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Epidemiological aspects of maternal mortality in northeastern Brazil

# Epidemiological aspects of maternal mortality in northeastern Brazil

Aspectos epidemiológicos da mortalidade materna no nordeste Brasileiro
Aspectos epidemiológicos de la mortalidad materna en el nordeste de Brasil

**RESUMO**

Objetivos: Este estudo objetiva a construção de um perfil epidemiológico com exposição dos fatores sociais e de assistência à saúde relacionada à permanência do alto índice de mortalidade materno na região. Em prol da discussão na comunidade acadêmica e direcionamento de políticas públicas. Método: Trata-se de um estudo epidemiológico de caráter retrospectivo e quantitativo, com base nos dados coletados na plataforma DATASUS, através do SIM, de 2009 a 2019, tabulando dados no Excel na forma de tabelas. Resultado: Os óbitos prevaleceram em 2009 (10%), na Bahia (25%), na raça parda (66,37%), entre 20 a 29 anos (40,39%), em mulheres solteiras (48%), no puerpério (48,52%), em ambiente hospitalar (89,31%), por causa obstétrica direta (69,1%) e 23% pela categoria CID O99. Conclusão: Espera-se que os resultados deste estudo contribuam para melhor direcionamento de políticas públicas para reduzir os óbitos maternos.
**DESCRITORES:** Saúde da mulher; Gestação; Epidemiologia.

**ABSTRACT**

Objectives: This study aims to construct an epidemiological profile with exposure of social and health care factors related to the permanence of high maternal mortality rates in the region. In favor of discussion in the academic community and directing public policies. Method: This is an epidemiological study of retrospective and quantitative character, based on the data collected in the DATASUS platform, through SIM, from 2009 to 2019, tabulating data in Excel in the form of tables. Result: Deaths prevailed in 2009 (10%), in Bahia (25%), in the brown race (66.37%), between 20 and 29 years (40.39%), in single women (48%), in the puerperium (48.52%), in the hospital environment (89.31%), because of direct obstetric causes (69.1%) and 23% by the ICD category O99. Conclusion: It is expected that the results of this study contribute to better targeting of public policies to reduce maternal deaths.
**DESCRIPTORS:** Women's health; Pregnancy; Epidemiology.

**RESUMEN**

Objetivos: Este estudio tiene como objetivo la construcción de un perfil epidemiológico con exposición de los factores sociales y de asistencia a la salud relacionada a la permanencia del alto índice de mortalidad materna en la región. En pro de la discusión en la comunidad académica y direccionamiento de políticas públicas. Método: Se trata de un estudio epidemiológico de carácter retrospectivo y cuantitativo, con base en los datos recogidos en la plataforma DATASUS, a través del SIM, de 2009 a 2019, tabulando datos en Excel en forma de tablas. Resultado: Los óbitos prevalecieron en 2009 (10%), en Bahía (25%), en la raza parda (66,37%), entre 20 a 29 años (40,39%), en mujeres solteras (48%), en el puerperio (48,52%), en ambiente hospitalario (89,31%), por causa obstétrica directa (69,1%) y 23% por la categoría CID O99. Conclusión: Se espera que los resultados de este estudio contribuyan para mejor direccionamiento de políticas públicas para reducir los óbitos maternos.
**DESCRIPTORES:** Ansiedad; Salud de la mujer; Gestación; Epidemiología.

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## INTRODUCTION

Maternal death is defined as death occurring in the gestational period or within 42 days of termination of pregnancy, from a cause related or aggravated by pregnancy, or by iatrogenic action.[1] It indicates women's access to health care and the ability of the health system to respond to their needs, so it is a violation of women's reproductive rights, which, in the majority, could be avoided through early and quality health care.[2]

Despite advances in medicine, reducing maternal mortality is still a challenge. Current statistics point to a reduction in maternal deaths of only 2.3% in the period from 1990 to 2015, varying by country, reflecting inequalities in health services in developed and developing countries[3], since the difficulty in accessing consultations, exams and medicines is an important factor regarding the quality of primary care and directly interferes with the prevention of avoidable deaths.[17]

Statistical data on maternal deaths are an indicator of the health of the female population, and consequently, are a parameter to help the management of public policies for this target audience. This theme is shown as a public health problem, especially in developing countries, such as Brazil, requiring further discussion about it, being part of the Millennium Development Goals (MDGs).[6]

In this way, this discussion is aligned with the National Patient Safety Program, in view of the influence of women's health care conditions and the need to act to reduce damage to the health of pregnant women[4], since quality prenatal care is essential in reducing maternal deaths and is configured as a right for every woman to have access to prenatal care, as well as assistance during childbirth and the puerperium.[18]

With this, the Brazilian Northeast region stands out as the second in the country with the highest number of maternal deaths, related to the low HDI (Human Development Index), reflecting the inequality resulting from the population's hyposufficiency.[5] Revealing the influence of social factors such as age, race, marital status and socioeconomic status.[6]

This study aims to build an epidemiological profile based on data available on the DATASUS platform, exposing the social and health care factors related to the persistence of the high maternal mortality rate in the region. Bearing in mind that by providing discussion among the academic community, it also contributes to better targeting public policies and reducing maternal mortality.

## METHODS

This is a retrospective and quantitative epidemiological study, based on data collected on the DATASUS platform, through the Brazilian Mortality Information System (SIM), for the period from 2009 to 2019.

As sources consulted for the theoretical basis, they were taken from online databases, such as SciELO and Google Scholar, in which the consolidated data are in the public domain. Due to this, the study did not require the approval of the Ethics and Research Committee (CEP) regarding resolution No. 510, of April 7th, 2016.

In the construction of the epidemiological profile, it was based on the place of residence through the filters: region; year of death; Federation unity; age group; color/race; marital status; type of obstetric cause; place of occurrence; period of pregnancy or puerperium and ICD-10 category.

After collecting the data, they were analyzed using absolute and relative numbers and proportion in the base of 100 and the results were presented through tables. The data obtained were tabulated in the Microsoft Excel program, in which descriptive and comparative statistical analysis of the information was performed, using tables and percentage calculations.

## RESULTS

In the period, 18,569 maternal deaths were observed, with the Southeast region standing out with 6,641 deaths (36%), followed by the Northeast region with 6,232 (34%). Then the North and South regions with 13% and in sequence, the Center-West with 8%.

The year 2009 stands out with 631 deaths (10%) and with a lower prevalence the year 2019, with 478 (8%). This period has a simple mean of 566.54 deaths and a standard deviation of 43.34.

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As for the FUs, the 3 states with the most cases were Bahia (25%), Maranhão (18%) and Ceará (15%). Sergipe has fewer cases (4%), followed by Alagoas and Rio Grande do Norte, both with 5% and Paraíba with 6%.

Table 1 describes maternal deaths according to age group, color/race and marital status. It was observed that the highest mortality rates are between 20 and 29 years with 40.39% deaths, followed by 30 to 39 years with 33.36% deaths. Between 50 and 59 years old has the lowest number of cases with 0.14%.

The brown race stands out for the highest frequency of cases with 66.37% of deaths, followed by whites with 16.56% of deaths. Analyzing marital status, single women predominate with 48%, followed by married women with 25%, but there is a high percentage of ignored cases (13%).

As for the obstetric cause, the direct obstetric one prevails, with 4305 (69.1%) cases, the minority being due to an unspecified obstetric cause (2.5%).

As shown in Table 2, most deaths occurred in a hospital environment, with 89.31% of cases, followed by death at home with 4.2%.

It is noteworthy that about half of the deaths occurred in the puerperium with 3024 (48.52%) cases, followed by death during pregnancy, childbirth or abortion with 31.74%.

Analyzing the causes of maternal death according to the ICD-10 categories, there is a prevalence of O99 (other maternal diseases, classified elsewhere, but which complicate pregnancy, childbirth and the puerperium) with 23% of deaths, followed by: eclampsia (12%), gestational hypertension with significant proteinuria (7%) and postpartum hemorrhage (6%), constituting the most prevalent causes.

## DISCUSSION

The Brazilian Northeast region is the second in number of maternal deaths, with 6,232 cases, preceded only by the Southeast region with 6,641 deaths. It is observed that despite the growth of the Brazilian

Table 1. Maternal deaths according to age group, color/race, education and marital status in the Brazilian northeast region from 2009 to 2019.

| Variables | Absolute value | % |
|---|---|---|
| Age Group | | |
| 10 - 14 | 83 | 1,33 |
| 15 - 19 | 850 | 13,64 |
| 20 - 29 | 2517 | 40,39 |
| 30 - 39 | 2266 | 36,36 |
| 40 - 49 | 506 | 8,12 |
| 50 - 59 | 9 | 0,14 |
| Ignored | 1 | 0,02 |
| | | |
| Color/race | | |
| White | 1032 | 16,56 |
| Black | 629 | 10,09 |
| Yellow | 15 | 0,24 |
| Brown | 4136 | 66,37 |
| Indigenous | 46 | 0,74 |
| Ignored | 374 | 6,00 |
| | | |
| Marital status | | |
| Single | 2993 | 48 |
| Married | 1550 | 25 |
| Widow | 36 | 0,57 |
| Divorced | 50 | 0,80 |
| Other | 816 | 13 |
| Ignored | 787 | 13 |

Source: DATASUS, 2021

Table 2 - Maternal deaths according to place of occurrence in the Brazilian northeast region from 2009 to 2019.

| Place of occurrence | Maternal deaths | (%) |
|---|---|---|
| Hospital | 5566 | 89,31 |
| Other health facility | 108 | 1,73 |
| Residence | 262 | 4,20 |
| Public facility | 118 | 1,89 |
| Others | 171 | 2,74 |
| Ignored | 7 | 0,11 |
| Total | 6232 | 100 |

Source: DATASUS, 2021.

and Northeastern HDI, there is still a large gap between the Northeast and the other regions of the country, relating to precariousness in education and hyposufficiency of the population and reflecting health conditions[5], favoring women of lower economic status to have higher mortality.[6] In addition, the region has the second highest population density in the country, with a population of around 53 million inhabitants.[7]

As for the FUs in the Northeast, Bahia stands out (25%) as the most populous state, with more than 14 million people.[8] In addition, there is a failure in the care provided to pregnant women and in family planning, combined with low schooling, since the shorter time of study is associated with less information about reproductive health and this is also reflected in the job market and income.[9]

With this, Rede Cegonha - a strategy of the Ministry of Health that aims to improve care during labor and birth - acts as a factor of intervention and humanization. This strategy is attributed to the slight reduction in mortality, with 2009 being the year with the most deaths (631) and 2019 with the fewest (478) maternal deaths. However, there are challenges in the implementation of Rede Cegonha, such as the qualification of work, institutional and subjective relationships and improved adherence.[10]

Maternal deaths in women of reproductive age, from 20 to 39 years of age, stand out due to the higher incidence of pregnancy in the period. Emphasizing the higher risk of obstetric complications in people over 36 years of age.[3] Furthermore, the mixed race prevails, corroborating the low socioeconomic status and limited access to health and the prevalence of this race in northeastern Brazil.[11]

There is a prevalence of single women (48%) in the cases, due to vulnerability due to the reduced support network during pregnancy and postpartum, from financial assistance to emotional, care and safety for the baby and the mother.[12]

As for the causal factors, maternal deaths are classified as: direct, indirect and un-

determined obstetrics. The first occurs due to obstetric complications (during pregnancy, childbirth or puerperium) due to omissions, inadequate interventions or incorrect treatment. The second stems from previous or acquired pathologies during pregnancy, intensified by the physiological changes of the period. And the third refers to accidental deaths and/or from various causes during pregnancy. Therefore, despite the advances, there are still flaws in the

> **Despite advances in medicine, reducing maternal mortality is still a challenge. Current statistics point to a reduction in maternal deaths of only 2.3% in the period from 1990 to 2015**

care of pregnant women, such as difficulty in accessing health care, lack of training of the multidisciplinary team and failure to adhere to prenatal care.[3]

As for the ICD-10 category, the O99 category stands out in the Northeast region: other maternal diseases, classified elsewhere, but which complicate pregnancy, childbirth and the puerperium (23%). In

second place, eclampsia (12%) is the most severe form of hypertensive disorder, which can lead to death due to cerebral hemorrhage and acute pulmonary edema, and prenatal care is responsible for reducing cases.[13] Gestational hypertension with significant proteinuria (7%) also stands out, similar to the most frequent causes of maternal death in Brazil: hypertension, hemorrhage, puerperal infection and abortion.[2]

Predominance of deaths in the hospital environment and in the puerperium, therefore, the importance of the quality of health services is emphasized, with timely care and qualification of the obstetric emergency team. However, the concentration of services specialized in high obstetric complexity in the most populous cities in the region and the inequality in the distribution of resources makes it difficult to address emergencies in a timely manner and directly impacts deaths.[14] Along with assistance to postpartum women in an attempt to reduce avoidable deaths, exemplified by the home visit carried out by primary care.[11]

It is noticed that the underreporting of deaths still limits studies and masks the causes of maternal death in northeastern Brazil. In view of this, the Maternal Death Committees were created - inter-institutional bodies, of an educational nature, confidential action and multidisciplinary participation - that investigate maternal deaths, preventable deaths such as sentinel events, risk factors and evaluate the quality of maternal health care, in order to carry out public policies and intervention actions to reduce these cases.[15]

Thus, it is crucial to delimit the levels of mortality in each region, as well as to reduce underreporting, in order to recognize its determinants to direct social actions. Thus, it appears that many deaths are preventable through quality prenatal care, aimed at: primary prevention, access to treatments, surveillance and active search for risk cases. With this, it will be possible to carry out family planning, monitoring, early diagnosis and effective treatment.[16]

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## CONCLUSION

When evaluating the epidemiological profile of maternal mortality in the northeast region of Brazil, it was found a predominance of women between 20 and 29 years old, brown, single, during the puerperium, due to direct obstetric causes, in a hospital environment, with the highest number of cases in 2009, constant since 2015 – a reflection of the adhesion to the Rede Cegonha, of the Ministry of Health. In addition, compared to other regions of the country, the Northeast is the second largest in number of maternal deaths, with emphasis on Bahia, Maranhão and Ceará for having the highest rates. Thus, the influence of socioeconomic and educational factors on the region's numbers is notorious.

In addition, maternal mortality is mainly due to the triad: hypertensive syndromes, hemorrhages and infections - most of these diagnoses being possible early with quality prenatal care.

Therefore, the importance of this study for the analysis of the theme is highlighted, considering the scope and repercussion of maternal death in the northeast region of Brazil and, from this, it is evident the need for greater investments in reproductive education, family planning, professional qualification and decentralization of maternity hospitals specialized in medium and high complexity, aimed at diagnoses and, consequently, early and safe treatments, in order to reduce maternal mortality rates.

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