

## Mortality profile of women of childbearing age due to natural causes in the state of Sergipe: a retrospective study

### *Perfil da mortalidade de mulheres em idade fértil por causas naturais no estado de Sergipe: um estudo retrospectivo*

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**ABSTRACT:** This is a retrospective ecological study with the objective of describing the mortality of women of reproductive age due to natural causes from 2000 to 2015, in Sergipe. Death certificates were collected in the Mortality Information System and population estimates were obtained from the Ministry of Health. The cases selected were classified according to their preventability and analyzed in the Tabwin program. During the period, there were 8,945 deaths from natural causes. Of these, the highest coefficients were of: women aged 40 to 49 years, hospital deaths, and residents of the Health Region of Propriá. Regarding preventable causes, there was an increase of 11.1% between the first and the last quadrennium, with the coefficient of non-communicable diseases standing out. There was a decrease of 0.4% and 70.6% in non-preventable and ill-defined causes, respectively. Regarding the percentage of cases according to race/color, civil status and education, women who were *pardas*, single and with 4 to 7 years of education stood out. Thus, investments in actions aimed at reducing deaths from preventable causes and guaranteeing quality and resoluteness in health care are necessary.

**Keyword:** Women's health; Mortality, premature; Cause of death; Health information systems; Brazil/epidemiology.

**RESUMO:** Trata-se de um estudo ecológico retrospectivo com o objetivo de descrever a mortalidade de mulheres em idade fértil por causas naturais, de 2000 a 2015, em Sergipe. As declarações de óbitos foram coletadas do Sistema de Informação de Mortalidade e as estimativas populacionais foram obtidas junto ao Ministério da Saúde. Os casos selecionados foram classificados quanto à evitabilidade e foram analisados pelo programa Tabwin. Durante o período, ocorreram 8.945 óbitos por causas naturais. Destes, apresentaram os maiores coeficientes: mulheres na idade de 40 a 49 anos, óbitos hospitalares e residentes na Região de Saúde de Propriá. Quanto às causas evitáveis, considerando o primeiro e o último quadriênio, houve um aumento de 11,1%, destacando-se o coeficiente por doenças não transmissíveis. Entre as causas não evitáveis e mal definidas, houve diminuição de 0,4% e de 70,6%, respectivamente. Em relação ao percentual dos casos segundo raça/cor, estado civil e escolaridade, destacaram-se as pardas, solteiras e com escolaridade entre 4 e 7 anos. Assim, são necessários investimentos em ações que visem a redução dos óbitos por causas evitáveis e garantam a qualidade e a resolutividade na atenção à saúde.

**Palavras-chave:** Saúde da mulher; Mortalidade prematura; Causas de morte; Sistemas de informação em saúde; Brasil/epidemiologia.

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## INTRODUCTION

Aiming to improve women's health in Brazil, the National Policy for Comprehensive Care for Women's Health (PNAISM), created in 2004, determines principles and guidelines to improve the quality of life and health of this population, reducing morbidity and mortality and expanding, qualifying, and humanizing comprehensive care for women's health in the Unified Health System (SUS)<sup>1</sup>. In addition, Ordinance N° 1.119 of 2008 made it mandatory to investigate maternal deaths and deaths of women of childbearing age, regardless of the reported cause of death<sup>2</sup>. Knowing the determining and conditioning factors of the causes of death can enable the development of public policies to reduce deaths, especially those of preventable causes.

In 2015, the member states of the United Nations (UN) came together to approve the seventeen Sustainable Development Goals, which must be implemented by 2030. Among them, the 3rd Sustainable Development Goals aims to ensure healthy lives and promote well-being for all at all ages, especially for children, women and carriers of communicable diseases<sup>3</sup>.

Preventable causes of deaths are those that could be reduced by effective actions of an accessible health system at a given place and time<sup>4</sup> and are an indicator in health care. In Brazil, a group of experts published, with the support of the Ministry of Health, a list of causes of deaths that could be prevented by SUS interventions. The document was published in 2007 and updated in 2011<sup>5,6</sup>. This systematization is an important object of study, as it indicates a possibility of reducing mortality in primary care or with the identification of sentinel events (that is, detection of preventable diseases, disabilities, or unexpected deaths)<sup>7</sup>, encouraging the monitoring of public health policies to reduce these deaths.

This knowledge is important for planning actions aimed at women's health in the Brazilian state of Sergipe, since, considering their mortality profile and the concept of health as a right, it can facilitate the adoption of measures aimed at offering better and more humane healthcare<sup>1</sup>. Thus, this study was carried out with the objective of describing the mortality from natural causes of women of childbearing age from 2000 to 2015 in the state of Sergipe.

## METHODOLOGY

This was a retrospective descriptive ecological study with a quantitative approach. Information about deaths were obtained from Death Certificates in the Mortality Information System<sup>8</sup>. The TabWin software was used for data analysis<sup>9</sup>. Population estimates were obtained from

the MH<sup>10</sup>.

According to international definitions, the childbearing age of women is between 15 and 49 years old<sup>7</sup>. However, in Brazil, the Ministry of Health expanded this age group to 10 to 49 years old, due to the high number of teenage pregnancies<sup>1</sup>. Thus, this work was carried out with women from 10 to 49 years who lived in Sergipe and died from natural causes between January 1<sup>st</sup>, 2000 and December 31<sup>st</sup>, 2015.

The cases selected were classified according to the Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10)<sup>11</sup> and divided into preventable, non-preventable and ill-defined causes<sup>6</sup>. Preventable natural causes of death are those that could be reduced by vaccination campaigns; by appropriate health promotion, prevention, control, and care for infectious diseases; by appropriate health promotion, prevention, control, and care for non-communicable diseases; or by appropriate prevention, control, and care for causes of maternal death<sup>6</sup>.

The variables used were: quadrennium of death, age group, place of occurrence, health region of residence, basic natural cause of death according to preventability, race/color, civil status, and education. Mortality percentages and coefficients were calculated for each variable.

This study was approved by the Research Ethics Committee (CEP) of the Federal University of Sergipe (UFS), under the CAAE number: 80188117.7.0000.5546.

## RESULTS

In Sergipe, from 2000 to 2015, 10.982 deaths of women of childbearing age were registered, of which 8.945 were of natural causes. Mortality from natural causes among women of childbearing age were higher in the age group of 40 to 49 years and in the first quadrennium. All age groups showed a decreasing tendency in the period analyzed. Regarding the place of occurrence of death, the highest coefficients were related to hospital deaths and there was a significant reduction in household deaths (34.6%). Regarding the health region of residence, the highest mortality rates were in the health region of *Propriá*, but with a downward trend. The HR of *Nossa Senhora da Glória* had the lowest coefficients in all quadrennium (Table 1).

Mortality from vaccine-preventable diseases was practically absent in the period. Deaths of infectious causes increased over time. In the first quadrennium, septicemia was the infectious disease that led to the most deaths. However, in the last quadrennium, pneumonia and Acquired Immunodeficiency Syndrome (AIDS) increased by 75.0% and 180.0%, respectively, and septicemia decreased by 54.5%.

**Table 1.** Mortality coefficient of women of childbearing age due to natural causes (per 100.000), according to age group, place of occurrence, region of residence and quadrennium of death. Sergipe, 2000 to 2015

Characteristics	Mortality Coefficient			
	2000-2003	2004-2007	2008-2011	2012-2015
<b>Age Group</b>				
10 to 19	25.4	23.2	23.1	20.6
20 to 29	51.3	38.7	41.6	38.3
30 to 39	121.3	91.7	95.7	95.6
40 to 49	282.8	247.1	231.7	233.2
<b>Place of occurrence</b>				
Hospital	63.9	54.6	62.9	64.6
Another health institution	0.5	0.5	0.4	0.8
Household	24.3	19.9	17.4	15.9
Thoroughfare	1.7	1.7	2.1	1.1
Other	1.5	0.9	1.1	0.7
Unknown	0.6	0.3	0.2	0.1
<b>Health Region of Residence</b>				
Aracaju	92.3	76.5	80.7	76.8
Estância	99.9	84.9	90.5	90.6
Itabaiana	86.1	68.8	85.9	88.6
Lagarto	92.9	83.2	81.2	88.2
Nossa Senhora da Glória	69.8	72.5	78.3	72.4
Nossa Senhora do Socorro	93.6	73.0	87.8	87.9
Propriá	108.5	95.3	90.3	91.0

Source: DATASUS (2017), adapted by the authors.

The results showed that the preventable causes with the highest coefficients were non-communicable diseases, especially cerebrovascular diseases and breast cancer, with higher coefficients in the last quadrennium. It is important to highlight that all non-communicable diseases showed an increase from the first to the last quadrennium, with the exception of cerebrovascular diseases, which decreased by 22.4%. The coefficients of deaths related to pregnancy, childbirth, or puerperium, which are also preventable, decreased by 30.4%. Among the non-preventable causes, neoplasm of uterus part unspecified stood out, with an

increase of 50.0%. Ill-defined causes decreased by 70.6% (Table 2).

Regarding race/color, the highest percentage of deaths from natural causes among women of childbearing age were of women of unknown race, with rates of 53.3% and 4.6% in the first and last quadrennium, respectively. The percentage of cases with unknown civil status was 34.2% in the first quadrennium and 6.6% in the last one. As for education, this variable was not reported in 72.5% of cases in the first quadrennium and 10.4% in the last (Table 3).

**Table 2.** Mortality coefficient of women of childbearing age due to natural causes (per 100,000) according to preventability and quadrennium of death. Sergipe, 2000 to 2015

Causes of death	Mortality Coefficient			
	2000-2003	2004-2007	2008-2011	2012-2015
<b>PREVENTABLE</b>	<b>46.8</b>	<b>47.2</b>	<b>52.8</b>	<b>52.0</b>
<b>Preventable by vaccination</b>	<b>0.1</b>	<b>-</b>	<b>0.1</b>	<b>0.1</b>
Tuberculosis	0.0	0.0	0.1	0.0
Other vaccine-preventable diseases	0.0	0.0	0.1	0.1
<b>Preventable by appropriate health promotion, prevention, control, and care for infectious diseases</b>	<b>8.4</b>	<b>8</b>	<b>10.2</b>	<b>10.5</b>
Acquired Immunodeficiency Syndrome (AIDS)	1.0	1.5	2.8	2.8
Pneumonias	1.2	1.3	2.1	2.1
Septicemia	2.2	1.0	1.1	1.0
Chronic rheumatic heart disease	0.6	1.3	1.1	1.3
Other infectious diseases	3.4	2.8	3.2	3.3
<b>Preventable by appropriate health promotion, prevention, control, and care for non-communicable diseases</b>	<b>33.8</b>	<b>36.6</b>	<b>38.3</b>	<b>38.2</b>
Cerebrovascular diseases	6.7	5.3	5.8	5.2
Breast cancer	3.6	3.9	5.2	6.6
Acute myocardial infarction	3.0	3.7	4.0	4.2
Cervical cancer	3.6	3.4	3.4	4.1
Other non-communicable diseases	16.8	20.2	19.9	18.1
<b>Preventable by appropriate prevention, control, and care for causes of maternal death</b>	<b>4.6</b>	<b>2.7</b>	<b>4.2</b>	<b>3.2</b>
<b>NON-PREVENTABLE</b>	<b>25.5</b>	<b>23.8</b>	<b>26.8</b>	<b>25.4</b>
Neoplasm of uterus, part unspecified	1.0	1.3	1.3	1.5
Other lung diseases	2.0	2.0	1.2	0.8
Anaemias	1.0	0.7	1.0	1.0
Cardiomyopathies	0.7	0.9	0.8	0.7
Other non-preventable causes	20.8	18.9	22.4	21.5
<b>ILL-DEFINED</b>	<b>20.1</b>	<b>6.9</b>	<b>4.5</b>	<b>5.9</b>

Source: DATASUS (2017), adapted by the authors.

**Table 3.** Percentage of deaths of women of childbearing age due to natural causes, according to race, civil status, education and quadrennium of death. Sergipe, 2000 to 2015

Characteristic	Mortality percentage			
	2000-2003	2004-2007	2008-2011	2012-2015
<b>Race / color</b>				
White	15.6	18.8	22.7	23.8
Black	4.8	7.3	10.3	10.4
Yellow	0.2	0.6	0.7	0.3
<i>Parda</i>	26.0	44.3	60.4	60.9
Indigenous	0.1	0.1	0.0	0.0
Unknown	53.3	29.0	5.9	4.6
<b>Civil status</b>				
Single	34.1	53.6	59.5	53.1
Married	26.5	28.1	26.6	24.6
Widowed	2.3	2.4	2.4	2.3
Legally divorced	1.8	3.9	4.4	4.6
Stable union	1.1	0.7	2.0	8.9
Unknown	34.2	11.4	5.1	6.6
<b>Education</b>				
None	7.3	11.5	16.1	12.3
1 to 3 years	8.6	17.6	19.4	19.2
4 to 7 years	5.9	17.9	26.7	26.3
8 to 11 years	3.0	7.6	17.0	25.0
12 years and more	2.7	4.1	6.8	6.7
Unknown	72.5	41.4	14.0	10.4
Total	100.0	100.0	100.0	100.0

Source: DATASUS (2017), adapted by the authors.

## DISCUSSION

In recent decades, maternal mortality has been the object of many studies, with the objective of reducing its rates. However, the assessment of the overall picture of the mortality of women of childbearing age shows a higher number of deaths from diseases that are not related to the gestation period. This should also be analyzed, especially when it comes to preventable causes<sup>12</sup>.

The present study found that the mortality of women of childbearing age due to natural causes increased with age. The mortality coefficient was 10.8 times greater for the 40-49 age group than for the 10-19 group. This value was similar to that found in the microregion of Barbacena (Minas Gerais) from 1998 to 2012, where the mortality coefficient was 10.4 times greater in the first age group<sup>13</sup>. This fact may be associated with an increase in life expectancy and an improvement in the health condition of both regions. The age-related increase in the number of deaths of women of childbearing age due to natural causes was also observed in the province of Las Tunas (Cuba), where 77.9% of deaths were in the age group of 35 to 49 years old<sup>14</sup>.

Regarding the place of death, most deaths occurred in hospitals, followed by the household and thoroughfares. This result was similar to that found among indigenous women of childbearing age in the state of Pernambuco, between 2006 and 2012<sup>15</sup>. As for the health region of residence, *Propriá* had the highest mortality rates, followed by *Estancia*. The health region of *Nossa Senhora da Glória* had the lowest rates. The difference between regions may be associated with the difficulty in accessing health care or the precariousness of health services<sup>15</sup>.

Regarding the causes of death and the preventability criteria, vaccine-preventable diseases were irrelevant due to the low mortality rate among women of childbearing age, highlighting the evolution due to the inclusion of several vaccines in the National Immunization Program (PNI) and the work in primary care<sup>16</sup>.

In this study, infectious diseases were the third leading natural cause of death among women of childbearing age. In the microregion of Ipatinga (Minas Gerais), from 2006 and 2010, infectious and parasitic diseases were the fourth leading cause of death among women of childbearing age<sup>17</sup>.

Nevertheless, the results regarding infectious diseases in this study were positive when compared to studies with women of reproductive age in a tertiary health institution in Port Harcourt (Nigeria) and in the region of Mtubatuba (South Africa). In these studies, the main cause of death was infectious diseases, especially infections by the Human Immunodeficiency Virus (HIV)<sup>18,19</sup>. This scenario demonstrates that healthcare in Brazil is more advanced than in other developing countries. It is also important to highlight that achievements in HIV/AIDS control were

largely influenced by the 90-90-90 goal, which established that 90% people living with HIV would know their HIV status in order to reduce and stop transmission; 90% of people diagnosed would receive antiretroviral therapy; and 90% of HIV patients receiving treatment would have an undetectable viral load<sup>20,21</sup>. In addition, a study in Rajasthan (India) found that infectious and parasitic diseases were the leading cause of death among women of childbearing age, corroborating the improvement in the health status in Brazil and Sergipe<sup>22</sup>.

Preventable non-communicable diseases were the main natural cause of death among women of childbearing age in Sergipe, including cerebrovascular diseases and various types of malignant neoplasms, especially breast and cervical cancers. This epidemiological profile is similar to that reported in an analysis of the health situation and health surveillance of Brazilian women from 2000 to 2010 by the Ministry of Health<sup>23</sup>.

Cerebrovascular diseases are more prevalent in Sergipe, but the sum of deaths from all types of cancer exceeds its rates. In the Federal District and in Pernambuco, non-communicable diseases were the main cause of death among women of reproductive age and the most prevalent cause of death was neoplasms, which is similar to Sergipe<sup>12,24</sup>. The high percentage of deaths from neoplasms reinforces the importance of cancer screening and access to health services<sup>24</sup>.

This study found an increase in the rates of mortality from circulatory diseases over time. This scenario was similar to that found in the Northeast region from 2000 to 2010, but the opposite of what happened across the country<sup>23</sup>. The difference may be associated with increased prevalence of risk factors, difficulties in access to primary care or treatment, behavior changes due to the urbanization process (smoking, alcohol consumption, drug use, occupational exposure, inadequate nutrition, among others), or social inequality (including low education)<sup>25</sup>.

Maternal mortality had the lowest coefficients according to the preventability criteria, accounting for 3.8% of deaths among women of childbearing age in the last quadrennium. In Pernambuco, mortality during pregnancy, childbirth and puerperium had one of the lowest rates, ranging from 3.6 to 4.1%, depending on age<sup>12</sup>. In addition, the rates found in Sergipe are lower than the rate of 14.3%, found in a survey that assessed maternal mortality in Latin American and Caribbean countries<sup>26</sup>.

On the other hand, non-preventable causes of death, which can not be reduced by currently known preventive measures, had a high coefficient, standing out as the second leading cause of death from natural causes. The same was observed in Porto Velho (Rondônia) from 2009 to 2013<sup>7</sup>.

The coefficient of ill-defined causes of death decreased from the first to the last quadrennium. The percentage of ill-defined causes is considered an indicator that can be used to assess the quality of mortality

information: the higher this percentage, the less accurate the data is. Therefore, this result may indicate an increase in access to health services, which enables the identification of the cause of death and the improvement of the Mortality Information System management, as it qualifies the information<sup>27</sup>.

As for the race/color of women of childbearing age, the percentages of death were higher for *pardas*, followed by white and black women. In Porto Velho (RO), the frequency of deaths was also in this order<sup>7</sup>. However, in Ribeirão Preto (São Paulo), the frequency of death was higher among white women (62.4%), followed by *pardas* (17.1%) and black (10.5%)<sup>28</sup>. Thus, it is evident that mortality by race varies according to the locality.

As for civil status, single women had the highest mortality rate. In Ribeirão Preto (SP), the analysis of mortality according to civil status also showed higher rates among single women (40.6%), followed by married women (32.0%)<sup>28</sup>. The fact that the values are higher for single women may be associated with the high number of poor families headed by women, which generates an overload of responsibilities that can lead to stress and low health care seeking behavior.

Information on the level of education of women of childbearing age presented a high percentage of unknown data, especially in the first two quadrennium. In the last four-month period, 10.4% had an unknown level of education and the highest rate (26.3%) was of women with 4 to 7 years of education. However, this rate was lower than that found in Porto Velho (RO) from 2009 to 2013, where 40.9% of women had 4 to 7 years of education<sup>7</sup>. It should be noted that the percentage of unknown data in Porto Velho

was higher than in Sergipe throughout the entire period<sup>7</sup>.

Among the limitations of the present work, it is worth noting that this is a study based on secondary data, subject to problems regarding its quality, which should be managed with the application of techniques that identify errors or absent information<sup>29</sup>. The Mortality Information System is considered of great importance, as its information can be used to produce health indicators and epidemiological studies<sup>30</sup>. However, special attention should be taken when filling out the Death Certificates fields in order to reduce ill-defined causes and unknown information. Therefore, it is necessary to invest in training and continuing medical education for the proper completion of this document<sup>31,32</sup>.

## CONCLUSION

In this study, the highest coefficients of deaths were in the age group of 40 to 49 years old. However, all ages showed a tendency to decrease from 2000 to 2015. The coefficients of deaths in hospitals and of residents of the health region of Propriá also stood out. As for preventability, there was an increase in the coefficients of deaths due to infectious and non-communicable diseases. The women were mostly single, *pardas* and with a low level of education.

It is concluded that mortality in Sergipe is still mostly associated with preventable causes, which may indicate a lack of planning of health services and weaknesses in the care provided, revealing the need for investments in programs and actions aimed at reducing these deaths.

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