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The Epidemiology of Heart Disease in Brazil Between 2021 and 2022

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ABSTRACT

Introduction: Cardiovascular disease (CVD) is the leading cause of death in Brazil. CVDs are multifactorial pathologies, defined by the combination of genetic, environmental and behavioral factors, and are characterized as one of the main causes of death in Brazil and worldwide.

Objectives: To discuss through a literature review the causes and consequences of the main heart diseases and to present the epidemiological results in Brazil of data collected through the DATASUS System between the years 2021 and 2022. The data observed shows the frequency of the six main causes of death from CVD in the Brazilian population.

Results: Between 2021 and 2022, IHD and CVD were responsible, respectively, for 32% / 23% of deaths from CVD in the general population in 2021 and 37% / 14% in 2022, being pointed out as the main causes, with the highest prevalence among the male public and the age group between 60 and 79 years, when analyzed by regions and federative units of Brazil, the highest rates were found in the Southeast region, followed by the Northeast region. When analyzing deaths in terms of place of occurrence, it was observed that the majority occurred in the hospital environment, followed by the home environment.

Final considerations: CVD is still the leading cause of death in Brazil. Thus, primary prevention of CVD should be a priority, intensifying control of the main risk factors for CVD, which would also affect incidence and improve early diagnosis.

KEYWORDS: Cardiovascular diseases; Heart disease epidemiology; Heart disease mortality.

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INTRODUCTION

Cardiovascular diseases are the leading cause of death in Brazil. Cardiovascular diseases are groups of conditions that affect the heart and its blood vessels (TSAO et.al, 2023).

For Da Silva (2020), the corresponding risk factors are: smoking, obesity, sedentary lifestyle, alcohol, hypertension, diabetes and hyperlipidemia.

The main symptoms are chest pain, edema, limb pain, palpitation and syncope (DA SILVA, 2020).

The Brazilian Society of Cardiology (SBC) estimates that almost 400,000 Brazilian citizens die every year from heart and circulation diseases. The most common pathologies in Brazil are acute myocardial infarction and heart failure (SBC, 2022).

According to the World Health Organization's (WHO) 2030 Agenda for Sustainable Development, member countries are committed to a 30% reduction in premature mortality from non-communicable diseases, particularly cardiovascular disease (CVD) (ischemic heart disease and

stroke), cancer, respiratory disease and diabetes (WHO, 2023).

According to Groenewegen et.al (2020), these conditions are responsible for approximately 41 million deaths per year, equivalent to 71% of deaths worldwide.

According to Chehuen et.al (2019), strategies to tackle these diseases must have information from reliable, transparent and reproducible systems.

The analysis of mortality trends is crucial for the effective development of health, social security and investment policies, among others (TUFIK et.al, 2017).

The Mortality Information System (SIM) was created in 1975 by the Brazilian Ministry of Health and is responsible for collecting, storing, managing and disseminating national mortality data (BRASIL, MINISTÉRIO DA SAÚDE, 2022).

This health information system represented a major advance in the country's epidemiological surveillance, as its main task is to record all deaths in Brazil. The Ministry of Health implemented a standard death certificate model for collecting information on death, which uses the ICD to code the causes of death. In addition, a flow for collecting, processing and distributing death information has been implemented in all of the country's 5,570 municipalities (BRASIL, MINISTÉRIO DA SAÚDE, 2022).

According to the Brazilian Ministry of Health (2022), the quality of statistics on causes of death in Brazil, which was low in the early 2000s, especially in some parts of the country, has improved significantly over the last two decades.

Knowing the heterogeneity of these indicators in Brazil, the Cardiovascular Statistics - Brazil report treats the data to have an estimate closer to the real thing, correcting for underreporting and redistributing ill-defined causes of death (SIQUEIRA 2017; SANTOS et.al, 2014).

In order to collect data on this, the Brazilian Ministry of Health has the Hospital Information System (SIH) whose database aims to record all hospitalizations financed by the SUS (BRASIL, MINISTÉRIO DA SAÚDE, 2022).

SIH-SUS stores data on hospitalizations at the municipal level through the Hospital Admission Authorization, which contains information on the diseases that led to hospitalization (using ICD-10), length of stay, procedures and costs. Information from the SIH-SUS enables the development of methodologies and the definition of indicators to identify geographical disparities related to hospital resources (SIQUEIRA 2017; SANTOS et.al, 2014).

When citing statistics for cardiovascular risk factors, preference was given to the National Health Plan (PNS), which is a household-based epidemiological survey representative of Brazil, its large regions and UFs, metropolitan regions, capitals and other municipalities in each UF (BRASIL, MINISTÉRIO DA SAÚDE, 2022).

OBJECTIVES

To discuss through a literature review the causes and consequences of the main heart diseases, and to present the epidemiological results in Brazil of data collected through the DATASUS System between the years 2021 and 2022.

MATERIAL AND METHODS

To identify relevant studies, a search was carried out on the PubMed, Web of Science, Embase and Scopus platforms, using the following search algorithm: DATASUS/ Cardiovascular Diseases in Brazil between 2021 and 2022.

A search strategy was developed based on the evaluation of an objective on the subject in question, which forms the basis of the study: To identify the epidemiology of heart disease.

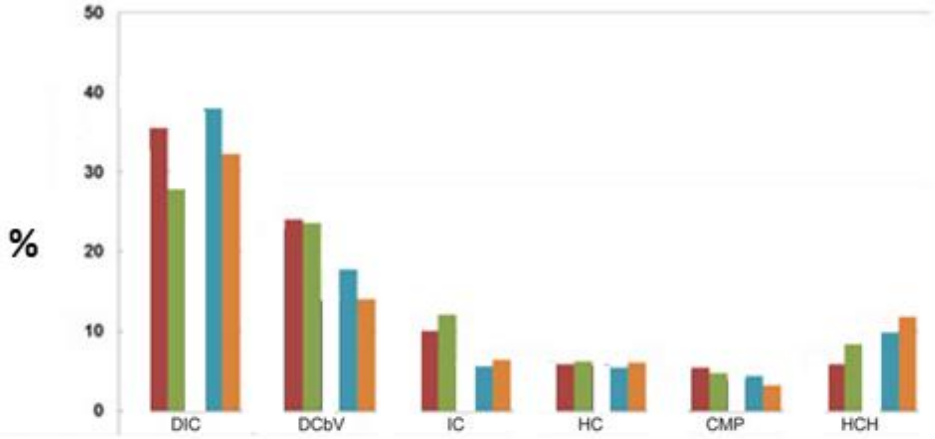
The search descriptors were selected from the Descriptors in Health Sciences (DeCS) website and then combined with the Boolean operator "AND". The databases used for the search were: PubMed and the Virtual Health Library (VHL), where cross-sectional, cohort and case-control studies were evaluated, in Portuguese and English.

RESULTS

According to the profile drawn up in this study, it can be seen that the highest prevalence was among males in all the years evaluated, when compared to females. This finding can be confirmed by other studies, which show that CAD is one of the main causes of hospitalization and mortality among males. In men, the figures show IHD and CVD at 36% and 24% in 2021 and 41% and 18% in 2022 respectively. In women, the rate was 28% and 24% in 2021 and 32% and 14% in 2022 (MINISTÉRIO DA SAÚDE, DATASUS 2021, 2022).

Graph 1 shows the frequency of the six main causes of death from cardiovascular diseases in the Brazilian population, according to data from DATASUS between 2021 and 2022. The graph describes six diseases; CVD: cerebrovascular diseases; CHD: cerebral hemorrhage; CMP: cardiomyopathy; HF: heart failure; HC: hypertension and hypertensive heart disease; IHD: ischemic heart disease.

Graph 1. Incidence of cardiovascular diseases in Brazil between 2021 and 2022.



		DIC	DCbV	IC	HC	CMP	HCH
2021	Men	36	24	10	6	5	6
	Woman	28	24	12	6	5	8
2022	Men	41	18	6	5	4	10
	Woman	32	14	6	6	3	12

Source: Ministry of Health. Unified Health System. DATASUS (2022).

The main causes of death from CVD in the general population are shown in Graph 1.

Between the years 2021 and 2022, IHD and CVD were responsible, respectively, for 32% / 23% of CVD deaths in the general population in 2021 and 37% / 14% in 2022, being identified as the main causes (MINISTÉRIO DA SAÚDE, DATASUS 2021, 2022).

According to this survey, the main causes of heart disease in Brazil between 2021 and 2022 are listed as follows;

Heart failure

This disease affects older people in particular, but it can also affect younger people. Currently, heart failure affects around 23 million people worldwide (FRIIS, H.; SELLERS, 2020).

The biggest barrier is the heart's inability to pump blood properly throughout the body, whether due to the inability of the heart muscle to contract and relax or other factors (SANTOS et.al, 2014).

Hypertension

The cardiovascular disease hypertension, commonly known as high blood pressure, affects around 25% of Brazilians and is linked to the genesis of other heart problems. It is a silent disease, because most of the time it does not manifest itself with specific symptoms (CHEHUEN et.al, 2019).

In general, hypertension is characterized by high levels of blood pressure in the arteries when the maximum and minimum pressure values are equal to or greater than 140/90 mmHg. (14 by 9) (FRIIS, H.; SELLERS, 2020).

According to data from the Brazilian Ministry of Health, there has been a significant increase in deaths from hypertension in the last two years (FIGURE 1).

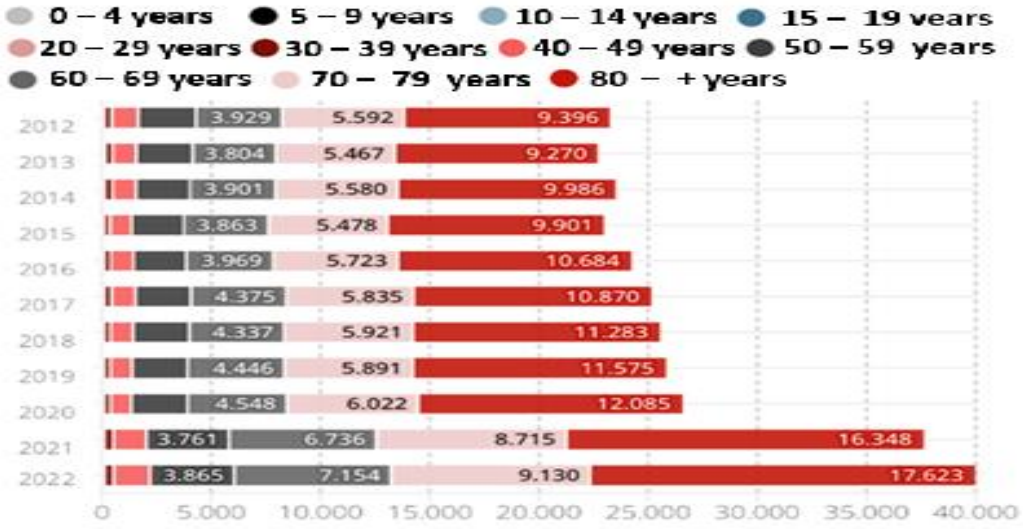


Figure 1. Number of deaths caused by hypertension in Brazil between 2012 and 2022. Source: Ministry of Health. Unified Health System. DATASUS (2022).

Individuals older than 80 years old presented the highest proportion of absolute in-hospital HF deaths in Brazil, from 2012 to 2022, (37% and 32%, respectively) (FIGURE 2).

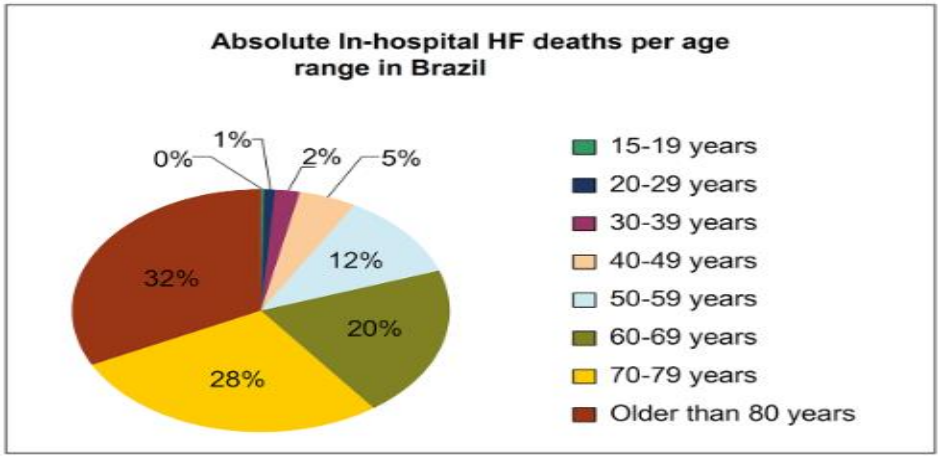


Figure 2. Hospital deaths (absolute number) from heart failure by age group in Brazil from 2012 to 2022. Source: Ministry of Health. Unified Health System. DATASUS (2022).

CORONARY ARTERY DISEASE

A condition known as coronary artery disease, or CAD, results from the obstruction of the coronary arteries by small fatty deposits that accumulate within it over time (the process of atherosclerosis) (CHEHUEN et.al, 2019).

This obstruction can result in more severe irrigation of the heart muscle (myocardial ischemia), which manifests itself as angina, arterial narrowing that compromises the irrigation of the heart muscle. Myocardial infarction, one of the biggest causes of mortality in the country, is a direct consequence of worsening CAD (SIQUEIRA 2017; SANTOS et.al, 2014).

CEREBROVASCULAR DISEASE

Known as a stroke, this condition is characterized by the emergence of a severe neurological deficit caused by an incident in the blood vessels of the central nervous system. Stroke comes in two varieties: ischemic and hemorrhagic (CHEHUEN et.al, 2019).

The most common is ischemic, which results from a blockage or abrupt reduction in blood flow in an artery in the brain, which causes a vascular territory with inadequate circulation (FRIIS, H.; SELLERS, 2020).

Hemorrhagic strokes, on the other hand, occur due to spontaneous rupture, which can cause intracerebral, intraventricular or subarachnoid hemorrhages (TUFIK et.al, 2017).

PERIPHERAL ARTERIAL DISEASE

Peripheral arterial disease (PAD) is characterized by the presence of fatty deposits in the aorta and its main branches, as well as compromising the more peripheral blood vessels located in the lower and, less frequently, the upper part of the body (CHEHUEN et.al, 2019).

The formation of a blood clot can aggravate arterial narrowing and increase the risk of complete obstruction of the affected artery (FRIIS, H.; SELLERS, 2020).

Rheumatic heart disease

Rheumatic heart disease (RHD) is a set of chronic or acute heart diseases that tend to develop as a result of rheumatic fever (FRIIS, H.; SELLERS, 2020).

The bacterial infection Streptococcus pyogenes causes an inflammatory disease known as rheumatic fever which, in certain situations, results in an overreaction of the immune system that affects the heart and other organs (CHEHUEN et.al, 2019).

CONGENITAL HEART DISEASE

Congenital heart disease is described as an abnormality in the structure or function of the heart that manifests itself during the first eight weeks of pregnancy, when the baby's heart is developing. It arises due to an alteration in the development of the heart, despite being discovered at birth or years later (TUFIK et.al, 2017).

DISCUSSION

When analyzed by regions and federative units of Brazil, it was observed that the highest rates were found in the Southeast region, specifically in the states of São Paulo and Rio de Janeiro with the highest rates, followed by the Northeast region (MINISTÉRIO DA SAÚDE, DATASUS 2021, 2022).

These facts are possibly related to the processes of urbanization and early development that regions such as the states of São Paulo and Rio de Janeiro have undergone, in addition to demographic changes, with an increase in life expectancy, phenomena that have implied an increased risk of being affected by and dying from chronic diseases,

including CAD (MINISTÉRIO DA SAÚDE, DATASUS 2021, 2022).

According to Marinho et al (2016), aging is associated with a high prevalence of death from chronic degenerative diseases, an event mainly related to the natural aging process of arterial vessels known as atherosclerosis, and exposure to modifiable risk factors such as smoking, poor diet, physical inactivity and alcohol use.

According to this study, in relation to age group, mortality from CAD in Brazil was most prevalent between 60 and 79 years of age, in line with the study by Oliveira et al. which showed CAD to be one of the main causes of mortality among the long-lived elderly (MINISTÉRIO DA SAÚDE, DATASUS 2021, 2022).

In addition, in relation to mortality from CAD according to the color/ethnic origin variable, the highest death rate was identified in white individuals.

According to Malta et al (2020), the color/ethnic origin variable is an imprecise parameter for assessing risks of exposure to health problems, however, such information helps to identify discrimination, social inequalities, access to health services, and exposure to risk factors, enabling the creation of health policies that reduce inequalities in access to health.

It is important to note that this reality is a reflection of men's greater vulnerability to health problems, especially chronic diseases, due to low adherence to individual health care and a reduced search for health services when compared to women (BOZELLI et.al, 2006; BENETTI et.al 1997; STEVENS et.al 2018).

In this study, when analyzing deaths by place of occurrence, it was observed that the majority occurred in the hospital environment, followed by the home environment. These data suggest that the majority of individuals affected by CAD tend to seek a hospital environment late in life, and in advanced stages of the disease, when the complications generated imply intense frailty for the individual, increasing the likelihood of the need for palliative care, or of progressing to death (MINISTÉRIO DA SAÚDE, DATASUS 2021, 2022).

PREVENTION STRATEGIES

Zago et al (2004) described that prevention strategies involve acting on the modifiable and non-modifiable factors for CAD, which can be identified during the individual's anamnesis and physical examination. These guidelines and interventions should be designed according to the individual's life situation and context.

This highlights the need and importance for health professionals, such as nurses, to know the CAD Mortality Profile in Brazil, in order to act to prevent these diseases through health education, paying attention to guidance and prevention of risk factors related to cardiovascular diseases, in order to reduce the mortality rate from these diseases (PINTO JUNIOR et.al, 2015; VAN DER BOM et.al 2011; SMITH 1985).

Cardiovascular Diseases (CVD) are multifactorial pathologies, defined by the combination of genetic, environmental and behavioral factors, and are characterized as one of the main causes of death in Brazil and worldwide (MALTA et.al, 2020; IIDA et.al 2019; FRISS et.al 2020; GUS 1998).

According to Siqueira (2017), around 14 million people in Brazil have some form of cardiovascular disease and at least 400,000 deaths occur each year as a result of these illnesses, which corresponds to 30% of all deaths in the country.

There are a total of eleven risk factors for cardiovascular disease, according to the Cardiology Society of the State of São Paulo (SOCESP). These factors, divided into mutable and immutable, are conditions that increase the likelihood of someone having these problems (SOCESP, 2022).

Polanczyk et.al (2020) point out that it is important to remember that even immutable risk factors can be mitigated with tactics such as continuous cardiological monitoring. These are: Age; Family history; Ethnicity. This means that, by focusing on mutable factors, it is possible to prevent most heart problems, which are Excessive alcohol consumption; High cholesterol level; Diabetes; High blood pressure; Excessive stress; Smoking; Obesity; Sedentary lifestyle.

FINAL CONSIDERATIONS

The Brazilian population shows different trends in CVD mortality rates.

The quality of mortality data in Brazil has been exemplified. However, errors related to diagnosis and the accuracy of death certificates are still common, and many deaths are associated with unknown causes, in addition to errors in data entry being the main limitations.

The number of death certificates with diagnoses based on symptoms, signs, and abnormal clinical and laboratory findings, rather than on the ICD, is an indirect indicator of data quality limitations.

Studies to validate mortality data are not available in most of the country's states and cities.

CVD is still the leading cause of death in the country. Thus, primary prevention of CVD should be a priority, intensifying control of the main risk factors for CVD, which would also affect incidence, and improving early diagnosis.

LIMITATIONS

This is a retrospective observational study, and the absence of individual patient data prevented us from establishing relationships between variables. Since our data was derived from a national database, it is possible that underreporting or misreporting of data occurred. Also, since readmissions are not considered in the total number of hospitalizations for HF, the hospital mortality rate may have been underestimated

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