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VIEWPOINT

Disparities in Women's Cardiovascular Health in Brazil

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Cardiovascular diseases (CVD) are the leading cause of death in women worldwide, responsible for 30.4% of female deaths in 2021, according to the Global Burden Disease (GBD) study. In Brazil, between 1990 and 2020, CVD was the leading cause of death in the female population, represented mainly by ischemic heart disease (IHD) and stroke. In 2021, during the coronavirus pandemic period, COVID-19 was the major cause of death among Brazilian women, reaching 21.9% of total deaths, and the percentage of deaths attributed to IHD and CVD was 8.5% and 7.8%, respectively (Figure 1). Additionally, from 1990 to 2021, proportional mortality from CVD was higher in females compared to males, with a similar percentage of deaths from IHD between the sexes and a higher percentage of deaths from stroke in women.[1]

In 2021, the prevalence of CVD in Brazil was 6.9%, representing an estimated number of 16,934,612.95 (95% CI, 15,521,701.66-18,314,418.12) individuals, lower among women, 6.3% (6.0-6.9) compared to men, 7.6% (7.0-8.1) (Figure 1). Moreover, the prevalence of CVD increases with advancing age, regardless of sex. Women had a higher prevalence of CVD than men between 5 and 44 years old, however, after this age, the prevalence was higher in males, reaching a maximum difference in the 60-69 age group.[1,2]

Despite the high prevalence of CVD, women's deaths from these diseases have declined globally in the last 30 years, with a significant reduction in high-income countries.[1] Socioeconomic factors, such as income, education level, and ethnicity, can explain, at least partially, this pattern in mortality rates, as observed by Mensah et al.[3] In Brazil, from 1980 to 2021, the downward trend in CVD mortality was unequal among the federative units (FU),[1] greater in units with better social determinants of health,[4-6] highlighting the impact of sociodemographic disparities on women's cardiovascular health.

Considering high prevalence and mortality rates, early detection and management of cardiovascular risk factors (RF) remain a priority measure for improving women's health. Among traditional RF, those with the most significant impact on mortality in Brazilian women are hypertension, obesity, dyslipidemia, diabetes mellitus (DM), smoking, and a sedentary lifestyle.[7] Diabetic women have a 45% higher risk of developing IHD than men, and smoking and obesity increase this risk by 25% and 65%, respectively. Also, hypertension is associated with a greater incidence of acute myocardial infarction in women.[8,9] National Health Plan (PNS) 2020-2023 revealed that the prevalence of DM and obesity increased among brazilian women by 40% and 71%, respectively, from 2006 to 2018, while hypertension remained stable. These diseases remained more prevalent among women compared to men in this period.[10] Again, the relationship with socioeconomic factors emerges, and Malta et al. demonstrated that populations with low schooling levels and lack of private health insurance had a higher prevalence of various chronic non-communicable diseases, including hypertension and DM, and greater degrees of limitation due to these diseases.[11] Furthermore, the VIGITEL Brazil 2023 survey demonstrated an increase in obesity and a reduction in healthy diet and physical activity in women with a lower level of education, reinforcing the role of social inequalities in CVD in Brazil.[12]

Keywords

Disparities, Women, Cardiovascular Health, Brazil

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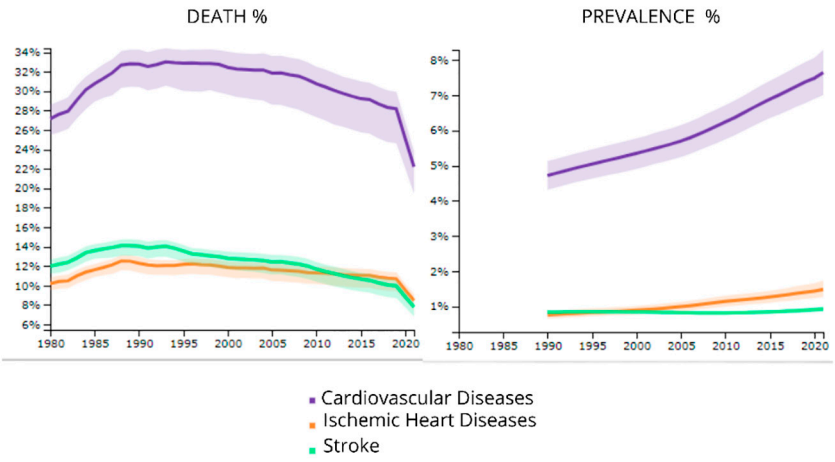

Figure 1 – Death and prevalence of Cardiovascular disease, Ischemic heart disease and stroke, in women, in Brazil.

In addition to traditional RF common to both sexes, growing evidence indicates that biological differences can affect the expression of cardiovascular RF and confer additional risk to women, determining the occurrence of CVD throughout life. Hypertensive disorders of pregnancy remain an essential cause of maternal-fetal complications, considered the second leading cause of mortality and disability in the reproductive phase of Brazilian women. Other sex-specific RF considered early indicators of cardiovascular risk are gestational diabetes, small-for-gestational-age newborns, and preterm delivery, according to Oliveira et al.[8]

An analysis from DATASUS shows that 32% of Brazilian maternal deaths were attributed to hypertensive diseases in 2022. Maternal mortality has shown a downward trend in recent years; however, during the pandemic period of COVID-19, it showed a significant increase, reaching 117 maternal deaths per 100.000 live births in 2021. This statistical data is very distant from the target of 70 deaths per 100.000 live births by 2030, established with the United Nations Sustainable Development Goals. Also, Maternal mortality was more significant in North and Northeast regions between 2012 and 2020, affecting black and Indigenous twice as much as white women, as well as affecting twice as many women with less than four years of schooling.[13] These findings may reflect inequalities in access to health services and reinforce the need for investment in maternal health services.

Besides traditional and sex-specific RF, there are RF considered underrecognized for CVD, such as psychosocial disorders and socioeconomic factors. In women, anxiety-depressive disorders increase the risk of IHD by two times and are identified as independent RF for worse cardiovascular outcomes.[14] Carpena et al., using data from the PNS 2013 and applying the Patient Health Questionnaire, demonstrated that Brazilian women had a higher prevalence of depressive episodes, suicidal ideation, and victimization due to violence. Furthermore, they discussed factors with a psychological impact, with emphasis on hormonal changes and social adversities, including mistreatment, violence, and gender roles.[15]

Socioeconomic disparity is another under-recognized RF that has been highlighted in the last decade. Analyzing the population, including both sexes, Bastos et al. evaluated the variation in the CVD mortality rate from 1990 to 2019 in the FU of Brazil and the association with two social determinants, the Social Vulnerability Index (SVI) and the Human Development Index (HDI). The FU of the North and Northeast regions, which had the smaller reduction in the mortality rate, presented the most social inequalities and minor development compared to the FU of the South and Southeast regions.[5] The relationship between the SVI and the mortality rate due to IHD and stroke in Brazil between 2000 and 2021 was evaluated by Bichara et al., and greater social vulnerability was observed in the FU that had a smaller reduction in

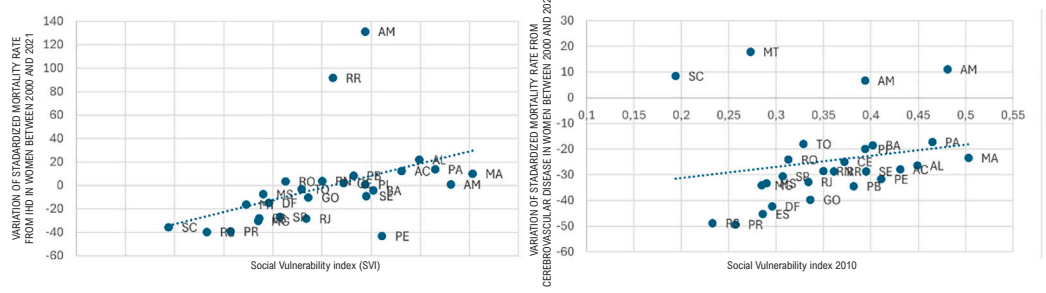

Figure 2 – Variation of standardized mortality rate from Ischemic Heart Diseases (A) and Cerebrovascular diseases in women between 2020 and 2021 (B) Social Vulnerability Index in 2010 in Federal Units in Brazil, in 2010.

the mortality rate, both in the total population and in females (Figure 2).[6,16]

Race diversity is another FR that is gaining notoriety. In the ELSA-Brazil study, a cohort that follows more than 15 thousand people in 6 Brazilian capitals, the frequency of hypertension, DM, and obesity was higher among black women compared to brown and white women between 2008-2010. Almost half of black women had hypertension (46.7%), compared to 33.8% of brown women and 26.1% of white women. After four years of follow-up, the number of new cases of hypertension and obesity was higher among black women, and controlling hypertension was more difficult in this population. This study pointed to racism as one cause of health inequality in Brazil. Among black participants, 32% reported lifetime experience of racial discrimination, such as unfair treatment at work, in housing matters, by the police, or in public places. Furthermore, undergoing these experiences was related to risk markers for CVD, such as worsening kidney function, greater arterial stiffness, atherosclerosis, and faster weight gain.[17]

Finally, given the relevance of CVD in women and the knowledge that such pathologies can be prevented through RF control, it is essential to understand local disparities in women's cardiovascular health and to develop public health actions that improve the prevention, diagnosis, and treatment of these pathologies. Accordingly, the "Women's Charter" and the "Position on Cardiovascular Health in Women" published in the Brazilian Archives of Cardiology by the Department of Women's Cardiology, established concrete actions to reduce CVD morbidity and mortality in women and provided existing evidence of the topic, to promote gender equality in health in Brazil, and achieve the global goal of reducing the mortality rate by 30% by 2030.[8,18]

Author Contributions

Conception and design of the research, acquisition of data, analysis and interpretation of the data, statistical analysis, obtaining financing, writing of the manuscript and critical revision of the manuscript for intellectual content: Larissa Franco de Andrade, Paolo Blanco Villela, Jose Lucas Peres Bichara, Luiz Antonio Viegas de Miranda Bastos, Glaucia Maria Moraes de Oliveira.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Ethics Approval and Consent to Participate

This article does not contain any studies with human participants or animals performed by any of the authors.

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