Maternal Mortality in the Central-West Region of Brazil: Analysis of Official Datasus Indicators

Mortalidade Materna no Centro-Oeste do Brasil: Análise dos Indicadores Oficiais do DatasusMortalidad Materna en la Región Centro-Oeste de Brasil: Análisis de los Indicadores Oficiales del Datasus

RESUMO

Objetivo: analisar o panorama da mortalidade materna (MM) na Região Centro-Oeste do Brasil no período de 2019 a 2023. **Método:** trata-se de um estudo observacional, transversal e descritivo com abordagem quantitativa e utilização de dados secundários de domínio público obtidos no Departamento de Informática do Sistema Único de Saúde (DATASUS), do Ministério da Saúde (MS), a partir do Sistema de Informação de Mortalidade Materna (SIM). **Resultados:** foram registrados 868 óbitos maternos. O estado de Goiás apresentou o maior número de casos (45,27%), seguido por Mato Grosso (27,64%), Mato Grosso do Sul (16,47%) e Distrito Federal (10,60%). O ano de 2021 concentrou 36,4% das mortes, configurou-se como o período mais crítico e refletiu diretamente o impacto da pandemia, seguido por declínio nos anos subsequentes. **Considerações finais:** a partir desses dados, se conclui que é importante desenvolver políticas públicas para este perfil populacional com a intenção de minimizar essa taxa.

DESCRITORES: Mortalidade materna; Perfil de saúde; Qualidade da assistência à saúde; Saúde da mulher.

ABSTRACT

Objective: to analyze the panorama of maternal mortality (MM) in the Midwest Region of Brazil from 2019 to 2023. **Method:** This is an observational, cross-sectional, descriptive study with a quantitative approach using secondary data in the public domain obtained from the Department of Informatics of the Unified Health System (DATASUS) of the Ministry of Health (MS) from the Maternal Mortality Information System (SIM). **Results:** 868 maternal deaths were recorded. The state of Goiás had the highest number of cases (45.27%), followed by Mato Grosso (27.64%), Mato Grosso do Sul (16.47%), and the Federal District (10.60%). The year 2021 accounted for 36.4% of deaths, representing the most critical period and directly reflecting the impact of the pandemic, followed by a decline in subsequent years. **Final considerations:** based on these data, it is concluded that it is important to develop public policies for this population profile with the intention of minimizing this rate.

DESCRIPTORS: Maternal mortality; Health profile; Quality of health care; Women's health.

RESUMEN

Objetivo: analizar el panorama de la mortalidad materna (MM) en la región centro-oeste de Brasil en el período comprendido entre 2019 y 2023. **Método:** se trata de un estudio observacional, transversal y descriptivo con un enfoque cuantitativo y el uso de datos secundarios de dominio público obtenidos en el Departamento de Informática del Sistema Único de Salud (DATASUS) del Ministerio de Salud (MS), a partir del Sistema de Información de Mortalidad Materna (SIM). **Resultados:** se registraron 868 muertes maternas. El estado de Goiás presentó el mayor número de casos (45,27 %), seguido de Mato Grosso (27,64 %), Mato Grosso do Sul (16,47 %) y el Distrito Federal (10,60 %). El año 2021 concentró el 36,4 % de las muertes, lo que lo convirtió en el período más crítico y reflejó directamente el impacto de la pandemia, seguido de un descenso en los años siguientes. **Consideraciones finales:** a partir de estos datos, se concluye que es importante desarrollar políticas públicas para este perfil poblacional con la intención de minimizar esta tasa.

DESCRIPTORES: Mortalidad materna; Perfil de salud; Calidad de la asistencia sanitaria; Salud de la mujer

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Received: 11/14/2025
Approved: 12/01/2025

DOI: https://doi.org/10.36489/nursing.2025v30i331p12464-12484

INTRODUCTION

In low-income and developing countries, maternal mortality (MM) rates are concerning and reflect inequalities in access to health services and measures[1].

The International Classification of Diseases (ICD-10) refers to MM as the death of a woman during pregnancy, childbirth, or up to 42 days after childbirth, caused by any factor related to or intensified by pregnancy or by actions implemented in relation to it, thus ruling out accidental or incidental causes[2,3].

It is one of the most sensitive indicators of public health, directly reflecting the quality of obstetric care, timely access to services, and the system's ability to prevent, identify, and manage maternal complications[4].

According to the Manual of Maternal Death Committees of the Brazilian Ministry of Health[5], MM is divided into direct obstetric causes, resulting from complications in pregnancy, childbirth, or the postpartum period, associated with interventions, omissions, or inadequate management (such as postpartum hemorrhage and eclampsia, both preventable with early diagnosis and appropriate care) and indirect causes, resulting from preexisting or acquired diseases in the pregnancy-puerperal cycle (e.g., heart disease or diabetes), not directly caused by obstetric processes but aggravated by pregnancy.

In Brazil, direct causes predominate, strongly correlated with insufficient prenatal care coverage and quality, geographical barriers to access, scarcity of human and technological resources, and delays in responding to obstetric emergencies[6] .

In Brazil, the maternal mortality ratio (MMR), which indicates the number of deaths related to pregnancy, childbirth, and the postpartum period per 100,000 live births, has varied significantly in recent years[7].

The target of Sustainable Development Goal (SDG) 3.1, which sets out to reduce the global MMR to 70 deaths per 100,000 live births by 2030[8]. In Brazil, the commitment is to reduce this figure to 30 deaths per 100,000 by 2030[9].

The data presented in this study are available from the Department of Information and Informatics of the Unified Health System (DATASUS), whose mission is to promote the accessibility, integration, and security of health information, strengthening the efficiency and management of the Unified Health System (SUS) through technological solutions[10].

Among its tools, TabNet stands out, allowing online tabulation of official data from systems such as the Mortality Information System (SIM), the Live Birth Information System (SINASC), among others[11].

In nursing, the use of DATASUS/TabNet in retrospective epidemiological studies on MM makes it possible to identify patterns and risk factors, evaluate public policies, and detect gaps in care, supporting strategies for improving maternal care.

In this context, understanding the regional landscape of maternal mortality is essential to support public policies and guide prevention strategies appropriate to the socioeconomic, cultural, and structural characteristics of each territory.

Detailed analysis by region allows for the identification of predominant risk factors, gaps in care, and priority areas for intervention, favoring the implementation of more effective actions aligned with both the needs of the population and the global goals proposed by the WHO and the SDGs.

In this sense, this article aims to describe the overview of MM in the Midwest Region of Brazil from 2019 to 2023.

METHOD

This is an observational, cross-sectional, descriptive study with a quantitative approach using secondary data in the public domain obtained from DATASUS, of the Ministry of Health, from the SIM, which gathers official information on morbidity and mortality and health indicators in Brazil[12] .

Population and study location

The data for this study were sampled from the Midwest region of Brazil. Network structure data were obtained from the National Registry of Health Establishments (CNES), including data from SUS and non-SUS establishments[13]. The time frame covered the years 2019 to 2023.

The Central-West region of Brazil comprises the states of Goiás (GO), Mato Grosso (MT), Mato Grosso do Sul (MS), and the Federal District (DF). It is the second largest region in the country in terms of land area, according to data from the Brazilian Institute of Geography and Statistics (IBGE), covering approximately 1.6 million square kilometers, corresponding to about 19% of the national territory[14].

Its population is estimated at 16,297,074 inhabitants, resulting in a population density of 11.98 inhabitants per square kilometer. The average Human Development Index (HDI) is 0.753, which indicates a high level of development compared to other Brazilian regions.

Data collection

Information was collected in August and September 2025.

Inclusion and exclusion criteria

All maternal deaths recorded in the SIM, available at DATASUS / TabNet, that occurred between 2019 and 2023 in the Midwest Region of Brazil were included in the study. Direct and

DOI: https://doi.org/10.36489/nursing.2025v30i331p12464-12484

indirect deaths were considered, classified according to the 10th revision of the ICD-10, in Chapter XV (O00–O99)[15] .

Records unrelated to pregnancy, with inconsistencies in essential variables, as well as cases outside the defined period and women not residing in the studied region, were excluded. This selection sought to ensure the reliability and consistency of the data, ensuring an accurate epidemiological analysis of maternal mortality in the Midwest.

Variables

The following variables of interest were considered: year of death, federal unit, ICD-10 chapter, age group, color/race, education, and marital status. Based on these variables, it was possible to describe the epidemiological profile of maternal mortality in the studied region, allowing the identification of trends and patterns that support the understanding of the phenomenon and its relationship with sociodemographic and clinical factors.

Data analysis methodologies

The collected data were processed and systematized by creating tables and graphs using Microsoft Word (version 2023) and *Microsoft Office Excel®* software. In addition, the Python application was used as a support tool for organizing, tabulating, and statistically analyzing the information.

The methodological approach adopted was based on descriptive statistics, considering absolute and relative frequencies as parameters for characterizing the variables studied and interpreting the results, supporting the discussion and understanding of the patterns observed.

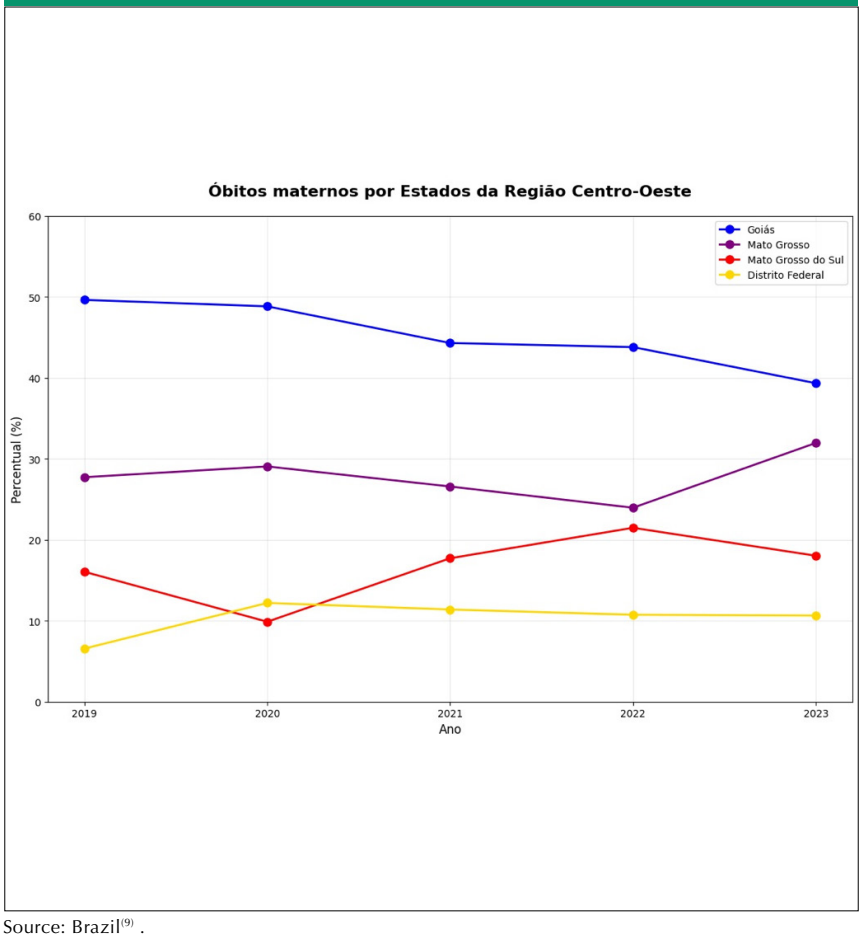
Ethical considerations

The data used in this study come from an official government platform, in the public domain and without individual identification of participants. Thus, as established by Resolution No. 466/2012 of the National Health Council (CNS), the research does not require review by a Research Ethics Committee (CEP), since it does not directly involve identifiable human beings[16] .

RESULTS

Graph 1 shows maternal deaths by state in the Midwest Region from 2019 to 2023. There were 868 cases in the five-year period. The highest number of deaths was reported in the state of Goiás (45.27%), followed by Mato Grosso (27.64%). The highest number of maternal deaths occurred in 2021, with 316 records (36.4% of notifications), followed by 2020, with 172 cases (19.8%), showing a reduction in subsequent years.

Graph 1 - Maternal deaths by state in the Midwest Region from 2019 to 2023



Source: Brazil[9] .

Most deaths occurred among women aged 30 to 39 (45.6%) and 20 to 29 (36.3%). Brown-skinned women predominated (57%), followed by white women (32.1%) and black women (9.5%). In terms of education, the group with 8 to 11 years of schooling stood out (50.8%), and in terms of marital status, single women (44.7%) and married women (33%) prevailed (Table 1).

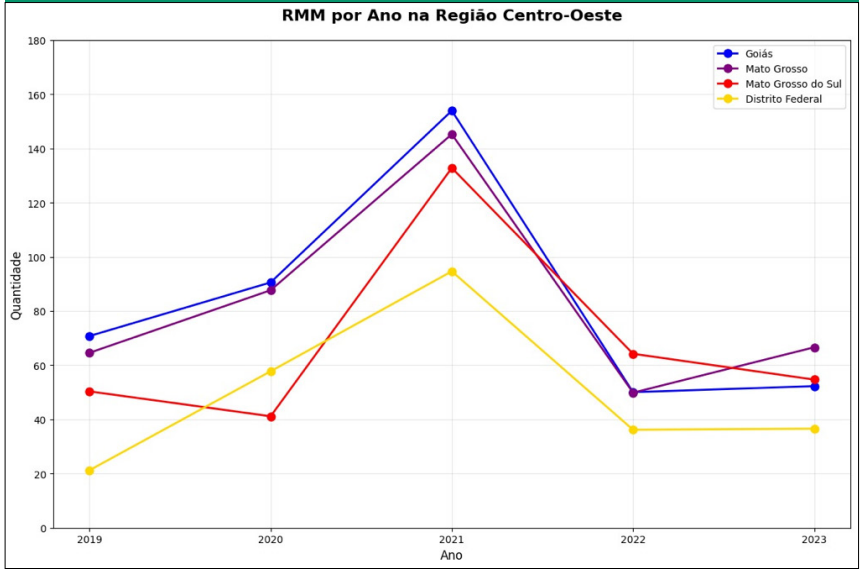
DOI: https://doi.org/10.36489/nursing.2025v30i331p12464-12484

Table 1 - Maternal deaths according to age group, color/race, education, and marital status from 2019 to 2023 in the Midwest Region

	Variables	Total	%
Age group	10 to 14	4	0.5
	15 to 19	66	7.8
	20 to 29 years old	307	36.3
	30 to 39 years old	386	45.6
	40 to 49 years old	80	9.5
	50 to 59	3	0.4
Color/race	White	269	32.1
	Brown	478	57
	Black	80	9.5
	Yellow	1	0.1
	Ignored	11	1.3
Education	None	13	1.5
	1 to 3 years	38	4.4
	4 to 7 years	114	13.3
	8 to 11 years	436	50.8
	12 years or older	192	22.4
	Unknown	66	7.7
Marital status	Single	385	44.7
	Married	284	33
	Legally separated	23	2.7
	Other	123	14.3
	Ignored	46	5.3

Source: Brazil[9].

Graph 2 - RMM per year in the Midwest Region from 2019 to 2023



Source: Brazil(9).

Between 2019 and 2023, Goiás showed significant variations in maternal mortality, reflecting the impacts of the COVID-19 pandemic on care for pregnant women. In 2019, there were 68 deaths (MMR of 70.75), rising to 84 in 2020 (MMR of 90.54) and peaking in 2021 with 140 deaths (MMR of 153.91). Subsequently, there was a drop to 53 deaths in 2022 (MRM of 59.05) and 48 in 2023 (MRM of 52.27), indicating a downward trend after the critical period.

In Mato Grosso, fluctuations were also observed. There were 38 deaths in 2019 (MMR of 64.56), 50 in 2020 (MMR of 87.66), and 84 in 2021 (MMR of 145.22). This was followed by a drop to 29 in 2022 (RMM of 49.85) and a slight increase in 2023, with 39 deaths (RMM of 66.6). In Mato Grosso do Sul, there were 22 deaths in 2019 (RMM of 50.34) and 17 in 2020 (RMM of 41.15). The peak occurred in 2021, with 56 deaths (MMR of 132.78), followed by a reduction to 26 in 2022 (MMR of 64.22) and 22 in 2023 (MMR of 54.68). In the Federal District, the MMR also fluctuated: 9 deaths in 2019 (MMR of 21.21), 21 in 2020 (MMR of 57.75), and 36 in 2021 (MMR of 94.64). In 2022 and 2023, it remained stable, with 13 deaths (RMM of about 36).

DISCUSSION

In the Midwest Region, the number of maternal deaths peaked in 2021. The results show that the epidemiological context had a significant impact on maternal health by intensifying pre-existing vulnerabilities in obstetric and neonatal services.

Among the vulnerabilities highlighted during the pandemic are: a reduction in prenatal consultations, less involvement of partners, an increase in cesarean sections, and greater inequalities in access to care, especially among black, brown, Asian, and in-

DOI: https://doi.org/10.36489/nursing.2025v30i331p12464-12484

digenous women[17] .

National studies indicate that the shortage of obstetric beds and the collapse of hospitals aggravated the situation, increasing maternal mortality, associated with the overload of services, limited consultations and exams, and complications resulting from SARS-CoV-2 infection[18] .

After the peak in 2021, there was a reduction in deaths, totaling 121 records in 2022 and 122 records in 2023. This decline possibly reflects the lesser impact of the pandemic, the progress of vaccination, and the reorganization of the healthcare network[12]). However, underreporting remains a significant obstacle, resulting from ignorance about the mandatory nature of registration, structural failures, fear of sanctions, and the prioritization of more serious cases[6]).

The sociodemographic and epidemiological profile of women who died from maternal causes highlights social, educational, and racial inequalities associated with the risk of death. These inequalities reflect the interaction between social determinants, reproductive factors, and structural inequalities, which underpin preventable maternal mortality in the country[19]). Understanding these factors is essential to support public policies based on equity and the humanization of obstetric care.

The concentration of deaths among women aged 30 to 39 and 20 to 29 reveals increased vulnerability during the period of highest fertility, marked by family and work responsibilities and the presence of comorbidities that increase gestational risk[20]). This finding converges with national studies that point to this age group as the most affected by maternal mortality[12]).

The high proportion of brown (57%) and black (9.5%) women reveals the impact of structural and institutional racism on obstetric care (Costa, 2023). Black women face barriers to access, lower quality of care, and dehumanizing practices, resulting in worse maternal outcomes[19]). Color/race is an important social marker of health inequity[20]).

MM reflects not only clinical causes but also social and structural conditions that increase health risks. In this sense, social class, gender, and race determine access to care and explain the greater vulnerability of certain women to gestational complications[19]).

In addition, the distance from services and the precarious infrastructure in remote areas hinder timely care and increase the risk of death[19] . Thus, maternal death reflects social and political inequalities present in the health system[20] .

The predominance of women with 8 to 11 years of schooling (50.8%) indicates that vulnerability goes beyond low educational levels, reflecting persistent structural inequalities. This finding demonstrates that, even with access to basic knowledge, this group remains exposed to greater risks during pregnancy, childbirth, and the postpartum period.

Education influences the recognition of risk signs, access to services, and understanding of guidelines in the NP[19,20]). Studies indicate that this educational profile may be associated with difficulties in understanding obstetric risks, limited use of the guidance provided in health services, and communication barriers between professionals and patients[21]).

Increasing educational attainment alone does not reduce MM rates. It is essential to integrate investment in education with effective public health policies, with equitable access to quality services, training of multidisciplinary teams, accessible communication, and continuous monitoring of pregnant women and new mothers. Only the articulation of these dimensions can consistently reduce maternal deaths and promote equity in women's care[22(2)]).

The higher proportion of unmarried women (44.7%) suggests less social support and absence of a partner, factors that reduce adherence to the PN and the ability to cope with complications[7]). These findings reinforce the need for intersectoral actions focused on social support, reproductive planning, and comprehensive care for women.

The lack of encouragement for self-care by partners and families increases maternal risk. Thus, the importance of family and community support networks and the socioeconomic context in reducing inequalities related to maternal mortality is emphasized.

The concentration of deaths in Goiás and Mato Grosso, mainly during the COVID-19 pandemic, reveals regional inequalities in the coverage and quality of obstetric care. The shortage of beds in maternal intensive care units (ICUs), insufficient transportation in remote areas, and the unequal distribution of professionals highlight historical disparities that compromise maternal care in the Midwest[23] .

In the following years, there was a reduction in deaths, reflecting vaccination and the resumption of services[24]). Even so, maternal mortality in the Midwest remains above the UN/WHO target—less than 70 deaths per 100,000 live births by 2030. Goiás (393) and Mato Grosso (240) recorded the highest numbers, while the Federal District (92) performed best, associated with a unified administrative structure and greater investment in health.

Despite constitutional advances that guarantee health as a right, barriers to access persist that penalize black and poor women. Health inequalities are historical, structural, and transformable[1]). Addressing

DOI: https://doi.org/10.36489/nursing.2025v30i331p12464-12484

MMR requires combating social, racial, and territorial inequalities that sustain inequities in care and prevent the achievement of SDG 3 targets.

FINAL CONSIDERATIONS

MM in the Midwest Region (2019–2023) highlights inequalities in access to and quality of obstetric care. The direct causes, most of which are preventable, remain the main causes of death, reflecting weaknesses in prenatal care and health services.

The increase in rates during the COVID-19 pandemic reinforced structural limitations and the need to strengthen the women's care network. Although there have been advances, the Maternal Mortality Ratio still exceeds WHO and SDG targets. Reducing these rates requires integrated public policies, expanded access, professional training, and improved services, ensuring comprehensive and equitable care for pregnant women.

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DOI: https://doi.org/10.36489/nursing.2025v30i331p12464-12484