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Maternal Mortality, Health Determinants, and Covid-19 in the Department of Meta, Colombia: A Cross-sectional Study

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Abstract:

Introduction: Maternal mortality is an important indicator of the quality of life and efficiency of the healthcare system of a country. Given that it is still a substantial public health concern in Colombia, we aimed to describe the determinants of health identified in maternal deaths registered at the Department of Meta, Colombia, from 2018 to 2021 and to understand their causes or underlying mechanisms by applying the SDH framework.

Materials and Methods: This retrospective cross-sectional study was conducted using a quantitative approach and involved a review of databases from the maternal mortality epidemiological surveillance system in the Department of Meta during 2017–2022. The analysis involved a multinomial logistic regression to assess risk associations.

Results: Overall, 59 patients were included, with an average age of 29.92 (range: 15–46) years and a median age of 30 years. Maternal mortality had a significant increase in its incidence during the pandemic, especially indirect causes. The logistic regression suggests low income, low educational level, low autonomy of women, being indigenous, and living in rural areas as possible associated factors.

Conclusion: There is evidence of a significant impact on maternal mortality due to COVID-19, reflecting the low response capacity of the Colombian health system and the difficulties of access and information for pregnant women. Further, indirect causes of death must be prioritized in the public health agenda.

Keywords: Maternal mortality, COVID-19, Health system, WHO, Pandemic, UN.

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1. INTRODUCTION

Maternal mortality (MM) is a significant public health concern. According to the World Health Organization (WHO), it is defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes" [1]. In 2015, the United Nations (UN) adopted an equity-centered approach to maternal and perinatal mortality as the third sustainable development goal (SDG). Further, to reduce the rates of MM worldwide, WHO adopted SDG 3.1, which aimed to reduce the global MM ratio to < 70 deaths per 100,000 live births by 2030 [1].

Although the trend suggests a decline in MM, the coronavirus disease 2019 (COVID-19) pandemic led to a

significant increase in the rate of MM worldwide. In a study by WHO on maternal death trends in terms of MM ratio (MMR), MMR was defined as the number of deaths in women of reproductive age (15–49 years) per 100,000 live births. During 2000–2020, in Colombia, MMR was 90, 71, and 75 in 2000, 2010, and 2020 per 100,000 live births, indicating an increase in the number of cases at the beginning of the pandemic [1, 2].

Remarkably, MM is the end result of various factors affecting women of childbearing age. These factors may be related to the social context, health status, or quality of and access to maternal healthcare services. In addition, inequalities in healthcare may play a role, and these can be explained by different determinants, which can be divided into structural and intermediate categories (corresponding to distal and proximal causative factors in the sociological literature, respectively) according to the Commission on Social Determinants of Health [3, 4]. Altogether, the above factors represent the social determinants of health (SDH). Further, structural determinants are those that particularly create or reinforce social stratification and thus lead to health inequalities [5].

The International Classification of Diseases for MM (ICD-MM) has classified the causes of MM into direct and indirect biomedical categories. Notably, in low-income countries, most deaths occur due to direct obstetric complications during pregnancy, childbirth, or postpartum because of incorrect treatment and omissions [1]. Conversely, indirect deaths occur due to an exacerbated pre-existing disease. Further, non-communicable diseases have become increasingly important, and particularly, hypertension, obesity, and diabetes are more frequently seen among pregnant women [1]. Currently, women tend to conceive later in life, and the association of the above-mentioned noncommunicable diseases with communicable diseases, such as COVID-19, can have severe consequences on the outcomes of pregnancy [5]. This is because direct mortality is considered more important in medical practice than indirect mortality; moreover, mortality analysis units focus more on direct mortality [1]. Meanwhile, the classification of coincidental causes based on the WHO guidelines for the application of the International Classification of Diseases ICD-10 to MM has also been considered. This includes deaths occurring during pregnancy, childbirth, or postpartum, and their nosological classification includes external causes of injury due to motor vehicle accidents, attack-assault, rape, other accidents, herbal remedies, *etc* [1].

However, the biomedical approach based on this classification hinders the identification of the social causes behind the adverse outcomes faced by such women. In general, these causes include socioeconomic and political contexts, structural mechanisms, and socioeconomic strata. Particularly, socioeconomic and political contexts represent any structure, institution, or socioeconomic and political relationship in a society. These factors create and maintain social hierarchies within a society through structural mechanisms related to different socioeconomic strata, classifying populations by class, sex, race/ethnicity, income, education, occupation, or other characteristics. Therefore, structural determinants act *via* a series of intermediate determinants, creating different conditions that affect health. Intermediate determinants include individual factors that influence health outcomes, such as circumstances related to economic, living, and working conditions; psychological circumstances; behavioral and/or biological factors; and factors associated with the context of the community and healthcare system [6]. In particular, the SDH framework highlights the importance of structural factors in the emergence of different health risks for different health outcomes [6, 7]. In addition, in this framework, power is emphasized as a crucial factor determining social hierarchies and, thereby, health differences between the groups. Finally, this framework can be used to examine the structural aspects and intermediate factors of health inequalities, including maternal health, and to understand the underlying mechanisms or the causal chains that link these factors [8, 9].

The application of the SDH framework may play a significant role in addressing maternal health inequities in Colombia, which requires exploration and a clear understanding of the structural and intermediate factors involved in such inequities as well as the mechanisms by which they are connected to achieve an effective and sustainable application [10-12]. In the present study, we adapted the SDH framework to maternal health by integrating three frameworks widely applied in maternal health factors: the three delays model framework developed by Thaddeus and Maine in 1994 (initially published in 1990), McCarthy and Maine's framework on the distant and immediate determinants of maternal health developed in 1992 [13], and the United Nations International Children's Emergency Fund framework [13]. Further, based on our context and the model of Colombian public health surveillance, we adopted the following determinants identified in the unit analysis of MM: women, family, community, and health system.

To improve the prevention of MM in Colombia, each local entity must conduct a unit analysis of MM for each reported case. Notably, in these units, the stages of the process leading to fatal outcomes are followed up, and health services are analyzed in terms of access, quality, compliance with clinical practice guidelines, and barriers to healthcare access. Remarkably, the determinants of health assessed at such units are the vulnerability of women, family, social, and community support networks, and autonomy in decision-making. Finally, the cause of death is determined, and an improvement plan is developed.

Given the above background, the present study aimed to describe the determinants of health identified in maternal deaths registered at the Department of Meta, Colombia, from 2018 to 2021 and to understand their causes or underlying mechanisms by applying the SDH framework.

2. MATERIALS AND METHODS

This retrospective cross-sectional study was conducted *via* a quantitative approach. In this study, we included the confirmed cases of MM based on the inclusion criteria of the

protocol established by Instituto Nacional de Salud (National Institute of Health, INS) using the national epidemiological surveillance system (SIVIGILA) and Web-based maternal mortality epidemiological surveillance system SVEMMBW application from 2018 to 2022 in the Department of Meta, Colombia.

The MM registration records in the Department of Meta were reviewed, especially regarding socio-demographic variables: maternal characteristics (gynecological and obstetric records), ethnicity, age, education, vulnerability, marital status, employment status, average monthly income, health system, religion, whether the woman was head of the family, BMI before and after pregnancy, family planning, morbidity during pregnancy, emergency care, prenatal examinations, whether the pregnancy was planned, gynecological and obstetric records, reported cause of death, *etc*. The SVEMMBW software provides variables on the determinants of health focused on the women's autonomy, such as making personal and family decisions, the family, social and community support network and access to health services. In Colombia, social health security has three types of insured: those who have the ability to pay are insured under a contributory regime, those who do not have the ability to pay are insured under a subsidized regime, and militaries, congressmen, and professors correspond to the special regime. The socioeconomic strata range from 1 to 5, with 1 corresponding to the lowest income and 5 to the highest income.

• Inclusion criterion: all cases reported and confirmed by SIVIGILA 2018-2022

• Exclusion criteria: unconfirmed cases, patients with missing clinical data or those who did not fulfill the criteria for MM, and patients belonging to other territorial divisions.

Finally, the data of the participants were recorded in an Excel sheet, and data analysis was conducted using the STATA software. In addition, a univariate analysis was performed to estimate absolute and relative frequencies and to describe the behavior and trends of sociodemographic variables. Additionally, variables related to the women's autonomy, access to healthcare, healthcare received, barriers to access, and sociocultural and mortality aspects were analyzed. Simultaneously, variables associated with early, late, and coincidental deaths, as well as their relationship with pregnancy in terms of direct, indirect, and external causes, were analyzed. The present analysis was conducted in accordance with the surveillance protocol, and multinomial logistic regression was used to determine potential risk associations and understand the extent and association between variables; further, the chi-square test was used to determine the significance of the risk association.

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki and Resolution 8430 of 1993 by the Ministerio de la Protección Social (Ministry of Social Protection) of Colombia. According to Article 11 of Resolution 8430/93 of the Ministry of Health and Social Protection, it is a risk-free investigation, given its retrospective temporality and based on a documentary review, which is why informed consent was not required. Furthermore, the study was approved by the Bioethics Committee of Universidad Cooperativa de Colombia.

3. RESULTS

Overall, 59 cases of MM were reported from 2018 to 2022; of these, 27.12% were reported in 2018–2019 (before the pandemic), and 75.88% were reported in 2020–2022 (during the pandemic) Chi2 p=0.000001. There was a significant increase in the incidence of MM during the COVID-19 pandemic, with MMR per 100,000 live births increasing from 68.3 in 2019 to 132.28 in 2021 (Table **1**).

Table 1. Maternal mortality ratio per year in the department of meta during 2018–2022.

Maternal Mortality in Meta during 2018–2022			
Year	**Frequency**	**%**	**MMR × 100,000 Live Births**
2018	6	10.17	38.9
2019	10	16.95	68.3
2020	16	27.12	104.23
2021	20	33.9	132.38
2022	7	11.86	48.8
Total	59	-	-

Source: Own elaboration based on data from SIVIGILA in the Department of Meta during 2018–2022.

Table 2. Case distribution of maternal mortality by age in the department of meta during 2018–2022.

Age Group	Frequency	%
< 18 years	1	1.7
18–25 years	18	30.5
25–34 years	23	39
> 35 years	17	28.8

Source: Own elaboration based on data from SIVIGILA in the Department of Meta during 2018–2022.

The average age of the participants was 29.92 ± 7.7 (range: 15–46) years with a median of 30 years (95% CI: 22.22–37.62). Notably, the incidence of MM was higher in patients aged 25–34 years, accounting for 39% of cases (Table **2**).

3.1. Sociodemographic Characteristics

Regarding social stratification, strata 1 and 2 (*i.e.*, lower income strata) had higher numbers of MM cases (86.44%), with 42.37% and 44.07% cases, respectively. Regarding the area of residence, the highest incidence of MM was found in the municipal seat, with 42 deaths (71.9%), whereas the lowest incidence was found in the rural settlement in 2017–2022, with 5 deaths (8.47%) (Table **3**).

Regarding the hospital admission, 76.27% of women were hospitalized, whereas 23.73% were not.

The municipalities with the highest incidence of MM were Mapiripan, Puerto Gaitán, and La Uribe, which have a scattered rural population of indigenous origin as well as inequalities in terms of admission and access to healthcare services (Table **4**).

3.2. Classification of the Cases of MM

Regarding the classification of MM in the departmental analysis units, 40.68% of cases were classified as late MM and 59.32% as early MM. Further, based on the analysis of the type of cause, 62.71%, 28.81%, and 8.47% of deaths were due to indirect, direct, and coincidental causes, respectively.

Table 3. Socioeconomic characteristics of maternal mortality in the department of meta during 2018–2022.

Sociodemographic Characteristics		Cases	%
Area where the case occurred	Municipal seat	42	71.19
-	Populated rural settlements	5	8.47
-	Scattered rural settlements	12	20.34
Ethnicity	Indigenous	8	13.56
-	Half-blood	51	86.44
Social Security health regime	Contributive system	15	25.42
-	Subsidized system	37	62.71
-	No insurance	5	8.48
-	Special regime	2	3.39
Socioeconomic stratum	Stratum 1	25	42.37
-	Stratum 2	26	44.07
-	Stratum 3	8	13.56
-	Stratum 4	0	0
Educational level	Basic primary school	12	34.38
-	Basic high school	10	28.13
-	Technical or university degree	10	28.13

Source: Own elaboration based on data from SIVIGILA in the Department of Meta during 2018–2022.

Table 4. Incidence of maternal mortality by the municipality in the department of meta during 2018–2022.

Incidence of Maternal Mortality by Municipality in Meta during 2018–2022				
Municipality	**Frequency**	**%**	**Population**	**Incidence**
Acacias	6	**10.17**	93323	6.43
El Castillo	1	1.69	7527	**13.29**
Fuente de Oro	1	1.69	12587	7.94
Granada	8	13.56	71725	11.15
La Macarena	1	1.69	28508	3.51
La Uribe	2	3.39	9634	**20.76**
Mapiripan	3	5.08	7271	**41.26**
Puerto Gaitán	12	20.34	44314	**27.08**
Puerto López	2	3.39	30799	6.49
San Martín	2	3.39	26925	7.43
Villavicencio	20	33.90	554173	3.61
Vista Hermosa	1	1.69	17060	5.86

Source: Own elaboration based on data from SIVIGILA in the Department of Meta during 2018–2022.

Table 5. Pooled causes of maternal mortality in the department of meta during 2018–2022.

Pooled Causes of Maternal Mortality	Frequency	%
Unexpected treatment complications	1	1.7
Coincidental causes	5	8.45
Abortion due to a thromboembolic event as an indirect cause	2	3.38
COVID-19	7	11.9
Thromboembolic events or other indirect base causes	0	0
Thromboembolic event as a base cause	2	3.38
Obstetric hemorrhage	8	13.52
Other direct causes	1	1.69
Other indirect causes	15	25.35
Nonobstetric sepsis	3	5.07
Sepsis associated with pregnancy	4	6.76
Hypertensive disorder associated with pregnancy	11	18.59
Total	59	100

Source: Own elaboration based on data from SIVIGILA in the Department of Meta during 2018–2022.

Analysis of MM in terms of the weeks of gestation revealed 70.59% deaths in the third trimester (from week 25 to birth), 29.41% in the second trimester (from week 13 to week 24), and no deaths in the first trimester (from week 0 to week 12).

Based on the pooled causes of death according to ICD-10, the most common cause of death was found to be hypertensive disorder associated with pregnancy, followed by obstetric hemorrhage and sepsis associated with pregnancy, COVID-19 during 2020–2021, and coincidental causes; notably, most of these causes were related to violence (Table **5**).

3.3. Determinants of Health

3.3.1. Women's Autonomy

Regarding the employment status of the participants, 8.4% of women were employed, 44.06% were unemployed, and 47.45% provided no information. In most cases (32.20%), the spouses of women made decisions related to the family; conversely, in 5.08% of cases, both women and their spouses made the decisions, and in 3.38% of cases, only women made the decisions. The above data reflect a high degree of economic dependence among the participants. In terms of religion, 40.67% of women were Catholics, 5.08% were Christians, and 1.69% belonged to other religious groups, such as indigenous and polytheistic indigenous groups.

Women performing home practices during pregnancy accounted for 3.38% of MM cases, and those who did not perform these practices accounted for 38.98% of cases; meanwhile, women who were not aware of home practices accounted for 3.38% of cases.

3.3.2. Income and Living Conditions

We also assessed the average family monthly income; 70.89% had an income of ≤1,300,000 Colombian pesos, which is the minimum salary in Colombia (USD 288), and 62.96% reported that this income supported a family of 2–3 people. Notably, 40% reported a lack of access to public services, including water, sewerage systems, and electricity.

3.3.3. Family, social and Community Support Networks

Regarding support networks, 3.33%, 94%, and 94% of participants reported having community, family, and social support, respectively. Notably, 31.03% had access to communication media, such as a cell phone.

3.3.4. Health System, Quality, and Access

Women with morbidity in previous pregnancy accounted for 40.63% of cases. Further, 14.71% had requested consultation before conception; 71.05% had a history of 1–3 pregnancies, including their current pregnancy; 76.32% had given 1–3 live births; 73.68% had given vaginal births; 15.79% had a history of previous abortions; and 26.32% had a history of previous C-section.

In addition, 8% of women considered having an abortion that resulted in death. Further, 62.07% reported planning to become pregnant, and 67.57% had undergone prenatal checkups, of whom 52.82% had undergone ≥4 prenatal checkups. Regarding the timing of starting prenatal checkups, 74.97% of the participants started the checkup in the first trimester, 21.42% in the second trimester, and 3.47% in the third trimester.

Regarding women undergoing prenatal checkups, 10.71% did not receive information about alarming signs during pregnancy, and 33.33% perceived that they had a serious disease during pregnancy.

In terms of access to healthcare systems, 42.75% of women reported being ≤15 minutes away from the healthcare center, 30.8% reported being 15–60 minutes away, and 11.55% reported being > 60 minutes away. The waiting time before the checkup was ≤7 days in 47.6% of cases and ≥7 days in 52.4% of cases. The place of death was the hospital in 93.33% of cases and home in 6.67% of cases. Notably, despite the death of the mother, the fetus survived in 61.29% of cases.

Table 6. Maternal mortality in the department of meta during 2018–2022 by classification and determinants of health.

-		Direct			Indirect		
Variable	**Risk Factor**	**OR**	**CI**	**p**	**OR**	**CI**	**p**
Sociodemographic Characteristics of Women							
Age	35 years	0.98	0.27–3.5	0.18	**4.59**	1.47–14.31	0.001
Area of residency	Rural	**2.19**	0.72–6.64	0.024	0.57	0.21–1.56	0.048
Ethnicity	Indigenous	**1.366**	0.31–5.83	0.086	0.77	0.21–2.77	0.0236
Social stratum	Low stratum, 1–2	**2.66**	0.31–22.8	0.05	0.568	0.19–1.67	0.87
Income level	Less than 1.2 million Colombian pesos per month	**4.5**	0.48–4.19	0.88	0.66	0.17–2.58	0.75
Educational level	Primary education, 1–5 years of education	**1.27**	029–5.48	0.98	**1.17**	0.37–3.68	0.95
Social Security health regime	Subsidized regime (low income)	**1.2**	0.3–4.25	0.92	0.87	0.35–2.18	0.87
Younger than 20 years, no education	Yes	**2.08**	0.16–26.9	0.47	0.69	0.05–8.25	0.47
Employed	No	0.76	0.12–4.35	0.76	**1.08**	0.22–5.16	0.54
Understanding of sexual and reproductive rights	No	**2.66**	0.36–19.7	0.106	0.44	0.04–4.63	0.245
Decisions are made independently by the mother	No	0.32	0.06–1.6	0.07	**3.695**	0.39–34.5	0.66
Social and community support	No	0.31	0.01–5.4	0.003	0.65	0.03–11.1	0.04
Access to communication media	No	0.62	0.13–2.9	0.35	**1.2**	0.32–4.46	0.78
Health System							
Preconception consultation	No	0.51	0.09–2.63	0.106	**1.63**	0.28–9.4	0.54
Number of pregnancies	First	0.3	0.07–1.28	0.43	**1.8**	0.63–5.2	0.07
Prenatal checkups	No	0.9	0.2–4.01	0.55	**1.2**	0.39–3.62	0.02
Number of prenatal checkups	Less than 4	0.89	0.2–3.3	0.91	0.89	0.3–2.5	0.24

3.4. Multivariate Analysis

To calculate the prevalence ratios, categorized according to the type of death, a bivariate analysis was performed using 2 × 2 tables. Regarding direct MM, living in rural settlements, belonging to an indigenous population, belonging to a lower class, having a low income, having a low level of education, being under 20 years of age, and having a lack of education and awareness of sexual and reproductive rights were identified as possible risk factors in the study. Regarding indirect MM, we identified the following possible risk factors: being older than 35 years, having a low level of education, being pregnant and unemployed, not making independent decisions, not having access to communication media, not undergoing preconception consultations, not undergoing prenatal checkups, and being pregnant for the first time (Table **6**).

4. DISCUSSION

The results of our study enable the identification of risk factors for MM among the participants; these factors included the age of 25–34 years, living in a rural settlement, belonging to an indigenous ethnic group, having a low income, and having a low level of education. It is noteworthy that these factors are SDH and have also been identified in other studies conducted in similar contexts. Meanwhile, the association between living in rural settlements and poverty continues to pose a risk to the sexual and reproductive health of women, and this is specifically replicated in low- and middle-income countries [14-16].

Regarding the causes of maternal death, the frequency of indirect maternal deaths during the study period was remarkably high, including deaths due to pre-existing diseases exacerbated by pregnancy or those due to non-obstetric causes. In most cases, these causes lead to early deaths during pregnancy or within 42 days after childbirth. However, the findings of our study are inconsistent with similar studies from low-income countries, although the effects of the pandemic from 2020 to 2022 may have changed the effects of these causes [17, 18].

Notably, the causes of death registered in ICD-10 are still very significant, indicating that, historically, hypertension due to pregnancy, postpartum hemorrhage, and sepsis remain the most common causes. However, the pandemic increased the incidence of indirect mortality.

The present study identified the following two underlying factors of MM at the Department of Meta, Colombia: 1) sociodemographic characteristics of women and 2) care received by them in the healthcare systems. Based on the multinomial analysis, among the sociodemographic factors, extreme age groups (< 20 years old without any schooling and > 35 years old), residing in scattered rural settlements, having low income and educational level, and having limited knowledge of sexual and reproductive rights are the factors compounded by health system determinants, particularly the absence of preconception consultations and inadequate prenatal care [12, 19-21].

The COVID-19 pandemic has undoubtedly increased MM in Meta from 2020 to 2021, particularly in cases of indirect MM related to inequalities and health determinants. This was especially pronounced in the most

economically deprived and geographically remote communities, highlighting the challenges associated with accessing and utilizing sexual and reproductive health services. A major shortcoming of the healthcare system is the lack of prioritization of pregnancy, as reflected in the poor quality and rarity of prenatal checkups. These results are consistent with the findings of the UN report [22-24].

The implementation of promotion and prevention measures in rural settlements within the Colombian health system is severely lacking. Although the population is connected to a health system, there are no initiatives to promote access and intervention for risk factors that cause preventable mortality. Moreover, health insurance companies prioritize treatment and rehabilitation over health promotion and disease prevention. Meanwhile, the situations of these individuals, as well as government neglect and illegal economic activities (such as drug trafficking and the presence of violent armed actors) in rural settlements, further complicate equitable access to health systems for communities, particularly affecting the most vulnerable populations [25, 26].

To ensure timely intervention for factors related to indirect MM, in-depth research on how to conduct prenatal checkups is needed, and this is particularly important in Colombia, given the high prevalence of hypertension, diabetes, and obesity. Notably, these diseases are insufficiently controlled due to the low effectiveness of health promotion and disease prevention measures. Further, the pressure to classify MM into direct and indirect types has led healthcare professionals to believe that direct deaths are somehow more important and should receive more attention. However, the prevalence of noncommunicable diseases among young women is increasing. Therefore, this classification can be misleading and lead to biases in clinical care, interventions by epidemiological analysis units on MM, and poor proactivity of insurance companies toward underlying risks. Finally, a noncommunicable disease and an acute event, such as COVID-19 can be a potentially fatal combination for pregnant women [27].

This study has some limitations. First, there was limited access to information, particularly about indigenous communities. Second, there was a dependency on third parties for such information, which did not always provide complete information. Therefore, not all data were collected, and the study did not reach its optimal significance. Further, intervention strategies in primary healthcare should be designed to positively influence the observed determinants and mitigate the incidence of painful deaths in the population.

CONCLUSION

This study indicates the importance of intervening in the determinants of health as a primary care strategy in order to effectively impact the risk factors of pregnant women with a rights-based approach and seeking to strengthen family and community support networks, which requires intersectoral actions. The health system must improve in facilitating access to services for pregnant women and also improve the quality of prenatal care, and pay more attention to comorbidities, complementing the determinant approach in primary health care, in order to effectively mitigate these preventable deaths.

MM is critical to public health as it reflects the progress of a country. Moreover, it has been included in SDGs owing to its impact on orphans and family disintegration. Although the biomedical perspective traditionally focuses on clinical aspects, our study suggests the importance of considering the determinants of health as the primary strategy to effectively address the risk factors affecting pregnant women. This approach prioritizes the rights of women and aims to strengthen family and community support networks. Further, these activities require intersectoral action, and to effectively reduce these preventable deaths, the health system should improve access to health services for pregnant women as well as the quality of prenatal checkups.

LIST OF ABBREVIATIONS

MM	=	Maternal Mortality
WHO	=	World Health Organization
UN	=	United Nations
SDG	=	Sustainable Development Goal
SDH	=	Social Determinants of Health
MMR	=	MM Ratio

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Institutional Bioethics Committee of Universidad Cooperativa de Colombia.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki and Resolution 8430 of 1993 by the Ministerio de la Protección Social (Ministry of Social Protection) of Colombia.

CONSENT FOR PUBLICATION

This retrospective study was based on temporality and a documentary review, which is why informed consent was not required.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The Data supporting the article's findings are available at Papyrus-datos.com, DOI doi:10.57924/7IIPM3 and at Zenodo DOI: 10.581/10697139.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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