Considering What Counts: The Fall and Rise of Maternal Mortality Rates

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Abstract

Twentieth-century medical advances reduced the rate of maternal mortality by more than 99 percent. Yet recently we hear that there has been a substantial increase in the maternal mortality rate. This increase has been caused by contemporary researchers adopting much broader definitions for what counts as cases of maternal mortality. This example illustrations the importance of definitions in shaping statistics.

Keywords

definition, maternal mortality, official statistics

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Cover Page Footnote

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Throughout history, giving birth was relatively dangerous; many women died in childbirth or soon afterward. Physicians understood this to be an important problem, and local leaders in the United States conducted studies in hopes of making childbirth safer. Because they wanted to measure and track just how frequent maternal mortality was, they had to define the phenomenon. That is, they wanted to be able to count some deaths as cases of maternal mortality, while not counting other deaths that were not instances of maternal mortality, in order to show the problem's extent, and how it ought to be addressed.

For these purposes, officials at the US Census decided to count cases where women died during childbirth or from the complications of childbirth that were considered caused by harm from the birthing process (such as hemorrhaging, infection, thrombosis/stroke, and reaction to anesthesia) during the six weeks (42 days) after giving birth. This period was termed "the puerperal state" (US Census 1922, 312, Table 8). This method of measuring maternal mortality became more-or-less standard, and each year researchers could examine death certificates, tally the number of cases that fit the definition, and then divide that number by the total number of live births. The initial calculations (made in the early years of the twentieth century), resulted in figures of around 850 maternal mortality deaths per 100,000 live births, that is, nearly one in every thousand pregnancies ended in the woman's death, with a national total of 16,320 "puerperal deaths" in 1920 (US Census 1922, 312; Centers for Disease Control 1999).

Driving down maternal mortality was one of the most impressive accomplishments of twentieth-century medicine according to counts developed by government agencies. By the 1980s, the rate in the United States had fallen more than 99 percent, down to 7.5 maternal deaths per 100,000 live births: "Environmental interventions, improvements in nutrition, advances in clinical medicine, improvements in access to health care, improvements in surveillance and monitoring of disease, increases in education levels, and improvements in standards of living contributed to this remarkable decline" (CDC 1999, 849).

These days, however, it has become common to encounter claims about disturbing increases in maternal mortality. For example, the Population Bulletin recently issued a report on young women's well-being that states, "Over the past several years, maternal mortality has risen sharply, with a rate of 30.4 maternal deaths per 100,000 live births as of 2020–2021, a rate higher than any other wealthy nation" (Srygley et al. 2023, 19).

How, you might well ask, is it possible that a problem that seemed to have been nearly eradicated 40 years ago now seems to be increasing? What's going on? The answer reminds us of the importance of making apples-to-apples comparisons. Whenever we compare things, we need to make sure that they are indeed comparable. In this case, if we want to determine whether the rate of maternal mortality has been rising or falling, we need to make sure that we are defining and

measuring maternal mortality in comparable ways. As we shall see, today's definitions of maternal mortality are very different from the one that guided medical researchers for most of the twentieth century. Today's researchers have been using increasingly broader definitions and, as a result, they are counting far more deaths as cases of maternal mortality.

When we try to count cases of maternal mortality, what counts (Stone 2020)? Remember that the standard definition during the twentieth century counted women who died during childbirth, or from complications of childbirth during the 42 days following giving birth. But in recent years, maternal mortality has been redefined in several ways, each of which broadens the definition, so that more deaths now qualify as cases of maternal mortality

First, the causes of death counted as instances of maternal mortality have expanded. Recent researchers have been willing to count any health-related causes (such as cancer and heart disease), as "pregnancy-related" maternal mortality (Shadigian and Bauer 2005) and unrelated to health causes as "pregnancy-associated" maternal mortality, such as deaths by accidents, suicide (Shadigian and Bauer 2005), drug overdoses (Hancock 2023; Han et al. 2024), COVID-19 (Matsuo et al. 2023), or homicide (Shadigian and Bauer 2005; Johnson 2013). Their argument is that pregnancy may have contributed to these deaths. Obviously, counting deaths from more causes will increase the statistics of maternal mortality.

Next, the time period during which deaths are counted has expanded. This development involves three issues. First, today's researchers count deaths during pregnancy (that is, before childbirth). While this may seem reasonable enough at first glance, pregnancy-related and pregnancy-associated deaths were not counted when researchers initially began studying maternal mortality. Obviously, every decision to count more deaths will result in more deaths being counted. Second, researchers began counting deaths during the weeks following the termination of a pregnancy, thereby including people who died (from any cause) after experiencing miscarriages or abortions (Shadigian and Bauer 2005). This expansion, again, increases the number of deaths eligible for counting. Third, it has become common for contemporary researchers to count deaths occurring more than six weeks after the pregnancy ends. Some researchers have counted deaths that occur within a year of childbirth; one study even counted deaths up to eight years after the birth (Shadigian and Bauer 2005). The broader the time period covered, of course, the more deaths will be counted.

Finally, the number of sources used to identify deaths has increased. In 2003, researchers recommended that all states add a checkbox to death certificates noting whether the deceased individual had been pregnant; this recommendation was intended to identify maternal deaths that might otherwise not have been spotted. Some states instituted this change more rapidly than others; it was not until 2017 that the last state adopted the checkbox (Davis et al. 2017).

It is important to appreciate how these changes have transformed the meaning of maternal mortality. For most of the twentieth century, concern focused on the medical dangers of childbirth, and there was tremendous progress toward nearly eradicating such deaths. Today, the definition of maternal mortality has been expanded beyond recognition. In some studies, maternal mortality is counted when an autopsy reveals a pregnancy—even in cases where the deceased was not aware of being pregnant (Shadigian and Bauer 2005). The reason that maternal mortality rates dropped precipitously during the twentieth century but have been rising in recent decades reflects changes in how researchers count cases.

The adoption of the pregnancy checkbox for death certificates alone has had a dramatic effect. The National Center for Health Statistics found that most of the apparent increase in maternal mortality was due to different states gradually adding the checkbox to death certificates:

> [U]sing more comparable data across states, NCHS found that the increase in maternal mortality in the United States is not likely due to a true increase in the underlying extent of maternal mortality. Rather, the majority of the observed increase in the MMR [maternal mortality rate] is attributed to changes in data collection methods (i.e., the gradual adoption of the checkbox). Based on the pre-2003 coding method, the MMR was 8.9 in 2002 . . . and 8.7 in 2018 (Joseph et al. 2021, 764).

Obviously, researchers should be able to choose what they study and how they define their concepts. But, when they compare statistics, either across time or among different nations, it is important to make sure that the figures from different years or different places are comparable—that they've used the same definitions and measures, so that apples are being compared to apples. In particular, when researchers report having identified alarming trends, we need to be alert to just what those definitions might be and how they may have changed over time.

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