ORIGINAL ARTICLE

Mortality of women of childbearing age in Brazil from 2006 to 2019: causes and trends

Silmara Bruna Zambom Albert*
Katrini Guidolini Martinelli**
Eliana Zandonade***
Edson Theodoro do Santos Neto****

The objective of this study is to analyze the trend of the main causes of death of women of childbearing age (FIM) in Brazil, by age group, from 2006 to 2019. Data from the Mortality Information System (SIM) and the Brazilian Institute of Geography and Statistics (IBGE). The main causes of death of FIM (10 to 49 years old) were classified by chapters of the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Subsequently, a temporal trend analysis was carried out using polynomial regression models of the main causes of death in FIM according to age group. In Brazil, the highest mortality rates per cause per 100,000 FIM were due to neoplasms (25.34), diseases of the circulatory system (20.15), external causes (18.69), infectious and parasitic diseases (8 ,79) and diseases of the respiratory system (6,37). For the analyzed period, after standardization, the mortality rates for diseases of the circulatory, respiratory and infectious and parasitic systems showed a downward trend, with a significant drop of 26.6% for diseases of the circulatory system; mortality rates from external causes and neoplasms showed an increasing trend from 2006 to 2012 and a decreasing trend from 2013 onwards.

External causes and neoplasms were the main causes of death, especially among younger women and with an increasing trend. Since this is an important public health problem, it is necessary to plan actions that optimize resources and improve women's quality of life and health.

Keywords: Women's health. Causes of death. Mortality. Comprehensive health care.

* Federal University of Espírito Santo (Ufes), Vitória-ES, Brazil (sbzambon@hotmail.com; https://orcid.org/0000-0002-0661-2193).

** Federal University of Espírito Santo (Ufes), Vitória-ES, Brazil (katrigm@gmail.com; https://orcid.org/0000-0003-0894-3241).

*** Federal University of Espírito Santo (Ufes), Vitória-ES, Brazil (elianazandonade@uol.com.br; https://orcid.org/0000-0001-5160-3280).

**** Federal University of Espírito Santo (Ufes), Vitória-ES, Brazil (edsontheodoro@uol.com.br; https://orcid.org/0000-0002-7351-7719).

Introduction

Women represent more than 50% of the Brazilian population and, among them, 63.8% correspond to the female population of childbearing age (FIM), aged between 10 and 49 years (IBGE, 2018). With the transformations in the socioeconomic scenario, the cultural revolutions and the strength of the feminist movement in the 20th century, new social configurations emerged, jointly weakening the dichotomy between the model of male provider and female caregiver (SOUSA; GUEDES, 2016). However, despite women acquiring more and more civil, political, social, economic and cultural rights, gender inequality still persists, which is revealed in lower income, lower education, less access to employment, in addition to a higher percentage of violence suffered for the simple fact of being a woman. All of this limits women's ability to protect their own health and contributes to illness and early deaths, many of which are preventable (MARTIN, 2018; NASCIMENTO

The situation of women's health began to involve several aspects of life, such as discrimination in work relationships, overload with the responsibilities of domestic work (BRASIL, 2004), growth in the consumption of tobacco, alcohol and illicit drugs, sedentary lifestyle, poor nutrition and risk behaviors for sexual health that begin in adolescence (MARTIN, 2018). In this scenario, health services need to offer comprehensive care, which is not restricted to curative practice, contemplating women at all levels of care and considering their social, family and cultural context.

According to data from the Ministry of Health, in 2019, the main causes of death of the female population of childbearing age in Brazil were: neoplasms, mainly breast, cervix and brain cancer; diseases of the circulatory system; external causes; and infectious and parasitic diseases, with a predominance of deaths in brown women (BRASIL, 2022).

The Mortality Information System (SIM) is a data source that has been widely used in recent decades, as it has satisfactory coverage and data quality for the construction of indicators that can support planning by management in the Unified Health System (SUS).) (FRIAS; SZWARCWALD; LIRA, 2014).
Mortality statistics are important tools for understanding the epidemiological profile of the population, elaborating health indicators, analyzing trends and indicating priorities in the elaboration of interventions (OLIVEIRA et al., 2019).

The woman lives with different types of threats to her integrity and existence, however, when the analysis is restricted to those who are of childbearing age, the pattern of deaths presents some typical characteristics of this age group, which may vary according to the conditions in which they are affected. women are included, age group and race/color. For this reason, it is always necessary to analyze the trend of these deaths (BRASIL, 2006).

Addressing female mortality of childbearing age thus contributes to monitoring health in the reproductive phase, facilitating the design and implementation of policies

for different productive life cycles, since women's health must be considered a public priority and requires resolute actions that reduce morbidity and mortality. Thus, this study aimed to analyze the trend of the main causes of death of women of childbearing age (FIM) by age group in Brazil, from 2006 to 2019.

Methods

This is an ecological time series study that addresses the main causes of death in FIM (10 to 49 years old) between 2006 and 2019, with the choice of causes based on the five chapters of ICD-10 with the highest mortality rates for the period. The data source was the Mortality Information System (SIM), available for public consultation on the Ministry of Health (MS) website (BRASIL, 2022). Data extraction took place in September 2021.

Initially, the total number of FIM between 2006 and 2019 in Brazil was collected using demographic statistics from the censuses and their projections (from 2010 onwards), and the number of deaths in FIM during the same period. Deaths were classified by chapters of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) (CBCD, 2003). To choose the ICD-10 chapters with the highest rates for the period, the mortality rate per cause per 100,000 FIM was calculated.

As this is a long period of analysis, due to important changes in the age structure of the Brazilian female population, the rates were standardized for the group of women of reproductive age, using as a reference the age structure of the Brazilian population in 2019 and the age groups 10-14, 15-19, 20-29, 30-39 and 40-49 years. To calculate the expected number of deaths, the annual mortality rate from causes per 100,000 FIM observed and by age group was multiplied by the female population in 2019 (standard population) in the same age group and divided by 100,000 .

Then, to calculate the standardized mortality rate per cause per 100,000 FIM for the period, the number of expected deaths for each ICD-10 chapter was added and divided by the standard population.

After selecting the five chapters of the ICD-10 with the highest rates - I (some infectious and parasitic diseases), II (neoplasms - tumors), IX (diseases of the circulatory system), X (diseases of the respiratory system) and XX (external causes of morbidity and mortality) –, the three main groups of ICD-10 were described with the objective of deepening the most important causes of death.

The calculation of the mortality rate due to causes per 100,000 FIM specified by ICD-10 chapter, according to age group (n. deaths/n. FIM in each age group*100,000). The age groups were categorized into: 10-14, 15-19, 20-29, 30-39 and 40-49 years. Subsequently, the five ICD-10 chapters with the highest mortality rates for both the FIM set and for each age group were analysed, with regard to their distribution and temporal evolution. Thus, models of

polynomial regression for chapters I, II, IX, X, XV (only for the 15-19 age group) and XX, as they represented one of the five main causes of death in any of the analyzed age groups. In addition, the temporal evolution of chapter XVIII – symptoms, signs and abnormal findings of clinical and laboratory tests – was also analyzed, in order to observe the behavior of ill-hed defined causes.

Scatter diagrams were drawn between the mortality rate per 100,000 FIM and the years of study to visualize the function that could express the relationship between them. Then, the polynomial regression models were estimated, which could be: simple linear ($Y = ÿ0 + ÿ1*X$), second-degree ($Y = ÿ0 + ÿ1*X + ÿ2*X2$) and third-degree ($Y = ÿ0 + ÿ1*X + ÿ2*X2 + ÿ3*X3$). Tests were performed sequentially. When two models were statistically significant, the one with the lowest order was chosen.

The trend was considered increasing or decreasing when the estimated model obtained p-value <0.05 (LATORRE; CARDOSO, 2001).

The determination coefficients (R^2 and adjusted R^2) were used as a measure of accuracy of the polynomial regression model. Residual analysis was carried out to confirm the assumption of homoscedasticity of the models. The calculation of mortality rates and graphs of historical series were prepared in Microsoft Office Excel, version 14.0 for Windows 2016, and trend analyzes were performed in the STATA program, version 14.1.

Due to the use of public domain data, with unrestricted access, to carry out the research, this study is waived by the National Research Ethics Commission (Conep) from analysis of the Research Ethics Committee (CEP) system.

Results

After calculating the standardized FIM death rates in Brazil, from 2006 to 2019, it was observed that the most relevant chapters were: neoplasms (25.34 deaths per 100,000 FIM), circulatory system diseases (20.15 /100 thousand FIM), external causes (18.69/100 thousand FIM), infectious and parasitic diseases (8.79/100 thousand FIM), diseases of the respiratory system (6.37/100 thousand FIM) and symptoms, signs and abnormal findings from clinical and laboratory tests (6.28/100,000 FIM), which include ill-defined causes (Table 1).

Table 2 shows the three main death groups for the five ICD-10 chapters with the highest mortality rates per 100,000 FIM. Thus, among the main specific causes of death from FIM, the human immunodeficiency virus (Chapter I), accidents (Chapter XX) and influenza/pneumonia (Chapter X) stand out, which represent about 50% of deaths in their respective chapters, while cerebrovascular diseases, accidents and assaults stand out for the high number of cases in total.

TABLE 1

Mortality rates of women of childbearing age (1), according to ICD-10 chapters
Brazil – 2006-2019

ICD-10 chapters	observed rate	Standardized
I: Some infectious and parasitic diseases	8,42	rate 8.79
II: Neoplasms (tumors)	24,08	25,34
III: Diseases of the blood	1,16	1,18
IV: Endocrine, nutritional and metabolic diseases	4,48	4,70
V: Mental and behavioral disorders	1,05	1,11
VI: Diseases of the nervous system	2,85	2,88
VII: Diseases of the eye and adnexa	0,00	0,00
VIII: Diseases of the ear and mastoid process	0,03	0,03
IX: Diseases of the circulatory system	18,99	20,15
X: Diseases of the respiratory system	6,13	6,37
XI: Diseases of the digestive system	4,98	5,23
XII: Diseases of the skin and subcutaneous tissue	0,31	0,32
XIII: Diseases of the musculoskeletal system and connective tissue	1,32	1,35
XIV: Diseases of the genitourinary system	2,21	2,30
XV: Pregnancy, childbirth and the puerperium	2,80	2,80
XVI: Conditions originating in the perinatal period	0,02	0,02
XVII: Congenital malformations, deformities and chromosomal anomalies	0,74	0,73
XVIII: Symptoms, signs and abnormal clinical and laboratory findings	6,01	6,28
XX: External causes of morbidity and mortality	18,56	18,69

Source: Ministry of Health. Mortality Information System (SIM). Elaboration of the authors.
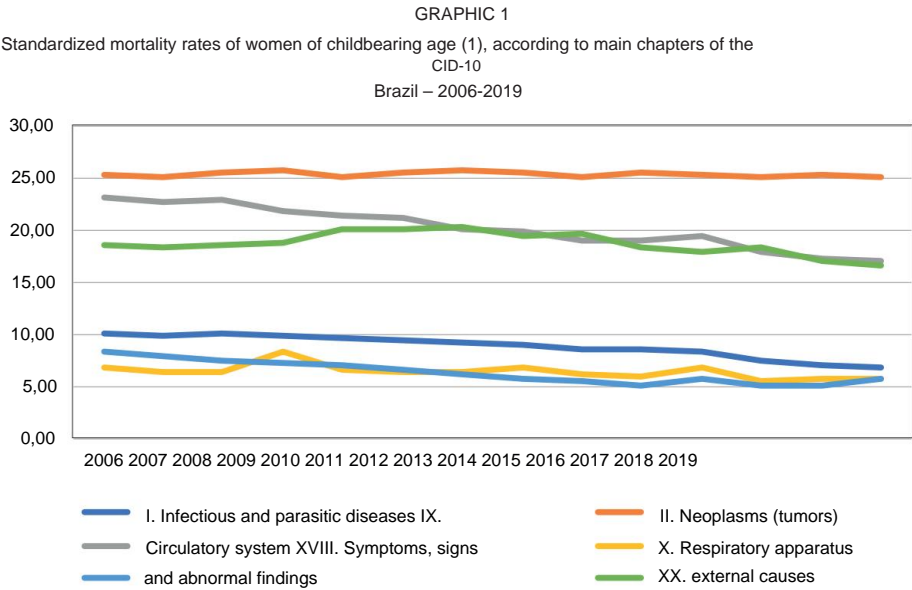(1) For 100 thousand MIF.

TABLE 2

Deaths of women of childbearing age, according to the main groups of causes of the ICD-10 chapters with the highest mortality rates

Brazil – 2006-2019

Chapter/group CID-10	N	%
I: Some infectious and parasitic diseases	74.234	
B20-B24: Human immunodeficiency virus (HIV) disease	42.010	56,59
A15-A19: Tuberculosis	6.296	8,48
B50-B64: Diseases due to protozoa	3.392	4,57
II: Neoplasms (tumors)	212.298	
C50-C50: Malignant breast neoplasms	47.406	22,33
C51-C58: Malignant neoplasms of female genital organs	44.604	21,01
C15-C26: Malignant neoplasms of digestive organs	40.036	18,86
IX: Diseases of the circulatory system	167.413	
I60-I69: Cerebrovascular diseases	55.219	32,98
I20-I25: Ischemic heart disease	41.504	24,79
I10-I15: Hypertensive diseases	18.531	11,07
X: Diseases of the respiratory system	54.050	
J09-J18: Influenza (gripe) e pneumonia	28.017	51,84
J40-J47: Chronic diseases of the lower airways	10.095	18,68
J80-J84: Other respiratory diseases that primarily affect the interstitium	5.488	10,15
XX: External causes of morbidity and mortality	163.665	
V01-X59: Accidents	78.465	47,94
X85-Y09: Assaults	50.410	30,80
X60-X84: Intentional self-harm	21.962	13,42

Source: Ministry of Health. Mortality Information System (SIM). Elaboration of the authors.

When analyzing the set of deaths from FIM, in the period considered, a decreasing trend is observed in the standardized mortality rates due to infectious and parasitic diseases, of the respiratory system and, mainly, of the circulatory system, with the highest intensity of decrease (26, 6%). Mortality rates from neoplasms and external causes showed an increasing trend until 2012 and a downward trend for the rest of the period, although the rate from neoplasms varied very little. Ill-defined causes also registered a downward trend, with a reduction of 32%, as shown in Graph 1 and Table 3.

GRAPHIC 1

Standardized mortality rates of women of childbearing age (1), according to main chapters of the CID-10

Brazil – 2006-2019

Source: Ministry of Health. Mortality Information System (SIM); Brazilian Institute of Geography and Statistics (IBGE). Elaboration of the authors.
(1) For 100 thousand MIF.

According to the analysis by age groups, adolescents aged 10 to 14 years showed a decreasing trend in the mortality rate for the five chapters of the ICD-10 considered, with emphasis on external causes, which recorded the highest rate and intensity of falls (33 ,0%). As for adolescents aged 15 to 19 years, chapter XV (pregnancy, childbirth and the puerperium) appears as one of the five main causes of FIM death, with a decreasing trend for the period, along with neoplasms and diseases of the circulatory and death rate, while the mortality rate from external causes showed an increasing trend until 2012 (from 19.3 to 22.0 deaths per 100,000) and a decreasing trend for the rest of the period (15.6 per 100,000) (Table 3 and Graph 2).

TABLE 3

Temporal trend analysis of the mortality rate of women of childbearing age (1), according to age groups and main chapters of ICD-10

Brazil – 2006-2019

Variables	Model (2)	R	R2	b0	b1	B 2	b3	p-values
Total MIF								
D. infectious and parasitic Linear Neoplasms		0,946 0,940 8,864 -0,248 0,139 25,367						- <0,001
Linear		25,447 -0,010 0,456 0,799 0,263168 0,491						0,127
	Parable	-0,480 0,723 0,695 6,414 -0,106 0,256 0,181 18,880						- 0,009 -
circulatory system	Linear	-0,128 0,919 0,901 19,687 -0,128 -0,067 0,946 0,941						<0,001 -
respiratory system	Linear							<0,001 -
external causes	Linear							0,093
	Parable							- <0,001 -
Linear abnormal signs and symptoms		6,209 -0,260						<0,001
10-14 years								
D. infectious and parasitic Linear Neoplasms		0,881 0,869 1,462 -0,067 0,839 0,823						- <0,001 -
Linear Circulatory system Respiratory External		3,529 -0,049 0,554 0,509 1,505 -0,029						<0,001 -
causes	Linear	0,755 0,730 1,768 -0,039 0,971 0,968						0,006 -
	Linear							<0,001
	Linear	7,730 -0,243						- <0,001
15-19 years								
Neoplasms	Linear	0,691 0,660 4,414 -0,056 0,430 0,373						- <0,001
circulatory system	Linear	2,899 -0,033						0,021
respiratory system	Linear	0,560 0,516 2,666 -0,032 0,661 0,627						- 0,005 -
Pregnancy, childbirth and puerperium Linear		2,743 -0,026 0,854 0,847 20,865 -0,175 0,820 0,193						0,001 0,09 -
external causes	Linear	-0,089						
	Parable							<0,001
20-29 years								
D. infectious and parasitic Linear Neoplasms		0,988 0,987 5,300 -0,191 0,397 0,336						- <0,001 -
Linear Circulatory system Linear Respiratory system		7,648 0,017						0,028
		0,916 0,908 5,664 -0,074 0,648 0,613						- <0,001 -
	Linear	3,546 -0,081 0,315 0,247 21,120 -0,159						0,002 - 0,057
external causes	Linear	0,839 0,803 21,920 -0,159 -0,067						- <0,001
	Parable							
30-39 years								
D. infectious and parasitic Linear Neoplasms		0,970 0,968 12,042 -0,476 0,859 0,845						- <0,001 -
Linear Circulatory system Linear Respiratory system		24,832 0,155						<0,001
		0,955 0,951 17,517 -0,318 0,750 0,725						- <0,001 -
	Linear	6,212 -0,122 0,012 0,000 0,927 0,913 40,076 0,854						<0,001 -
external causes	Linear	-0,026 -0,076						0,733 -
	Parable							<0,001
40-49 years								
D. infectious and parasitic Linear Neoplasms		0,788 0,766 16,898 -0,266 0,624 0,586						- <0,001 -
Linear Circulatory system Linear Respiratory system		70,147 -0,211 0,994 0,993 59,935 -1,638						0,002
External causes		0,664 0,630 14,597 -0,190 0,199 0,119						- <0,001 -
	Linear	20,458 -0,124 0,921 0,903 21,382 -0,125						0,001 0,145
	Linear	-0,077						- -
	Parable							<0,001

Source: Ministry of Health. Mortality Information System (SIM); Brazilian Institute of Geography and Statistics (IGBE). Elaboration of the authors.
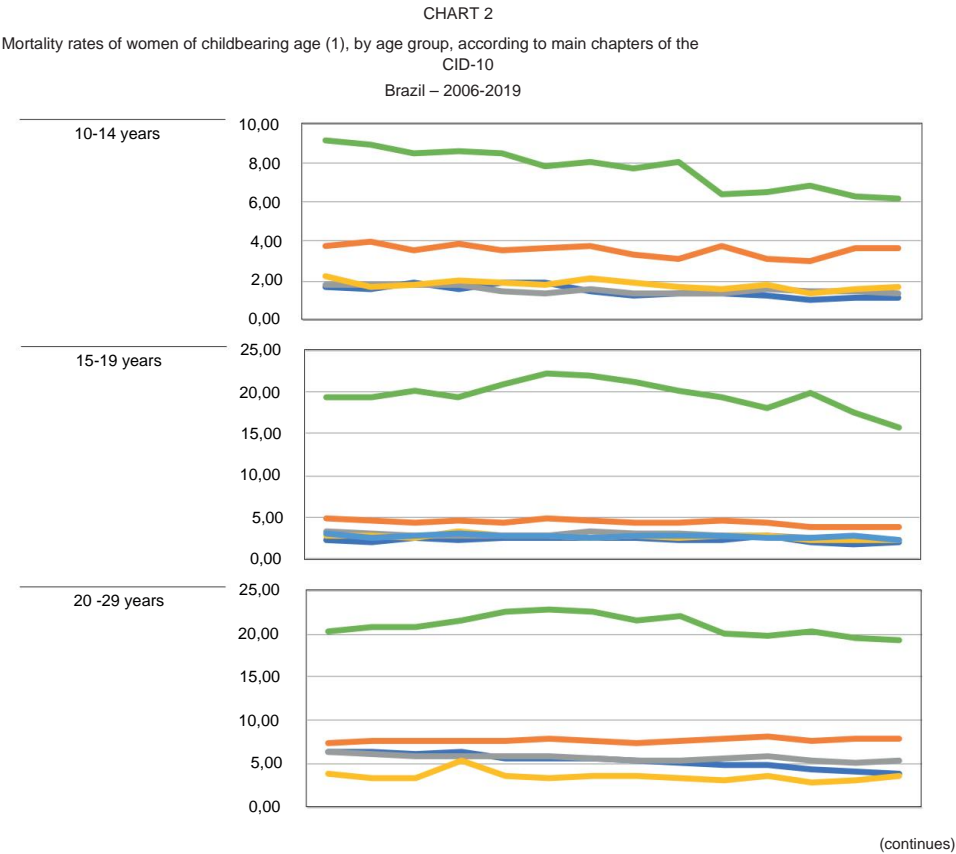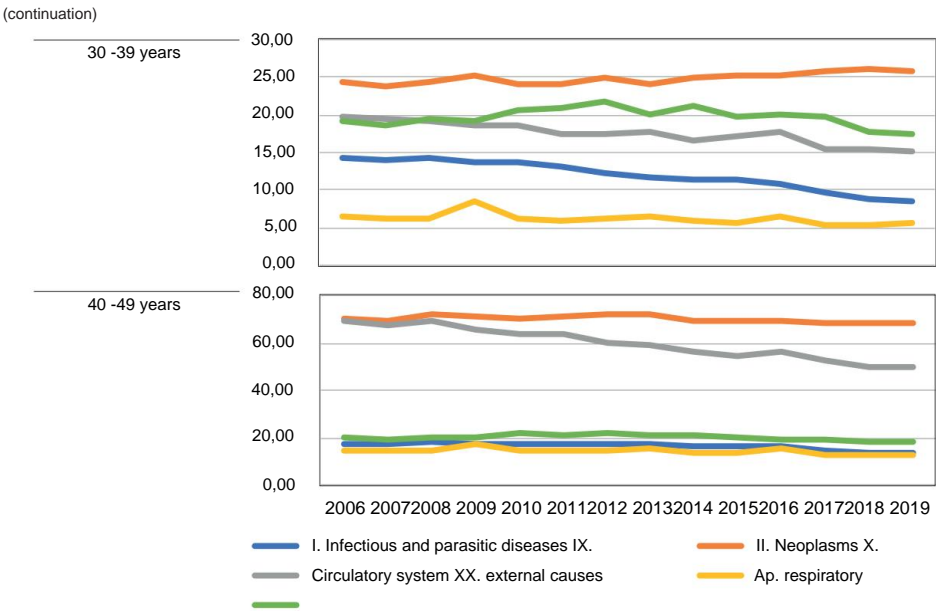
(1) For 100 thousand MIF.

(2) The analysis of the residuals of each polynomial regression model showed, in practically all cases, that the dispersion of the residuals is the same along x, confirming the assumption of homoscedasticity.

For the age groups from 20 to 29 and 30 to 39 years old, mortality rates from infectious and parasitic diseases, circulatory and respiratory system diseases showed a downward trend, with the greatest drop being observed for infectious and parasitic diseases. The mortality rate due to neoplasia registered an increasing trend for the period, but with low intensity, around 5%. Also, the mortality rate from external causes showed an increasing trend until 2012 and a decreasing trend for the rest of the period (Table 3 and Graph 2).

Finally, for the 40 to 49 age group, all causes, except external ones, showed a decreasing mortality rate for the period, with emphasis on diseases of the circulatory system, with the greatest drop (28.7%). The mortality rate from external causes registered an increasing trend until 2012 and a decreasing trend for the rest of the period, however, with little change (Table 3 and Graph 2).

It is noteworthy that the mortality rate from external causes shows the highest values for the age groups 10 to 14, 15 to 19 and 20 to 29 years, while neoplasms predominate in women aged 30 to 39 and 40 to 49 years (Graph 2) .

CHART 2

Mortality rates of women of childbearing age (1), by age group, according to main chapters of the CID-10

Brazil – 2006-2019

(continuation)

30 -39 years

40 -49 years

2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

I. Infectious and parasitic diseases IX.   II. Neoplasms X.

Circulatory system XX. external causes   Ap. respiratory

Source: Ministry of Health. Mortality Information System (SIM); Brazilian Institute of Geography and Statistics (IBGE). Elaboration of the authors.

(1) For 100 thousand MIF.

Discussion

The results of this study contribute to knowledge about the mortality of women of childbearing age in Brazil according to age group, showing that external causes and neoplasms were the main causes of death, especially among younger women and with a growing trend for some age groups. age groups. Given the growing participation of women in the production process, the deaths of women of childbearing age are, therefore, an important public health problem.

Among younger women, the main cause of death was due to external causes, with a decreasing trend from 2012 onwards. In addition, almost half (47%) of deaths due to external causes were caused by accidents, in addition to assaults, which were in second place. The downward trend after 2012 can be attributed, in part, to the tightening of Law n. 11.705/2008 (Prohibition), which became stricter and more applicable, with a greater fight against the habit of drinking alcohol before driving. In addition, cell phone use and speeding also became more closely monitored, which led to a reversal in the mortality rate from traffic accidents, which had been rising, but started to decline from that year onwards (NADANOVSKY; SANTOS , 2021).

With regard to aggressions, high female mortality rates are an indicator of gender violence. Violence against women comprises a very wide range of actions, such as threats, psychological torture, verbal aggression, physical and psychological violence.

sex, among others. This evokes the need to reinforce the actions provided for in the Maria da Penha Law, instituted in 2006 (LEITE et al., 2017). However, despite the creation of this important defense mechanism, annual mortality rates have not suffered an impact, remaining stable or increasing in the 10-19 age group in Brazil, between 2000 and 2017. the fact that women die from aggression simply because they are women has gained increasing prominence; therefore, this classification of death as femicide causes an increase in the numerator, keeping the rate high, which makes it seem that the Maria da Penha Law does not work (ARAGÃO et al., 2020). The possibility that these rates are the result of increasing conservatism in Brazilian society is also not excluded.

It is important to highlight that most deaths during adolescence could be avoided with better access to health, education and social support services.
However, in many cases, young people do not get assistance in essential prevention and care services – either because the services do not exist, or because they are not aware of them (MARTIN, 2018).
For women aged 30 to 49 years, the high number of deaths from neoplasms stands out, a fact already evidenced in other studies carried out in Brazil (MADEIRO et al., 2018; SOMAVILLA; DE ABREU PEREIRA, 2020). It is necessary, however, to emphasize the high mortality due to malignant neoplasms of the breast and cervix, characteristics that appear as the main causes of death in less developed and developing regions (SOMAVILLA; DE ABREU PEREIRA, 2020). Such pathologies require early diagnosis and treatment to obtain better prognoses, survival or cure. In addition, cervical cancer prevention campaigns should be intensified through the Pap smear test and vaccination against HPV, generating women's empowerment, which adds to the need for the service network to maintain a constant flow and reference and counter-reference in the care of these women.

A growing trend of deaths from neoplasms was identified in young adult women (20 to 39 years old) who develop early cancer, especially breast cancer.
Some investigations have shown that screening women under 49 years of age could lead to overdiagnosis and overtreatment and, therefore, the Brazilian Ministry of Health recommends biennial mammography only for the 50-69 age group (DE SOUZA LÔBO et al., 2020). However, this recommendation is not an absolute rule, so health professionals need to pay close attention to women who have risk factors outside the recommended age range for screening, so that the diagnosis can be made in a timely manner, since that younger women usually arrive with advanced staging, worse prognosis and worse therapeutic response, compared to older women (BARBAROTTO et al., 2019).

As for women aged 40 to 49 years, diseases of the circulatory system gain prominence, and attention should be given to cerebrovascular and ischemic heart diseases,

that stand out among diseases of the circulatory system. It is known that, as the age group increases, the frequency of death due to circulatory system disorders increases (MADEIRO et al., 2018). Over the years, the cardiovascular system undergoes a series of changes, such as arteriosclerosis, decreased distensibility of the aorta and great arteries, impaired cardiac conduction, and reduced baror receptor function. Thus, age, disease, lifestyle or a combination of these three factors can result in a decline in circulatory function (ZASLAVSKY; GUS, 2002).

The Plan to Combat Chronic Noncommunicable Diseases (CNCD) presents several actions aimed at promoting health, preventing and controlling diseases of the circulatory system, such as: surveillance of hypertension, comorbidities and their determinants; comprehensive care; and health promotion, investment in education and social mobilization, which enhance and qualify self-care and the construction of healthy habits (BRASIL, 2021).

A study carried out by Bonotto, Mendoza-Sassi and Susin (2016) showed that arterial hypertension and smoking were the most frequently identified risk factors for the development of cardiovascular diseases (CVD), and knowledge of these factors is directly influenced by sociodemographic characteristics of populations with inequalities according to income and education. This makes explicit the need to intensify education programs for the prevention of chronic diseases and, in particular, for the dissemination of factors associated with CVD among the poorest groups.

Among adolescents aged 15 to 19 years, causes related to pregnancy, childbirth and the puerperium – maternal causes (chapter XV) – were one of the five most frequent mortality rates, being represented mainly by hypertensive diseases and complications at work delivery, corroborating previous findings that suggest that hypertensive diseases are the second leading cause of maternal death in the world among direct causes and are the most prominent cause in the Latin American region (SAY et al., 2014).

This demonstrates that teenage pregnancy is still a relevant problem in Brazil and that sexual and reproductive health policies aimed at this group should emphasize comprehensive and quality sexual education, in addition to adapting campaigns for the prevention of unsafe pregnancy. planned to the reality of adolescents (ASSIS et al., 2021), offering adequate contraceptive methods, and, for those who really want to get pregnant, offering comprehensive prenatal care for normal or high-risk prenatal care, as well as guaranteeing access and quality childbirth, reducing risk and preventing or minimizing complications.

Chapter XVIII, the main representative of ill-defined causes, presented a significant rate for the period under study, showing that the underlying cause of death registered in the SIM requires better quality. However, it should be noted that there are methodological proposals to work with these causes, including redistribution

proportion of ill-defined causes (IDCDs) or unspecific causes of no relevance to public health, which consists of treating the causes of death and uses weights generated by statistical models and redistributed by algorithms among the group of defined causes as a basis, with the aim of to reduce underreporting of underlying causes (TEIXEIRA et al., 2021). In addition, it is important to remember that the aforementioned chapter has shown increasingly lower values in the SIM (BRASIL, 2022).

This study has some limitations that deserve to be considered. As this is secondary data, it is important to emphasize that inadequate completion of death certificates (DC) causes damage to the flow of information and the loss of data transmitted to the SIM causes difficulties in the elaboration of health diagnoses and makes effective actions in this sector unfeasible. , a condition that may be related to the professionals' lack of commitment and attention to the mentioned document. However, it should be noted that ill-defined causes showed a decreasing trend, which shows that the completion of death certificates has improved over time.

Although the SIM represents the most reliable data source in the country, the scientific literature reveals that there are still obstacles to properly filling out the DC, consequently, there is a limitation in the quality of the data (OLIVEIRA et al., 2019), mainly in regions that need to overcome the problems related to incomplete coverage, the irregularity of event notifications and the low quality of data on cause of death (FRIAS; SZWARCWALD; LIRA, 2014). Still, it is necessary to invest in strategies for the correct notification of deaths in order to reach a real dimension of the problem, highlighting the importance of using the death certificate as an instrument for the elaboration of health statistics, which will support the development of actions and preventable death prevention programs (RIBEIRO et al., 2012).

Despite these limitations, the present study sheds new light on the death profile of women of childbearing age in Brazil. If, on the one hand, there is a limitation in data collection and in filling out death certificates, on the other hand, there is evidence of amplification of vulnerability, especially in deaths resulting from neoplasms
and external causes.

Conclusion

The mortality pattern found in the present study reveals the recent scenario of deaths in the Brazilian female population of childbearing age, and the main underlying causes found could be avoided through the implementation of intervention and health promotion measures. It should be noted that the data predates the Covid-19 pandemic. Population studies including the years 2020 onwards should be recommended in order to verify the impact of the pandemic on the mortality patterns of women of childbearing age in Brazil.

The reduction of FIM deaths is of great relevance for public health, as these are women in the most productive stage of life. However, interventions are complex and require multiple responses directed at specific life cycles: adolescent, youth and adult. Therefore, this study points out the main recent trends in the causes of death of FIM by age group, providing directions to the State and Brazilian society for effective interventions, in the context of the prevention of teenage pregnancy, the diagnosis and early treatment of female neoplasms , the prevention and monitoring of cardiovascular diseases or the prevention of accidents and violence.

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About the authors

Silmara Bruna Zambom Albert has a master's degree in Collective Health. Nurse at the Hospital-Day e Maternidade Unimed Vitória.

Katrini Guidolini Martinelli holds a PhD in Epidemiology in Public Health. Substitute Professor at the Department of Social Medicine at the Federal University of Espírito Santo (Ufes).

Eliana Zandonade holds a PhD in Statistics. Full Professor at the Department of Statistics from the Federal University of Espírito Santo (Ufes).

Edson Theodoro do Santos Neto holds a PhD in Public Health Epidemiology. Associate Professor at the Department of Social Medicine at the Federal University of Espírito Santo (Ufes).

mailing address

Silmara Bruna Zambom Albert

Rua José Luiz Gabeira, 170, apartment 1604, block D, Barro Vermelho 29057-570 ÿ Vitória-ES, Brazil

Katrini Guidolini Martinelli

Department of Social Medicine, Federal University of the Holy Spirit Av. Marshal Fields, 1468, Maruí 29040-090 ÿ Vitoria-ES, Brazil

Eliana Zandonade

Department of Social Medicine, Federal University of Espírito Santo Av. Marechal Campos, 1468, Maruípe 29040-090 ÿ Vitória-ES, Brazil

Edson Theodoro do Santos Neto

Department of Social Medicine, Federal University of Espírito Santo Av. Marechal Campos, 1468, Maruípe 29040-090 ÿ Vitória-ES, Brazil

Abstract

Mortality of women of fertile age between 2006 and 2019: causes and trends

The aim of this study is to analyze the trend of the main causes of death of women of reproductive age (WRA) in Brazil by age group from 2006 to 2019. Data used are from the Mortality Information System (SIM) and the Brazilian Institute of Geography and Statistics (IBGE) of Brazil. The main causes of death of WRA (10 to 49 years) were divided by chapters as per the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Subsequently, a temporal trend analysis was performed using polynomial regression models for the main causes of death in WRA. In Brazil, the highest mortality rates by cause by 100,000 WRA occurred due to: neoplasms (25.34), diseases of the circulatory system (20.15), external causes (18.69), infectious and parasitic diseases (8.79) and respiratory system diseases (6.37). For the analyzed period, after standardization, the mortality rate due to diseases of the circulatory and respiratory systems, and infectious and parasitic conditions showed a decreasing trend, with a significant drop of 26.6% for diseases of the circulatory system; while external causes and neoplasms showed an

increasing trend from 2006 to 2012 and decreasing from 2013 onwards. Identifying the main causes of death of WRA in each age group is required to guide the planning of actions to optimize resources and obtain better results in women's health.

Summary

Mortality of women of childbearing age between 2006 and 2019: causes and trends

The objective of this study is to analyze the trend of the main causes of death of women of childbearing age (MEF) in Brazil by age group from 2006 to 2019. With data from the Mortality Information System (SIM) and the Brazilian Institute of Geography and Statistics (IBGE) of Brazil, the main causes of death of MEF (10 to 49 years) were divided by chapters of the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Then, a temporal trend analysis was made using polynomial regression models of the main causes of death in MEF. In Brazil, the highest mortality rates by cause in FEM/100,000 women occurred from neoplasias (25.34), diseases of the circulatory system (20.15), external causes (18.69), infectious and parasitic diseases (8.79) and diseases of the respiratory system (6,37). For the period analyzed, after standardization, the mortality rate from neoplasms and from diseases of the circulatory, respiratory and infectious and parasitic systems showed a decreasing trend, with a significant drop of 26.6% for diseases of the circulatory system, while that external causes and neoplasms showed an increasing trend between 2006 and 2012 and a decreasing trend from 2013 onwards. Identifying the main causes of death in MEF in each age group guides the planning of actions to optimize resources and obtain better results in women's health.