Maternal Mortality and Death Surveillance in the Pregnancy–Puerperal Cycle: An Observational Study in the Piracicaba Health Region, São Paulo, 2017–2022

Mortalidade Materna e Vigilância do Óbito no Ciclo Gravídico-Puerperal: Estudo Observacional na Região de Saúde de Piracicaba, São Paulo, 2017–2022

Mortalidad Materna y Vigilancia de ça Muerte en el Ciclo Embarazo-Puerperio: Estudio Observacional en la Región de Salud de Piracicaba, São Paulo, 2017–2022

RESUMO

Objetivo: Avaliar a mortalidade materna na Região de Saúde de Piracicaba (RRAS-14) entre 2017 e 2022, analisando características e fatores associados para melhorar a assistência materna. **Métodos**: Estudo observacional com base em 3.019 óbitos de mulheres em idade fértil, sendo 90 durante o ciclo gravídico-puerperal. Dados foram coletados do Sistema de Informação de Mortalidade (SIM) e comitês de vigilância. **Resultados:** A maioria das mortes ocorreu no puerpério (53,3%), em mulheres de 15 a 49 anos, brancas (65,6%) e com ensino médio (43,03%). Causas indiretas prevaleceram (54,4%), e a mortalidade materna foi a décima principal causa de morte na região. A análise de óbitos variou de 45,5% em 2018 para 50,0% em 2019. **Conclusão:** A mortalidade materna permanece, em grande parte, evitável. O fortalecimento do pré-natal, parto e puerpério, aliado à qualificação de investigações, é essencial para reduzir desigualdades e melhorar a assistência materna.

DESCRITORES: Mortalidade Materna; Monitoramento Epidemiológico; Atenção Primária à Saúde; Enfermagem; Cuidado Pré-Natal.

ABSTRACT

Objective: To evaluate maternal mortality in the Piracicaba Health Region (RRAS-14) between 2017 and 2022, analyzing characteristics and associated factors to improve maternal care. **Method:** Observational study based on 3,019 deaths of women of reproductive age, including 90 deaths during the pregnancy-puerperal cycle. Data were collected from the Mortality Information System (SIM) and surveillance committees. **Results:** Most deaths occurred during the puerperium (53.3%), in women aged 15 to 49 years, predominantly white (65.6%), and with secondary education (43.03%). Indirect causes prevailed (54.4%), and maternal mortality was the tenth leading cause of death in the region. Death investigations ranged from 45.5% in 2018 to 50.0% in 2019. **Conclusions:** Maternal mortality remains largely preventable. Strengthening prenatal, childbirth, and postpartum care, combined with enhanced death investigations, is essential to reduce inequalities and improve maternal care.

DESCRIPTORS: Maternal Mortality; Epidemiological Monitoring; Primary Health Care; Nursing; Prenatal Care.

RESUMEN

Objetivo: Evaluar la mortalidad materna en la Región de Salud de Piracicaba (RRAS-14) entre 2017 y 2022, analizando características y factores asociados para mejorar la atención materna. **Método:** Estudio observacional basado en 3.019 defunciones de mujeres en edad fértil, de las cuales 90 ocurrieron durante el ciclo gravídico-puerperal. Los datos fueron recolectados del Sistema de Información de Mortalidad (SIM) y de los comités de vigilancia. **Resultados:** La mayoría de las muertes ocurrió en el puerperio (53,3%), en mujeres de 15 a 49 años, predominantemente blancas (65,6%) y con educación secundaria (43,03%). Predominaron las causas indirectas (54,4%) y la mortalidad materna fue la décima causa principal de muerte en la región. El análisis de las muertes osciló entre el 45,5% en 2018 y el 50,0% en 2019. **Consideraciones:** La mortalidad materna sigue siendo, en gran medida, prevenible. Es esencial fortalecer la atención prenatal, el parto y el puerperio, junto con la cualificación de las investigaciones, para reducir desigualdades y mejorar la atención materna.

DESCRIPTORES: Mortalidad Materna; Monitoreo Epidemiológico; Atención Primaria de Salud; Enfermería; Cuidado Pre-natal.

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INTRODUCTION

Maternal mortality represents an event of great impact both for the families directly involved and for society in general, occurring at a crucial and stage of women's active lives. Indicators of this phenomenon have the potential to inform public health policies aimed at protecting life, enabling the investigation of risks associated with pregnancy and the improvement of healthcare quality. Ultimately, analyses of this nature seek to promote preventive measures and establish more effective intervention criteria[1,2] .

Brazil has seen a significant reduction in the maternal mortality rate over the past few decades. Between 1990 and 2015, the maternal mortality ratio fell from 143 to 62 deaths per 100,000 live births, corresponding to a 56% reduction. This achievement, recognized by the World Health Organization (WHO), reflects progress in public health policies implemented since the 1990s. Despite the reduction observed in recent decades, nationwide studies indicate that the Maternal Mortality Ratio in Brazil remains underestimated, particularly in regions with weaknesses in epidemiological surveillance and death investigation, as evidenced by Szwarcwald et al.[3] .

Since 1995, Maternal Death Surveillance Committees have played a fundamental role in Brazil. These initiatives operate in an inter-institutional, multidisciplinary, and confidential manner, with the objective of reviewing all maternal deaths within a specific period or region. Through a thorough analysis of each case, the committees identify contributing factors, gaps in the health system, and potential improvements, prioritizing interventions that can reduce maternal mortality in their area of operation[3-7] .

The Ministry of Health (MS) emphasizes the importance of these committees in reducing maternal deaths and improving the quality of recorded information, thereby contributing to the strengthening of health information systems. A key regulatory milestone is Ordinance No. 1,119 of 2008, which establishes guidelines for the investigation of maternal deaths in Brazil[8] .

In the region under study, the Regional Committee for the Prevention and Surveillance of Maternal and Child Mortality (CRPVMMI) was established pursuant to Resolution SS-133 of October 13, 2020[9] . The purpose of this committee is to provide technical and scientific advice to assess and investigate deaths of women of childbearing age, as well as maternal, infant, and fetal deaths. In addition, it analyzes cases of vertical transmis-

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sion of HIV and syphilis. Composed of professionals from various health agencies, the committee is dedicated to training in the surveillance of these deaths, identifying preventable factors, and preparing reports and preventive recommendations. Based on data from the Mortality Information System (SIM) , analyses are produced to inform strategic interventions.

OBJECTIVE

To analyze the activities of a regional committee, with the aim of understanding its role in monitoring maternal mortality in medium-sized municipalities in São Paulo between 2017 and 2022.

METHODOLOGY

Study Design

This is an observational time-series study that collected data retrospectively and was based on a critical analysis of the records of a Regional Surveillance Committee, including minutes, reports, and investigations of maternal deaths, in addition to SIM data. The research was conducted in accordance with the Ethical Standards and Guidelines of Resolution No. 466/2012 of the National Health Council of the Ministry of Health (CNS-MS) and submitted to a Research Ethics Committee (CEP), having been approved under protocol CAAE 70267223.7.0000.5418.

Context

The study was conducted in the Regional Health Care Network (RRAS-14) of the State of São Paulo, which covers an area of approximately 8,000 square kilometers, with a total population of 1.5 million, comprising 26 municipalities. The Regional Committee, the subject of this research, consists of various municipal committees operating as a network, comprising professionals from ten maternity hospitals, the Epidemiological Surveillance Group (GVE), the Health Surveillance Group (GVS), Women's Health, Child Health, Humanization, members of the Municipal Health Councils (CMS), the Regional Nursing Council (COREN), and the Regional Medical Council of the State of São Paulo (CREMESP). All are technically linked to the CRP VMI, ensuring an integrated and coordinated approach.

Data collection was conducted over a nine-month period through a search for epidemiological information in the investigation files of maternal deaths recorded in the SIM from 2017 to 2022 (secondary data) and descriptive document analyses based on primary data— —collected from meeting minutes, investigated case studies, and the reading of CRP VMI annual reports.

Participants

Data from 3,019 deaths of women of childbearing age were analyzed, of which 90 were maternal deaths. The documents reviewed include meeting minutes, investigation files, reports, and recommendations issued by the committee.

Variables, data sources, and measurement

The maternal mortality ratio, the outcome variable of this study, was obtained from primary data collection and calculated by dividing the number of maternal deaths by the number of live births, multiplied by 1,000, providing a measure of maternal mortality per 1,000 births.

Bias

Measures to avoid bias included data triangulation across sources (minutes, SIM, and investigation forms) and standardization of the criteria for including deaths in the study.

Study size

The sample size was determined by the maternal deaths recorded in the SIM and analyzed by the RRAS 14 committee during the period from 2017 to 2022.

Quantitative variables

The independent variables obtained from primary data included age, educational level, skin color, place of death, and period of occurrence (pregnancy, childbirth, or postpartum). For variables related to causes of mortality, derived from secondary data, the World Health Organization classification for types of maternal mortality causes was used. These were divided into: direct obstetric causes—(ICD-10: O00–O08; O11–O23; O24.4; O26–O92; A34; D39.2; E23.0; F53; and M83.0), resulting from obstetric complications during pregnancy, childbirth, or the puerperium due to interventions, omissions, inadequate treatment, or a series of events arising from any of the causes mentioned above; and indirect obstetric causes (ICD-10: O10; O24, except O24.4; O25; O98-O99; A34 and B20-B24), resulting from conditions pre-existing at the time of pregnancy or from conditions that arose during pregnancy and were aggravated by the physiological effects of pregnancy, provided that direct obstetric causes are excluded[10] .

Statistical methods

The descriptive analysis used absolute and relative frequencies. The chi-square test (χ^2) was used to assess the association between the year of occurrence and the deaths investigated. R software was used for all analyses, with a significance level of 5% (R Core Team, 2024).

RESULTS

Deaths of women of childbearing age (WCA)

Between 2017 and 2022, 3,019 deaths of women of childbearing age (WCA, 10 to 49 years) were reported in the study region. The highest inci-

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dence was recorded in 2021, with 772 deaths, of which 67.1% were investigated and concluded within the recommended 120-day period. In 2017 and 2018, respectively, 72.3% and 74.2% of deaths were investigated within the established timeframe, while in 2020 this percentage dropped to 57.7%. In 2021 and 2022, a significant proportion of cases were not investigated, with 11.3% and 13.4%, respectively, remaining unresolved in the Mortality Information System (SIM).

The predominant cause of death from unspecified viral diseases (ICD B34.2) was associated with the COVID-19 pandemic, becoming the second leading cause of death among MIF in the region in 2021. Among the 772 deaths recorded this year, 29 were classified as maternal deaths, of which 17 had COVID-19 as the underlying cause (ICD O98.5 - Maternal infectious and parasitic diseases). Maternal deaths (ICD O98) ranked tenth among causes of death for MIF during the period. In 2021, the maternal mortality rate in the region reached 1.68 deaths per 1,000 live births, with 29 maternal deaths out of a total of 17,258 live births.

Deaths of Pregnant Women and Women in the Postpartum Period

Maternal mortality varied significantly over the analyzed period. In 2017, the rate was 0.84 deaths per 1,000 live births, decreasing to 0.56 in 2018 and 0.43 in 2019. However, during the COVID-19 pandemic, this rate rose again, reaching 0.77 per 1,000 live births in 2020 and 1.68 per 1,000 in 2021. As the pandemic subsided, the rate fell to 0.71 per 1,000 live births in 2022.

Maternal deaths occurred predominantly among women aged 30 to 39 (46.7%) in 2021 and 2022, reflecting a shift in the age groups most affected over time. In 2018, the 15–19 age group accounted for 7.8% of maternal deaths, but in 2021 and 2022, no deaths were recorded in this age group.

Regarding educational attainment, there was an increase in the proportion of deaths among women with a high school diploma, rising from 25.0% in 2017 to 50.0% in 2022. Women with incomplete elementary school education accounted for 34.5% of maternal deaths. There was also a high proportion of incomplete data in the system, with 1.1% of records left blank and 5.6% with missing information. In terms of race, the majority of pregnant women who died were white (65.6%), followed by mixed-race (22.2%) and Black (12.2%) (Table 1).

Table 1. Distribution of maternal deaths in the RRAS-14 region, in the interior of the state of São Paulo, between 2017 and 2022, by age group, educational level, and race of the pregnant woman.

Variable	Category	Year						Total for the period	p-value
		2017	2018	2019	2020	2021	2022		
Age group	10 to 14	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0,0008
	15 to 19	2 (12,5%)	3 (27,3%)	1 (12,5%)	1 (7,1%)	0 (0,0%)	0 (0,0%)	7 (7,8%)	
	20 to 29	7 (43,8%)	4 (36,4%)	7 (87,5%)	3 (21,4%)	12 (41,4%)	1 (8,3%)	34 (37,8%)	
	30 to 39	5 (31,3%)	4 (36,4%)	0 (0,0%)	9 (64,3%)	15 (51,7%)	9 (75,0%)	42 (46,7%)	
	40 to 49	2 (12,5%)	0 (0,0%)	0 (0,0%)	1 (7,1%)	2 (6,9%)	2 (16,7%)	7 (7,8%)	
	Total	16 (100,0%)	11 (100,0%)	8 (100,0%)	14 (100,0%)	29 (100,0%)	12(100,0%)	90(100,0%)	
Education	No education	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0,0133
	Elementary (1–4)	2 (12,5%)	0 (0,0%)	1 (12,5%)	2 (14,3%)	3 (10,3%)	0 (0,0%)	8 (8,9%)	
	Elementary (5–8)	6 (37,5%)	5 (45,5%)	2 (25,0%)	2 (14,3%)	5 (17,2%)	3 (25,0%)	23 (25,6%)	
	Medium	4 (25,0%)	3 (27,3%)	4 (50,0%)	7 (50,0%)	15 (51,7%)	6 (50,0%)	39 (43,3%)	
	Incomplete higher education	1 (6,8%)	1 (9,1%)	0 (0,0%)	0 (0,0%)	2 (6,9%)	0 (0,0%)	4 (4,4%)	
	Bachelor's Degree	3 (18,8%)	0 (0,0%)	0 (0,0%)	3 (21,4%)	3 (10,3%)	1 (8,3%)	10 (11,1%)	
	Not specified	0 (0,0%)	1 (9,1%)	1 (12,5%)	0 (0,0%)	1 (3,4%)	2 (16,7%)	5 (5,6%)	
	Not filled in	0 (0,0%)	1 (9,1%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	1 (1,1%)	
	Total	16 (100,0%)	11 (100,0%)	8 (100,0%)	14 (100,0%)	29 (100,0%)	12 (100,0%)	90 (100,0%)	
Skin color	White	14 (87,5%)	7 (63,6%)	5 (62,5%)	6 (42,9%)	20 (69,0%)	7 (58,3%)	59 (65,6%)	0,1831
	Black	0 (0,0%)	1 (9,1%)	0 (0,0%)	5 (35,7%)	3 (10,3%)	2 (16,7%)	11 (12,2%)	
	Brown	2 (12,5%)	3 (27,3%)	3 (37,5%)	3 (21,4%)	6 (20,7%)	3 (25,0%)	20 (22,2%)	
	Yellow	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	
	Total	16 (100,0%)	11 (100,0%)	8 (100,0%)	14 (100,0%)	29 (100,0%)	12 (100,0%)	90 (100,0%)	

Source: Mortality Information System (SIM).

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Location of Maternal Deaths

Maternal mortality was higher among pregnant women attended at public or charitable hospitals (0.84 deaths per 1,000 live births), followed by those attended at private facilities (0.68 deaths per 1,000 live births). The highest rate was observed among women who did not access maternity facilities, with 0.99 deaths per 1,000 live births (Table 2).

Table 2. Maternal mortality ratio (deaths per 1,000 live births) in the inland region of the state of São Paulo between 2017 and 2022, by type of health facility.

Health facilities	Year						Total
	2017	2018	2019	2020	2021	2022	
Establishments/private	0,90	0,21	0,23	0,74	1,56	0,52	0,68
Agreements/Public	0,92	0,65	0,42	0,60	1,60	0,90	0,84
Others*	0,39	0,79	0,81	1,68	2,28	0,00	0,99
Total	0,84	0,56	0,43	0,77	1,68	0,71	0,82

*Locations where births do not occur and/or outside our region (Emergency Care Units, Health Centers).
Sources: Annual reports of the Regional Committee on Maternal and Child Mortality Prevention and the Mortality Information System (SIM)

Causes of Maternal Death

Among the leading causes of maternal death, ICD-10 code O98 (Infectious and parasitic diseases) stands out, accounting for 26.7% of deaths, with COVID-19 being the predominant cause in 2020 and 2021. Other relevant causes included O14 (Gestational hypertension with significant proteinuria), accounting for 6.7% of deaths, O10 (Pre-existing hypertension complicating pregnancy), with 1.1%, and O15 (Eclampsia), with 3.3% of cases. In addition, puerperal infections (ICD O85 and O86) and genitourinary tract infections during pregnancy (ICD O23) accounted for 6.66% of maternal deaths during the period (Table 3).

Table 3. Distribution of maternal deaths in the analyzed region of the interior of the state of São Paulo between 2017 and 2022, according to the cause of maternal deaths investigated in the system. p=0.2135 (obstetric cause).

Variable	Year						Total
	2017	2018	2019	2020	2021	2022	
Deaths Investigated	16 (100,0%)	11 (100,0%)	4 (28,6%)	4 (28,6%)	0 (0,0%)	2 (16,7%)	37 (41,1%)
Direct obstetric cause	10 (62,5%)	6 (54,5%)	5 (62,5%)	7 (50,0%)	8 (27,6%)	5 (41,7%)	41 (45,6%)
Indirect obstetric cause	6 (37,5%)	5 (45,5%)	3 (37,5%)	7 (50,0%)	21 (72,4%)	7 (58,3%)	49 (54,4%)
Total deaths	16 (100,0%)	11 (100,0%)	8 (100,0%)	14 (100,0%)	29 (100,0%)	12 (100,0%)	90 (100,0%)

Sources: Annual reports of the Regional Committee for the Prevention of Maternal and Infant Mortality and the Mortality Information System (SIM)

Activities of the Regional Committee for the Surveillance and Prevention of Maternal and Infant Mortality

Of the total maternal deaths, 45.6% were caused by direct obstetric complications and 54.4% by indirect obstetric causes. In 2021 and 2022, the percentage of deaths investigated was low, with only 0.0% and 16.7% of cases investigated, respectively, well below the SIM's recommendation. In 2017 and 2018, all cases were investigated within the established timeframe.

The meetings of the Regional Committee for Surveillance and Prevention of Maternal and Infant Deaths reviewed 50% of the cases from 2019 and 45.5% of the cases from 2018. In 2022, only one case was analyzed (8.3%). The COVID-19 pandemic interrupted the committee's annual visits to health services in 2020 and 2021. However, specific protocols were developed for the care of pregnant women vulnerable to COVID-19 (Table 4).

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Table 4. Distribution of maternal deaths in the analyzed region of the interior of the state of São Paulo between 2017 and 2022, based on the analysis, presentation by the Regional Committee, and recommendations

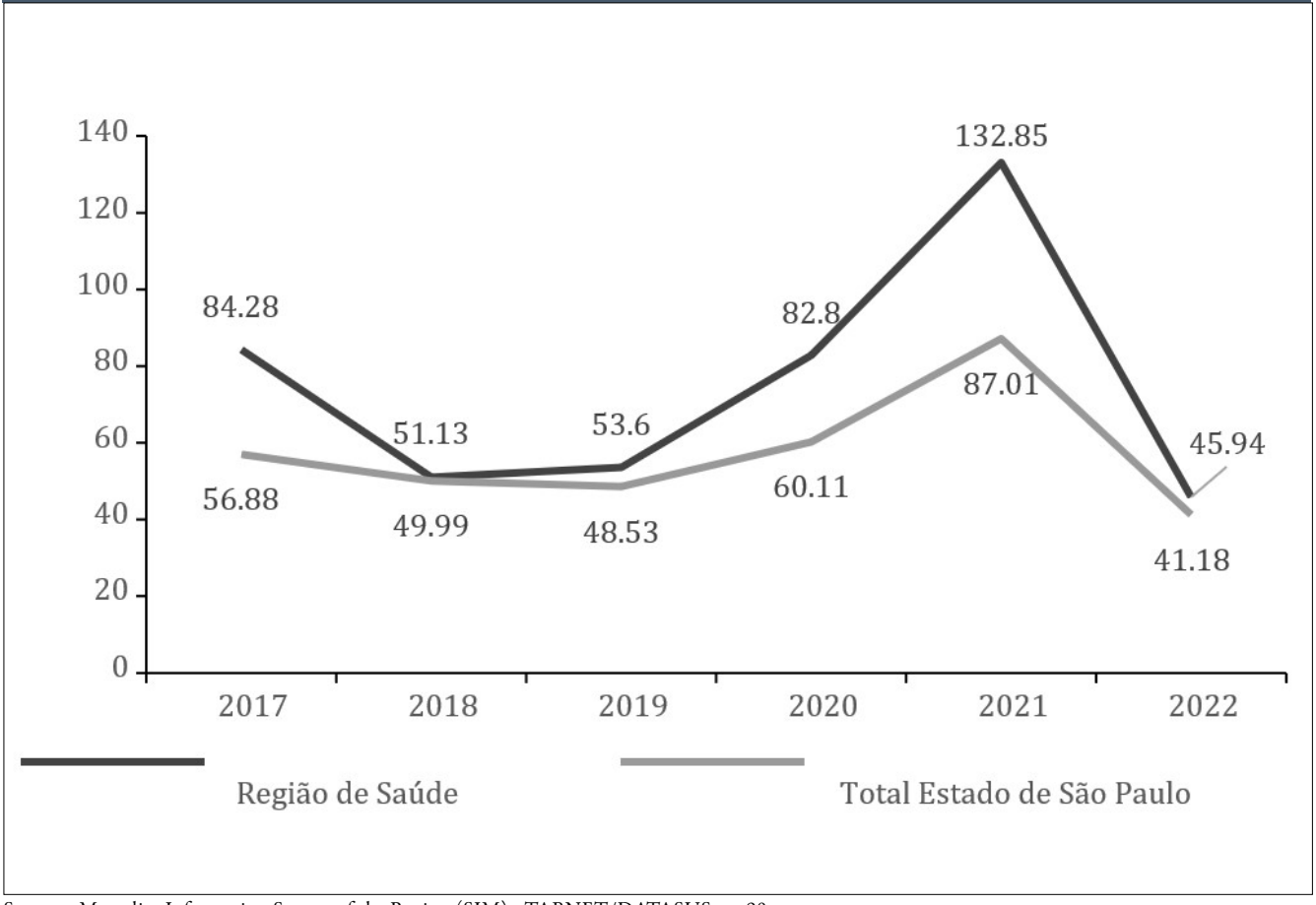
Analysis of deaths	Year						Total
	2017	2018	2019	2020	2021	2022	
Analyzed	2 (12,5%)	5 (45,5%)	4 (50,0%)	4 (28,6%)	2 (6,9%)	1 (8,3%)	18 (20,0%)
Reports	0 (0,0%)	3 (27,3%)	0 (0,0%)	2 (14,3%)	1 (3,4%)	0 (0,0%)	6 (6,7%)
Recommendations	1 (6,3%)	6 (54,5%)	0 (0,0%)	3 (21,4%)	1 (3,4%)	0 (0,0%)	11 (12,2%)
Total deaths	16 (100,0%)	11 (100,0%)	8 (100,0%)	14 (100,0%)	29 (100,0%)	12(100,0)	90 (100,0%)

Sources: Annual reports of the Regional Committee on Maternal and Child Mortality Prevention and the Mortality Information System (SIM)

Regional Comparison

The Maternal Mortality Ratio (MMR) in the analyzed region was 84.29 per 100,000 live births in 2017, falling to 70.62 in 2022. During the pandemic, the MMR peaked at 168.04 in 2021, reflecting the impact of COVID-19. In the state of São Paulo, the MMR was 35.71 in 2022, indicating a significant disparity between the region under study and the state as a whole (Figure 1).

Figure 1. Comparison of the Maternal Mortality Ratio (MMR) in the health region and in the State of São Paulo from 2017 to 2022.



Sources: Mortality Information System of the Region (SIM) - TABNET/DATASUS, n=90

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DISCUSSION

Data analysis revealed a significant increase in the Maternal Mortality Ratio (MMR) in the studied region, rising from 42.88 to 168.04 deaths per 100,000 live births between 2019 and 2021, as a direct consequence of the COVID-19 pandemic. Despite the presence of health services in the region, the shortcomings in maternal care during this period highlight the urgent need for improvements in infrastructure, qualified care, and timely investigation of maternal deaths as fundamental prevention strategies. The significant increase in the MMR observed in this study may be related, in part, to improved identification and classification of maternal deaths, a phenomenon already described by Szwarcwald et al.[3] , who highlight the impact of active investigation on the visibility of the condition.

The MMR is directly related to the quality of reproductive health care and the socioeconomic development of regions. In developed countries, this rate is approximately 7.8 per 100,000 live births, while in developing nations the figures are much higher, such as in Bolivia (230/100,000) and Haiti (523/100,000). These figures demonstrate that the Americas y of the world's greatest disparities in maternal mortality[11] .

Data from the Ministry of Health (MS), analyzed by the Brazilian Obstetric Observatory (OOBr), show a concerning rise in maternal mortality in Brazil. In 2019, the rate was 55.31 per 100,000 live births. In 2020, this figure rose to 71.97 deaths per 100,000 live births, indicating an increase of nearly 25% compared to the previous year. In 2021, during the pandemic, the maternal mortality rate in the state of São Paulo rose by 80.56%, while in Brazil, the rate increased by 94%, reaching levels seen two decades ago, with 43% of deaths attributed to indirect causes, reflecting shortcomings in reporting and in the training of professionals responsible for these records (UNFPA).

The rate reached 107.53 deaths per 100,000 live births, highlighting the urgency of actions to improve maternal health. Overall, the increase in maternal mortality was 77% between 2019 and 2021 in the analyzed region, while the WHO target is 30 maternal deaths per 100,000 live births[12-15] .

Most maternal deaths are considered preventable, with estimates suggesting that approximately 90% of deaths could be prevented, which characterizes maternal mortality as an important sentinel indicator of the quality of health care. As highlighted by Laurenti et al.[4] , timely interventions at the primary and hospital levels, combined with adequate investigation of deaths, are fundamental for identifying gaps in care and for improving the health system's response. However, inadequacies in the completion of death certificates, as well as delayed or incomplete case investigations, hinder epidemiological analysis and the planning of effective interventions[12,16] . The systematic implementation of these measures has the potential to significantly reduce the occurrence of preventable maternal complications and deaths[17,18] .

The weaknesses observed in the completion of death certificates and in case investigations, especially in the most recent years of the study period, are similar to those described by Santana et al.[19] , who identified underreporting and inconsistencies in information on maternal mortality in the Municipal Mortality Information System.

It is known that women are exposed to factors associated with external causes and chronic diseases, such as obesity and diabetes mellitus, which lead to complications during pregnancy. Hypertension is the leading cause of maternal death, accounting for 20% of maternal deaths in Brazil[20,21] .

Improvements in prenatal care, childbirth, and postpartum care are crucial for preventing avoidable deaths. Maternal mortality is associated with factors such as low educational attainment, lower income, and difficulty accessing health services. Strategies include humanized and continuous training of professionals and strengthening regional committees, which play an essential role in analyzing and preventing deaths[9,22,23] .

The study also noted that many maternal deaths are not included in the statistics due to the limitations of the WHO definition, which considers only deaths up to the 42nd day post-gestation. With technological advances in healthcare, even cases with severe complications can survive beyond this period and die after the 42nd day due to maternal causes[10,24] .

In 2022, the Regional Committee continued its efforts to establish connections between Primary Care (PC) and Maternity Referral Services. The main challenge was maintaining the composition and functioning of each committee due to management changes. In 2023, in-person meetings continued to take place monthly and were considered an indispensable forum. It is important to emphasize that this established forum provides indicators that drive processes of analysis and shared decision-making, promoting actions such as autonomy and collective leadership. When combined with process analysis, these indicators offer a snapshot of reality that must be recognized within a broader context.

Among the difficulties encountered in combating maternal mortality are inconsistencies in the data on investigation forms and problems in completing maternal death certificates. These issues can hinder the true understanding of the magnitude of the problem and the effective implementation of policies and programs to address it.

Given this scenario, it is necessary

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to prioritize public policy actions aimed at reducing maternal mortality, especially considering the high maternal mortality rate (MMR), which is mostly due to preventable causes. Investments in improving the quality of health services—including family planning, prenatal care, childbirth assistance, and postpartum care—are essential for preventing maternal deaths. Furthermore, it is essential to ensure that women have access to a high-quality healthcare network with effective referral and counter-referral systems, adequate transportation, and trained professionals to reduce deaths resulting from unsafe abortion and hypertensive emergencies. These measures are indispensable for protecting women's lives and health during the pregnancy and postpartum period.

CONCLUSION

It is concluded that there was a significant increase in the Maternal Mortality Ratio (MMR) during the COVID-19 pandemic, highlighting shortcomings in the quality of maternal care, even in regions with good service availability. Risk factors such as complications during childbirth, insufficient access to prenatal care, and untreated underlying medical conditions were identified, in addition to social and cultural barriers that hinder access to healthcare. The Regional Committee for the Prevention and Surveillance of Maternal Mortality played a crucial role in evaluating deaths and implementing preventive measures. Strengthening municipal and regional committees with adequate resources is essential for improving the monitoring and prevention of maternal deaths, as well as strict compliance with existing legislation.

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