

**SMFM SPECIAL STATEMENT**

# Society for Maternal-Fetal Medicine Special Statement: Assessing and using maternal mortality data

**Society for Maternal-Fetal Medicine (SMFM), SMFM Health Policy and Advocacy  
Committee, SMFM Publications Committee**

**Correspondence**

The Society for Maternal-Fetal Medicine:  
Health Policy and Advocacy Committee,  
PO Box 420016, Washington, DC 20042,  
USA.

Email: [pubs@smfm.org](mailto:pubs@smfm.org)

**Abstract**

The Society for Maternal-Fetal Medicine (SMFM) strongly supports using maternal mortality data to inform programs and interventions to reduce the high maternal mortality rate in the United States. In this Special Statement, SMFM outlines the three types of maternal mortality data used in the United States; provides an overview of the common US data sources; and offers considerations and best practices for understanding, comparing, and using the data.

**KEYWORDS**

best practices, maternal death, maternal mortality, maternal mortality data, maternal mortality rate, maternal mortality ratio, maternal mortality review committee, pregnancy checkbox, pregnancy-associated death, pregnancy-associated mortality, pregnancy-related death, pregnancy-related mortality, pregnancy-related mortality ratio

## 1 | INTRODUCTION

Despite being one of the world's wealthiest nations and its high spending on healthcare, the United States has one of the highest rates of maternal mortality among peer countries and significant disparities by age, race, ethnicity, socioeconomic status, and geographic region [1]. Collecting and thoroughly analyzing maternal mortality data is crucial to understanding the drivers of maternal deaths, developing data-driven interventions, improving health equity, and preventing future tragedies. However, the most common data sources vary in the information they collect and how it is collected, which can pose challenges to assessing and using the data to improve maternal health. To address this challenge, the Centers for Disease Control and Prevention (CDC) has created systems to enable consistent data collection across states, an important step toward improving the utility of the data.

In their efforts to advance maternal health and eliminate maternal health disparities, healthcare providers, policy-makers, advocates, and others should distinguish among the different sources of maternal mortality data, consider the purpose and content of each data source, and determine which data provide the appropriate type of evidence for their purpose. This Special Statement summarizes various data sources used in the United States and offers best practices recommended by the Society for Maternal-Fetal Medicine (SMFM) to aid in the appropriate use of maternal mortality data.

## 2 | DEFINITIONS

While US data sources are the primary focus of this statement, it is important to note that definitions of maternal mortality vary by country, complicating international

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**TABLE 1** Definitions of key mortality statistics [3–5].

Statistic	Definition
Maternal mortality rate <sup>a</sup>	The number of maternal deaths per 100,000 live births
Pregnancy-related mortality ratio	The number of pregnancy-related deaths per 100,000 live births
Pregnancy-associated mortality ratio	The number of pregnancy-associated deaths per 100,000 live births (both pregnancy-related and not pregnancy-related)

<sup>a</sup>Note that the World Health Organization distinguishes maternal mortality rate from ratio as follows [6]: “The maternal mortality *ratio* is defined as the number of maternal deaths during a given time period per 100,000 live births during the same time period. . . . The maternal mortality *rate* is defined and calculated as the number of maternal deaths divided by person-years lived by women of reproductive age in a population.” The CDC definition of maternal mortality rate is thus equivalent to the WHO definition of maternal mortality ratio.

comparisons. Specifically, the World Health Organization (WHO) identifies and classifies maternal deaths within 42 days of termination of pregnancy, while the CDC uses additional terms with definitions that extend up to 1 year after the end of a pregnancy, which ensures national data capture the nearly one third of deaths that occur between 43 and 365 days postpartum [2]. See the following definitions and Table 1 for more details.

- **Maternal death:** The death of a person while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes [3, 7].
- **Pregnancy-associated death:** The death of a person during or within 1 year of the end of pregnancy, regardless of cause [8].
- **Pregnancy-related death:** A death during pregnancy or within 1 year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the effects of pregnancy. In addition to having a temporal relationship to pregnancy, these deaths are causally related to pregnancy or its management [9].

Importantly, there is no term that refers to all types of mortality data described above. As such, when not referring to specific data, this Special Statement uses the term “maternal mortality” broadly, encompassing maternal deaths, pregnancy-related deaths, and pregnancy-associated deaths.

### 3 | OVERVIEW OF US DATA SOURCES

#### 3.1 | Maternal mortality review committees and the Maternal Mortality Review Information Application

Maternal mortality review committees (MMRCs) are convened by individual states or jurisdictions. These multidisciplinary committees review the medical and nonmedical factors, such as social drivers of health outcomes, for instances of pregnancy-associated death to determine whether that death was pregnancy-related. This information is then used to understand the range of contributing factors for each pregnancy-related death that is reviewed. MMRCs can review data sources beyond medical records—for example, by assessing social service records and conducting interviews with the decedent’s family or other close contacts to more fully understand the pregnancy-relatedness, cause, and contributors to the death.

MMRCs assess whether a pregnancy-related death was preventable—that is, whether there was at least some chance that the death could have been averted by reasonable changes to patient care or other elements, such as community, provider, facility, or systems factors [2]. MMRCs may use their findings to make recommendations to prevent future deaths.

Because of the depth and breadth of their process, MMRCs are the gold standard for identifying, reviewing, and making recommendations to reduce preventable pregnancy-related deaths. Of all the sources of maternal mortality data, only MMRCs assess whether deaths were preventable. However, the MMRC process is time- and resource-intensive, which can result in delays of 2 to 3 years or more from the time of death until the time findings are released via public reports [10].

MMRC reports detail their findings and put forward recommendations for their state or jurisdiction. Reports will typically include the jurisdiction’s overall pregnancy-related mortality ratio (PRMR). Some reports provide data on leading causes of death by race, ethnicity, and other social factors, such as insurance type or geographic location. Due to confidentiality concerns, MMRCs might need to draw on data from multiple years to publicly report their overall PRMR, as well as the PRMR for specific populations. When using MMRC data, it is important to be mindful of the years included in the report and used for specific disaggregated findings.

The CDC created the Maternal Mortality Review Information Application (MMRIA) data system to standardize and support data collection across MMRCs. Most, but not all, US states and territories contribute data from their

MMRCs to the CDC using MMRIA. MMRIA facilitates the collection of standardized data from states and allows for a near-national perspective. For example, a look at 2021 MMRIA data from 46 states confirmed the roles of obesity, discrimination, substance use disorders, and other mental health disorders in pregnancy-related deaths\* [11].

SMFM strongly supports MMRCs as a mechanism for comprehensive identification, review, and analysis of deaths during and within a year of pregnancy [12]. SMFM recommends that each state have an active MMRC that is adequately funded and authorized to collect and review comprehensive medical and family data and report timely findings and recommendations. A complete list of SMFM's recommended minimum standards for MMRCs can be found in the 2025 Society for Maternal-Fetal Medicine Position Statement: Maternal mortality review committees [12].

### 3.2 | National Vital Statistics System

The National Vital Statistics System (NVSS), part of the CDC's National Center for Health Statistics (NCHS), combines data from death certificates from all states on maternal deaths (deaths during or up to 42 days after pregnancy). These data provide a national overview of the maternal mortality rate that can be helpful in comparing the United States with other countries that use the WHO definitions of maternal death, maternal mortality ratio, or maternal mortality rate. NVSS data can be reported by maternal age and, to a limited extent, race and ethnicity [13]. Because the NVSS collects data only from death records, it can provide a national overview relatively quickly, but the accuracy depends on the accuracy of the death certificates themselves [10].

### 3.3 | Pregnancy Mortality Surveillance System

The CDC's Pregnancy Mortality Surveillance System (PMSS) analyzes data on pregnancy-related deaths (deaths during or up to 1 year after pregnancy) from all states and some US jurisdictions and territories. In addition to death records, it captures linked birth or fetal death records and can include other information, such as media reports and MMRC findings, all reviewed by medical epidemiologists [14]. The determination of pregnancy-relatedness "is based on the clinical cause of death, the interval between the

end of pregnancy and death, and the biologic processes of pregnancy complications" [14].

Because the PMSS draws on multiple sources, it is less dependent than the NVSS on the accurate completion of the pregnancy checkbox (see Section 4.1) and death certificate [10]. However, the PMSS process takes longer than the NVSS, so the data can be less current. Like the NVSS, the PMSS data can provide national insights about trends and some demographic data.

### 3.4 | Key distinctions among sources

Clearly, the data from the NVSS, the PMSS, and MMRCs cannot be compared directly, because they use different sources and definitions and serve different purposes. The NVSS and the PMSS do not fully characterize the circumstances of each death. NVSS data come solely from death certificates, which do not include enough detail to inform prevention strategies and do not include deaths between 43 days and 1 year postpartum. MMRCs look at medical and nonmedical factors to understand the range of contributing factors. They build on this information to make recommendations for their states and jurisdictions. Table 2 summarizes the attributes of data in NVSS, PMSS, and MMRC reports. (See "Identifying Deaths during and after Pregnancy: New Approaches to a Perennial Challenge" [10] for a more detailed table.)

## 4 | DATA QUALITY CONSIDERATIONS

### 4.1 | Maternal death reporting

To address documented underreporting of maternal deaths in the NVSS, starting in 2003, US death records began including a checkbox indicating whether the deceased was pregnant at the time of death, within 42 days of death, or between 43 days and 1 year before death. As of 2018, all states include the pregnancy checkbox. The NCHS notes that adding the checkbox "resulted in a significant and disruptive break in the comparability of data collected before and after the checkbox was added," so it does not recommend comparing maternal mortality NVSS data before and after the addition of the checkbox [3]. Furthermore, NCHS indicates, "Because maternal death information was not captured in a consistent way across states, NCHS does not recommend using NVSS data to examine trends in maternal deaths" during the transition period of 2003 to 2017 [3].

The CDC acknowledges that use of the pregnancy checkbox led to overreporting. For example, MacDorman and Declerq found that some deaths identified as maternal deaths via the checkbox occurred among women who were not pregnant or postpartum [16]. In response, the CDC

\* For current information on which states contribute MMRC data to the CDC through MMRIA, visit the CDC website at <https://www.cdc.gov/maternal-mortality/php/erase-mm/index.html>.

**TABLE 2** Maternal mortality data resources at a glance [15].

Data Sources at a Glance	NVSS	PMSS	MMRCs
Identifies deaths during pregnancy and up to 42 days after	X	X	X
Identifies deaths during pregnancy and up to 1 year after		X	X
Reviews maternal death certificates	X	X	X
Reviews fetal death and birth certificates		X	X
Reviews other sources such as medical records, social service records, autopsies, and informant interviews			X
Determines whether a death was preventable			X
Provides information at the national level	X	X	
Provides information on national disparities		X	
Highlights deaths at the state and local level			X
Identifies nonmedical contributing factors			X
Provides specific recommendations for prevention			X

Abbreviations: MMRCs, maternal mortality review committees; NVSS, National Vital Statistics System; PMSS, Pregnancy Mortality Surveillance System.

Source: Adapted from the Centers for Disease Control and Prevention [15].

has undertaken training and quality control initiatives to improve the accuracy of reporting. SMFM commends ongoing work to improve national maternal death surveillance systems and recommends that additional funding and technical assistance be directed to the effort.

## 4.2 | Limitations of MMRC findings

With the CDC's financial and technical assistance, states have improved MMRC review processes and expanded capacity to use committee findings to inform prevention. The CDC's Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) program, authorized by Congress in 2018 and reauthorized in February 2026, supports MMRCs in identifying, reviewing, and characterizing pregnancy-related deaths [17].

Since its creation, ERASE MM has supported states in standardizing maternal mortality review, implementing best practices, and reporting data to MMRIA. This critical support has increased understanding of the causes of pregnancy-related deaths and opportunities for prevention.

Some gaps in MMRC data persist that may affect interpretation. For example, Native and Indigenous people are often excluded from publicly reported data because of their relatively small numbers [18]. Similarly, states with small absolute numbers of deaths may be unable to disaggregate leading causes of death by factors such as race, ethnicity, or insurance status. Furthermore, there are variations in MMRC procedures and processes across states, including their authorities, access to records, and scope of cases reviewed. For instance, pregnancy-related deaths by homicide are not fully represented in the data reported by every

MMRC because not every MMRC reviews homicide cases [19]. Additionally, despite technical assistance from the CDC ERASE MM team, there is no national consensus on what criteria to use to identify the pregnancy-relatedness of suicide and unintentional overdose deaths [20]. As such, direct comparison of findings within MMRC reports across states should be approached with caution.

## 4.3 | Pregnancy-associated vs. pregnancy-related deaths

It is important to be aware of whether reported data focus on pregnancy-related or pregnancy-associated deaths and to avoid direct comparisons between the two. Both measures give important information about the state of maternal health in the United States, but there are key differences in how the data should be used.

Pregnancy-related deaths have been causally linked to pregnancy, and therefore the findings and any recommendations based on them can be targeted to meet the needs of pregnant people and their families. Focusing on pregnancy-related deaths allows maternal health stakeholders, including clinicians, public health professionals, payors, policymakers, and patients, to apply their expertise and resources in service of improving outcomes for pregnant and postpartum people.

In contrast, pregnancy-associated deaths incorporate deaths both related and unrelated to pregnancy, which poses two challenges. First, these data have the potential to overwhelm efforts to address maternal morbidity. For example, leading causes of pregnancy-related deaths such as preventable hemorrhage or infection may be overshadowed

owed when pooled with a large number of pregnancy-associated—but not pregnancy-related—deaths.

Second, findings and recommendations from analyses of pregnancy-associated deaths may go beyond the sphere of influence, expertise, and resources of maternal health stakeholders. Such recommendations are likely better targeted to a broader population and implemented by or in partnership with stakeholders outside of maternal health. For instance, recent studies have documented that homicide and suicide are leading causes of pregnancy-associated death in the United States [21–23]. Although some of these studies have shown that homicide and suicide are more frequent in pregnant people than nonpregnant people, they do not specifically analyze pregnancy-relatedness. As such, these findings on their own are not enough to inform development and drive implementation of evidence-based interventions for pregnant and postpartum people. However, maternal health stakeholders can play a role in, for example, initiatives that address unacceptably high rates of violent deaths in the United States.

MMRC findings and recommendations focused on pregnancy-related homicide—such as in the setting of intimate partner violence—and suicide deaths can inform specific interventions that maternal health stakeholders are best positioned and equipped to take to prevent future deaths. For instance, a 2024 North Carolina MMRC report analyzed suicide and homicide deaths, determined pregnancy-relatedness, and made multiple detailed recommendations to maternal health stakeholders for prevention [24].

## 5 | BEST PRACTICES FOR USING MATERNAL MORTALITY DATA

SMFM suggests the following best practices when using maternal mortality data:

- Determine the ultimate goal of the assessment and ensure that the data set selected suits the purpose.
- Always review the definitions used for a given study or data set. Definitions of maternal mortality and related concepts vary by source.
- Consider the purpose of the study or data set. For example, MMRCs operate at the state and jurisdictional level and use their data to generate recommendations to prevent pregnancy-related mortality and improve care that are targeted to that state or jurisdiction. The NVSS and the PMSS offer a broad, national view of maternal mortality and pregnancy-related mortality, respectively.
- Apply an equity lens when reviewing and interpreting maternal mortality data and strive to identify the

causes of and remedies for inequities in maternal health outcomes.

- Do not mix data sources when using maternal mortality data. If different sources must be used, it is critical to clearly highlight differing definitions and avoid making direct comparisons.
- Take into account that MMRCs are the only data source that integrates information from multiple outside sources and committee expertise to reliably determine the specific factors contributing to death and whether the death was preventable.
- For MMRC data, be mindful of which years are included in the reports, including any differences in years used to report disaggregated data.
- For NVSS data, do not compare maternal death data before and after 2003 and avoid examining trends in maternal deaths from 2003 to 2017.
- Consider gaps in the data that may affect interpretation.

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