic heart disease (1.160.604); conduction disorders and cardiac arrhythmias (430.023) and other heart diseases (279.442). Thus, it is assumed that this happens due to the etiology of HF be multiple and caused by any condition that determines the reduction of the blood pumping through the heart [12].

Similar circumstance as the trend of reduction in hospitalization caused by hypertension was observed in the study consistently to other research. In a study on the amount of hospitalizations investigated by the hospital information system and basic care information system, there was a decrease in the rates of hospitalization for hypertension estimated at 60% of all hospital admissions, especially in the elderly population [13].

According to some researchers, this decrease has been attributed to increased coverage of health strategies of the family developing their work preventively in injuries and the consequences of hypertension, reality found of the State of Rio de Janeiro [13].

Opposite to the data discussed here so far, there was a significant increase in admissions for AMI. This reality is shown in a survey conducted in the city of Belo Horizonte that indicated the magnitude of the number of people with this diagnosis and bringing an increase evidence from 2011, which is consistent with this research. It is noticed that over the years, the numbers only grow and in 2014 there was a higher proportion of people who required hospitalization for this ischemic disease [14].

In this scenario, although CVDs have suffered a drop in mortality worldwide [15], hospitalization rates remain at alarming as shown in the numbers presented in this study, being responsible for onerous costs for the treatment chain, specifically in the therapeutic process of HF and the AMI.

It is inferred that this is a reflection of interventional procedures that involve greater cost for treating these diseases, the possibility of the examination of coronary angiography, coronary angioplasty and cardiac surgery in patients affected with AMI and HF which involve complex technological features and high cost, and specialized human resources that need to qualify continually [16]. Different with this fact, the costs of treatment of patients with hypertension remained stable during the study period, suggesting that this event is related to the therapeutic

profile of the disease, predominantly clinical. In this context, there is the relationship between CVDs and costs produced by them [17].

In this sense, there is a progressive reduction in mortality by CVDs. However, despite this reduction, there are even higher rates of morbidity and hospital admissions for these diseases. It is worth noting that the spatial distribution by CVDs in Brazil undergoes changes when analyzing the various regions that make up the country, justified by the different degree of exposure to risk factors such as environmental, process of urbanization, socioeconomic conditions of the population and lifestyle since it is scientifically proven that the presence of modifiable risk factors (smoking, sedentary lifestyle, poor eating habits, hypertension, diabetes) and non-modifiable (sex, gender, age, genetic predisposition) predispose individuals to develop CVDs [4].

In this line of thought, it is understood the importance of reducing statistics related to CVDs from the control of risk factors to minimize the consequences and damage of the disease in the individual's daily life. To achieve this end, measures are being incorporated into the routines of health institutions, exemplified in monitoring activities of patients, educational, encouraging the maintenance of a healthy life, food control and the incorporation of physical exercise in the patient's routine [18].

With the socioeconomic impact that CVDs has been causing both globally and in our country, there was the need to develop action plans to control and prevent severities for DCNT, which fall under the CVDs as the plans made by Pan American Health Organization (PAHO) and the Ministry of Health which aim to prioritize actions and investments, setting goals and commitments to be undertaken, highlighting the need for investments to reduce the significant data and costs shown in the literature and in this study [19].

Statistics already show trends in the world and our country as the quantitative growth of CVDs. Its

instances are already too sufficient for the establishment of a strategic policy to address them. It is not just a clinical occurrence, and as such, it demands a government sectoral response. A systemic and global vision to overcome them is necessary [20].

To achieve this strategic and coordinated government policy is required in advance, that the State relativize the monetarist design - present in most government conveyances - that public health should be drawn from only their costs [20]. Overcoming this view means ensuring public investment as a state policy and consolidate it as an ironclad policy, planned and crosscutting. Its application will strengthen the essential preventative design. In this context, the contemporary "outbreak" of CVDs can be minimized.

Conclusion

CVDs continue to relate to the large increase in hospitalization rates from the analysis of the expenses of the Unified Health System (SUS) to Public Health. An annual increase is observed, especially heart failure. In this sense, it is alerted to the need to intensify the control of risk factors of CVDs to minimize the costs that they cause, especially concerning primary prevention, strengthening guided initiatives in more simple and effective procedures that will reduce hospitalizations.

In this study, it was possible to identify the wealth of important information and statistics for the health scenario which is grouped in DATASUS portal. It is also worth noting that even with the ease of access to the theme chosen, there are limitations in some aspects, because the SIH/SUS system does not indicate the occurrence of readmissions, being an important data for the quantitative of admissions found.

Therefore, it is reinforced the need to understand the CVDs not just as costly to the health system, but as a mirror to adjust service priorities and treatment of patients with myocardial infarction, heart failu-

re, and high blood pressure, and thus allowing a greater and better access to health services by the population.

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