

# Epidemiological profile of maternal deaths due to anesthetic complications: study based on DataSUS.

## Perfil epidemiológico dos óbitos maternos por complicações anestésicas: estudo baseado no DataSUS.

# Epidemiological profile of maternal deaths due to anesthetic complications: study based on DataSUS.

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# REVISA

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### RESUMO

**Objetivo:** A anestesia obstétrica é essencial para segurança no parto, sendo indicador da qualidade assistencial. Técnicas neuroaxiais predominam por eficácia e baixo risco, mas complicações ainda ocorrem em cenários de infraestrutura limitada. Este estudo descritivo analisou óbitos por complicações anestésicas durante o parto no Brasil, entre 2003 e 2023, com dados do DATASUS. Foram registrados 196 óbitos, com maior incidência na região Nordeste (30,1%), seguida pelas regiões Sul (22,9%) e Sudeste (18,8%). A maioria das mortes ocorreu em ambiente hospitalar (95,4%), com predominância na faixa etária de 20 a 29 anos (51,02%), contrastando com estudos que apontam maior risco em adolescentes ou mulheres acima de 35 anos. Além disso, 48,5% das mulheres eram solteiras, evidenciando possíveis vulnerabilidades sociais e menor acesso a cuidados adequados. Os dados revelam desigualdades regionais e estruturais na assistência obstétrica brasileira. Conclui-se que o fortalecimento da infraestrutura hospitalar, a capacitação das equipes multiprofissionais e a formulação de políticas públicas específicas são essenciais para reduzir a mortalidade materna evitável. A análise de fatores epidemiológicos é crucial para embasar estratégias de prevenção e qualificar a anestesia obstétrica no Brasil, promovendo maior equidade e segurança na atenção ao parto.

**Palavras-chave:** Anestesia Obstétrica; Complicações Intraoperatórias; Mortalidade Materna.

### ABSTRACT

**Objective:** Obstetric anesthesia is essential for safety during childbirth and serves as an indicator of healthcare quality. Neuraxial techniques are preferred due to their effectiveness and lower risk, although complications still occur in settings with limited infrastructure and inadequate monitoring. This descriptive study analyzed deaths from anesthetic complications during childbirth in Brazil between 2003 and 2023, using DATASUS data. A total of 196 deaths were recorded, with the highest incidence in the Northeast region (30.1%), followed by the South (22.9%) and Southeast (18.8%). Most deaths occurred in hospital settings (95.4%), predominantly among women aged 20 to 29 years (51.02%), contrasting with studies that report higher risks in adolescents or women over 35 years. Additionally, 48.5% of the women were single, highlighting possible social vulnerabilities and reduced access to adequate care. The data reveal regional and structural inequalities in obstetric care in Brazil. Strengthening hospital infrastructure, training multidisciplinary teams, and implementing targeted public policies are essential to reduce preventable maternal mortality. The analysis of epidemiological factors is crucial to support prevention strategies and to improve the quality of obstetric anesthesia in Brazil, thereby promoting greater equity and safety in childbirth care.

**Keywords:** Anesthesia Obstetrical; Intraoperative Complications; Maternal Mortality

### RESUMEN

**Objetivo:** La anestesia obstétrica es esencial para la seguridad durante el parto y constituye un indicador de la calidad asistencial. Las técnicas neuroaxiales predominan por su eficacia y menor riesgo, aunque aún se presentan complicaciones en contextos con infraestructura limitada y monitorización insuficiente. Este estudio descriptivo analizó las muertes por complicaciones anestésicas durante el parto en Brasil, entre 2003 y 2023, utilizando datos del DATASUS. Se registraron 196 muertes, con mayor incidencia en la región Nordeste (30,1%), seguida por el Sur (22,9%) y el Sudeste (18,8%). La mayoría de los decesos ocurrió en hospitales (95,4%), principalmente en mujeres de 20 a 29 años (51,02%), en contraste con estudios que señalan mayor riesgo en adolescentes o mujeres mayores de 35 años. Además, el 48,5% de las mujeres eran solteras, lo que refleja posibles vulnerabilidades sociales y menor acceso a cuidados adecuados. Los datos revelan desigualdades regionales y estructurales en la atención obstétrica en Brasil. Se concluye que el fortalecimiento de la infraestructura hospitalaria, la capacitación de los equipos multidisciplinarios y la formulación de políticas públicas específicas son esenciales para reducir la mortalidad materna evitable. El análisis de factores epidemiológicos es fundamental para sustentar estrategias de prevención y mejorar la anestesia obstétrica en Brasil, promoviendo mayor equidad y seguridad en la atención al parto.

**Descriptores:** Anestesia Obstétrica; Complicaciones Intraoperatorias; Mortalidad Materna

ORIGINAL

## Introduction

Obstetric anesthesia plays an essential role in promoting maternal safety and comfort during both vaginal and surgical delivery, and is an indicator of the quality of maternal health care.<sup>1</sup> The choice of technique should take into account the pregnant woman's clinical condition, the type of delivery, and the experience of the medical team.<sup>2</sup>

Neuroaxial techniques (spinal anesthesia, epidural anesthesia, and combined spinal-epidural anesthesia) are widely recognized as safer and more effective, as they offer predictable sensory blockade, rapid recovery, and a lower risk of serious complications compared to general anesthesia.<sup>1</sup> In addition to improving maternal-fetal outcomes, they reduce maternal morbidity and mortality and are recommended by national and international guidelines as the first option in obstetric practice.<sup>1,2</sup>

Despite safety measures, anesthetic complications can still occur and, in certain situations, result in death. These complications may be associated with monitoring failures, equipment limitations, or a shortage of professionals<sup>3,4</sup>. Hypotension, failed nerve blocks, post-dural puncture headache, hematomas, and infections of the neuroaxial space are among the most common causes<sup>3</sup>. Furthermore, pregnant women with hypertension, obesity, and heart disease, as well as those undergoing emergency cesarean sections with general anesthesia, are more vulnerable<sup>4</sup>.

The study of the epidemiological profile of deaths due to anesthetic complications is essential to understand their magnitude and support preventive measures. DATASUS allows the identification of regional disparities and associated factors, guiding clinical protocols and public policies. This analysis supports the improvement of obstetric and anesthetic care, contributing to reducing preventable maternal mortality and improving childbirth safety in Brazil<sup>5,6</sup>. Therefore, the objective of this study was to describe deaths that occurred due to anesthetic complications during childbirth in Brazil by region, age group, marital status, and place of occurrence, considering the study period from 2003 to 2023.

## Method

This is a descriptive epidemiological study in which data were obtained by consulting the TABNET system databases, provided by DATASUS, accessed on August 5, 6, and 10, 2025.

The study population consisted of deaths that occurred due to anesthetic complications during childbirth, categorized by region of Brazil, age group, marital status, and location of occurrence, considering the study period from 2003 to 2023. The data were collected through tables organized in Excel and subsequently transferred to a Microsoft Word file.

## Results

Table 1 shows the data regarding the total number of deaths that occurred due to anesthetic complications during childbirth in Brazil from 2003 to 2023, according to the regions of the country, totaling 196 cases. The Northeast region had the highest number of cases with 30.1%, followed by the South (22.9%), Southeast (18.8%), North (17.8%), and Central-West (10.2%) regions.

**Table 1** – Deaths due to anesthetic complications during childbirth in the regions of Brazil from 2003 to 2013

REGION	N	%
NORTH	35	17,8%
NORTHEAST	59	30,1%
SOUTHEAST	37	18,8%
SOUTH	45	22,9%
CENTRAL-WEST	20	10,2%
TOTAL	196	100%

Source: MS/SVS/CGIAE – Mortality Information System – SIM

Table 2 shows that, regarding the location of occurrence during the same period in Brazil, the hospital was the location with the highest number of deaths (187), followed by other health establishments (5), other locations (3), and home (1).

**Table II** – Locations where deaths occurred due to anesthetic complications during childbirth in Brazil from 2003 to 2013.

PLACE OF OCCURRENCE	N	%
Hospital	187	100%
Other health facility	5	2,55%
Domicile	1	0,5%
Others	3	1,5%
TOTAL	196	100%

Source: MS/SVS/CGIAE – Mortality Information System – SIM

Table 3 shows the deaths by age group in the following intervals: 10-14 years; 15-19 years; 20-29 years; 30-39 years and 40-49 years. Cases between 20 and 29 years represented the largest number, with 51.02% of the cases in the period, followed by those aged 30 to 39 years (24.48%), 15 to 19 years (20.40%), and finally, 10 to 14 years (3.06%).

**Tabela III** – Deaths due to anesthetic complications in relation to age group in Brazil from 2003 to 2013

AGE GROUP	N	%
10 - 14 years old	6	3,06%
15 - 19 years old	40	20,40%
20 - 29 years old	100	51,02%
30 - 39 years old	48	24,48%
40 - 49 years old	2	1,02%
TOTAL	196	100%

Source: MS/SVS/CGIAE – Mortality Information System – SIM

Regarding marital status, the highest number of deaths was concentrated in the single category, with 95 cases during the period, followed by those classified as "other" (33), "unknown" (8), and "other" (33) (Table 4).

**Tabela IV - Deaths due to anesthetic complications in relation to marital status in Brazil from 2003 to 2013**

MARITAL STATUS	N	%
Single	95	100%
Married	58	
Legally separated	2	
Other	33	
Ignored Answer	8	
TOTAL		

Source: MS/SVS/CGIAE - Mortality Information System - SIM

## Discussion

The study in question consulted the DATASUS information source, as it is easily accessible, fast, and efficient for obtaining data on deaths in Brazil that occurred due to anesthetic complications during childbirth in the period from 2003 to 2023. Regarding the regions of Brazil, the data referring to the total number of deaths that occurred due to anesthetic complications during childbirth in the period from 2003 to 2023 showed a predominance in the Northeast region with 30.1%. In accordance with this finding, studies show that the region with the highest incidence of anesthetic complications during childbirth is the Northeast <sup>11, 12</sup>. The concentration of maternal deaths in these regions reflects poor quality and inadequate hospital infrastructure, and deficient access to healthcare services. In addition to the factors mentioned above, it is necessary to highlight that the high rate of cesarean sections performed without proper indication contributes to the perpetuation of this situation <sup>13</sup>.

Regarding the location of occurrence during the same period in Brazil, the hospital was the place with the highest number of deaths (187), followed by other health establishments (5), other locations (3), and home (1). Similarly, studies confirm that most maternal deaths related to anesthetic complications occur in a hospital setting, especially during cesarean sections, due to the greater need for interventions in these procedures <sup>7, 8</sup>. Despite hospitals offering specialized support and advanced resources, studies show that factors such as overloaded services and the urgency of childbirth can compromise anesthetic safety<sup>9,10</sup>.

Regarding deaths by age, cases among those aged 20 to 29 years represented the largest number, accounting for 51.02% of cases during the period, followed by those aged 30 to 39 years (24.48%), 15 to 19 years (20.40%), and finally, 10 to 14 years (3.06%). However, the literature shows that anesthetic complications during childbirth affect women over 35 years of age more frequently, since they have a higher prevalence of comorbidities that make the procedure riskier, the most common being diabetes and hypertension <sup>11, 12</sup>. Furthermore, the rate of cesarean sections performed without proper indication is higher from that age onwards <sup>13</sup>. Other studies indicate a peak in the curve of the incidence of deaths related to anesthetic complications during childbirth in adolescent pregnant women, and we can highlight as reasons the greater social vulnerability, access to lower quality care, and above all, physiological immaturity <sup>15-18</sup>.

The number of deaths by marital status was concentrated in the single category, with 95 cases during the period, followed by those classified as "other" (33), "unknown" (8), and "other" (33). Although there is no specific data on anesthesia and marital status, studies on overall maternal mortality (due to obstetric causes) agree with the data found: that unmarried women

(including single, divorced, and widowed) have a higher risk of obstetric death than married women or those in a stable union <sup>17,18</sup>. This may be related to reduced access to or quality of prenatal care, less social and emotional support, and socioeconomic and cultural factors. <sup>18</sup>.

## **Final Considerations**

The analyzed data demonstrate that anesthetic complications during childbirth represent a significant cause of maternal mortality, especially in regions with less developed hospital infrastructure, such as the Northeast of Brazil. The higher concentration of deaths in hospital settings, particularly during cesarean sections, highlights the importance of investments in professional training and adequate conditions for the safe performance of these procedures. The most affected age group, between 20 and 29 years old, reveals a paradox between population data and clinical evidence, which suggests a higher risk in older or adolescent pregnant women, pointing to the importance of a more in-depth look at individual risk factors. Furthermore, the higher incidence of deaths among single women suggests that social factors and access to healthcare directly influence the quality of prenatal and peripartum care.

This study reinforces the importance of considering epidemiological aspects, such as age, marital status, location of occurrence, and region of residence, in formulating public policies aimed at reducing maternal mortality, as well as improving anesthetic and obstetric protocols in hospitals.

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