Kentucky Department for Public Health

Maternal Mortality Review

2022 Report

Our mission is to improve the health and safety of people in Kentucky through prevention, promotion, and protection.

Kentucky Public Health

Prevent. Promote. Protect.

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The Maternal Mortality Report in Kentucky Annual Report is prepared by the Division of Maternal and Child Health, within the Kentucky Department for Public Health, under Commissioner Dr. Steven Stack. This report was made possible by the many individuals who contributed their time and efforts toward the prevention of MMR. Although this report emphasizes the maternal deaths within the 2019 cohort, the most up to date data available through 2020 is provided in respective sections.

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Questions concerning this report should be directed to:
Public Health Maternal Mortality Review
Kentucky Department for Public Health
275 East Main Street, HS2WA
Frankfort, KY 40621

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Executive Summary

Maternal mortality is a key indicator of a state's health and has a long-term impact on other related health factors, such as infant mortality. Given the rise of maternal mortality within the United States, it is pertinent to track and implement means to reduce maternal mortality rates. To reduce mortality, Kentucky is promoting optimal health before, during, and after pregnancy. This includes addressing healthy nutrition, chronic health conditions, substance use, health equity, social determinants of health, prenatal care, and early elective deliveries. **All maternal deaths during pregnancy and within 365 days from the end of pregnancy are reviewed by the Maternal Mortality Review Committee.** The current Centers for Disease Control and Prevention (CDC) standard for "maternal deaths" only includes those with pregnancy-related causes.

Key Findings for 2019 Cohort

- 20% of maternal deaths were pregnancy-related deaths, and the rate of pregnancy-related mortality was 16.9 deaths per 100,000 live births.
- The rate of maternal deaths from all causes was 115.1 per 100,000 live births.
- 54% of all maternal mortality cases had substance use disorder linked to their death.
- 89% of maternal mortality cases were deemed to be preventable.

Key Recommendations

Prenatal and pregnancy

- Kentucky Department for Public Health will provide education and promote well woman and peri-conceptional care.
- Facilities should incorporate suicide and depression screening into emergency room visits.
- Clinicians should prescribe the minimal amount necessary of post-operative narcotics for cesarean section deliveries.
- Clinicians should follow-up on patients with multiple missed behavioral health appointments.
- Clinicians and facilities should provide a follow up appointment rather than expecting the patient to call in for a follow-up appointment.

Post-delivery

- Clinicians and facilities should establish guidelines for mothers with or without prenatal care with coordinated referral among primary physician, obstetric provider, substance use disorder specialist, and infant's provider, with follow-up and plan of safe care for the infant.
- Facilities should provide comprehensive screening for depression at discharge.
- Clinicians should follow up with patients who have a history of substance use disorder within the first three months after delivery.

General safety

- Clinicians and/or facilities should document post-mortem toxicology and seatbelt usage for all those involved in motor vehicle accidents.
- Law enforcement should request/access autopsy findings when conducting a death investigation when one of the accident victims is pregnant or within one year postpartum.
- Kentucky Department of Corrections should develop substance use disorder counseling for incarcerated pregnant women along with prenatal care upon release.

Background

Maternal health and its importance

To reduce the maternal mortality rate and improve the health of the state, the first step is to identify those women whose death occurred during pregnancy or within one year of the end of the pregnancy from:

- Pregnancy-related death: Death of a woman during pregnancy or within one year of the end of the pregnancy, from a pregnancy complication, a chain of events initiated by a pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.
- Pregnancy-associated death: A death during or within one year of pregnancy regardless of the cause.
- Pregnancy-associated, but not related death: A death during or within one year of pregnancy from a cause that is not related to pregnancy.

The World Health Organization defines maternal death or mortality as "the death of a woman 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." The Centers for Disease Control and Prevention (CDC) expanded this definition to include pregnancy-related deaths occurring within one year of the end of the pregnancy. Kentucky further expanded the CDC definition to include all maternal deaths from any cause for its maternal mortality reviews.

Disparities in Kentucky vary by geography, race, ethnicity, and access to care. Kentucky's population is 87.1% White/Caucasian, 8.6% Black/African American, and 4.2% Hispanic (U.S. Census Bureau, 2021). Death certificates show maternal deaths appear to be higher among Black women in the two largest urban areas in Kentucky (Lexington and Louisville).

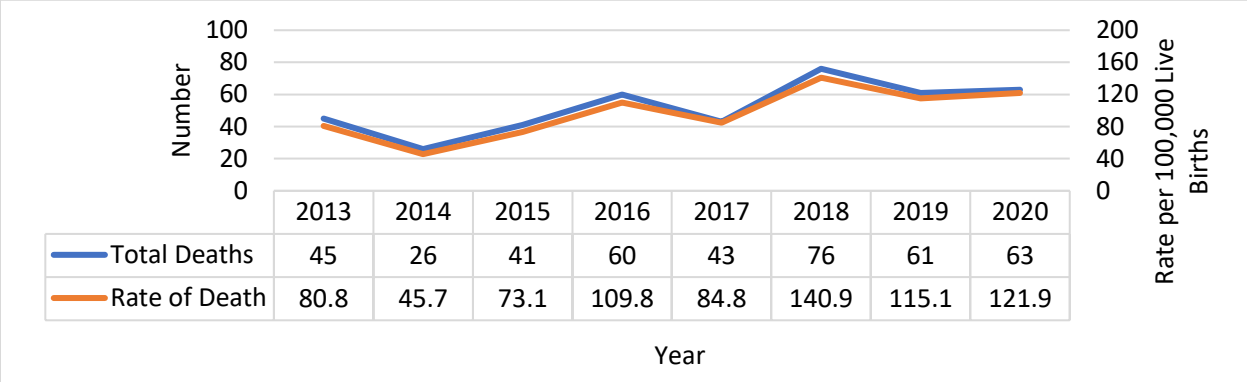
The 2020 pregnancy-related maternal mortality rate in the U.S. was 23.8 deaths per 100,000 live births. That represents a significant increase as the 2019 rate was 20.1 per 100,000 live births (National Center for Health Statistics). Almost half of all pregnancy-related deaths are reported to be caused by hemorrhage, cardiovascular and coronary conditions, cardiomyopathy, or infection. However, it is estimated more than 60% of pregnancy-related deaths are preventable.

Maternal mortality from vital statistic records

The importance of Kentucky's maternal health and wellbeing has a significant impact on the overall health of the state. Risk factors impacting maternal mortality include tobacco use, obesity, racial disparities, depression, substance use, and other social determinants of health, such as transportation, access to care, domestic violence, and a rural state. Morbidities, such as diabetes, hypertension, or other health conditions, require additional follow up and management during the pregnancy.

Figure 1 displays the finite count of all maternal deaths of those pregnant within one year before their death or pregnant at the time of death and the number of maternal deaths per 100,000 live births within Kentucky using Kentucky death certificate data. This figure both display data by their respective years from 2013 to 2020 and is inclusive of any cause of death.

Figure 1: Total Number of Maternal* Deaths and Rate of Death From All Causes; Kentucky, 2013-2020



	2013	2014	2015	2016	2017	2018	2019	2020
Total Deaths	45	26	41	60	43	76	61	63
Rate of Death	80.8	45.7	73.1	109.8	84.8	140.9	115.1	121.9

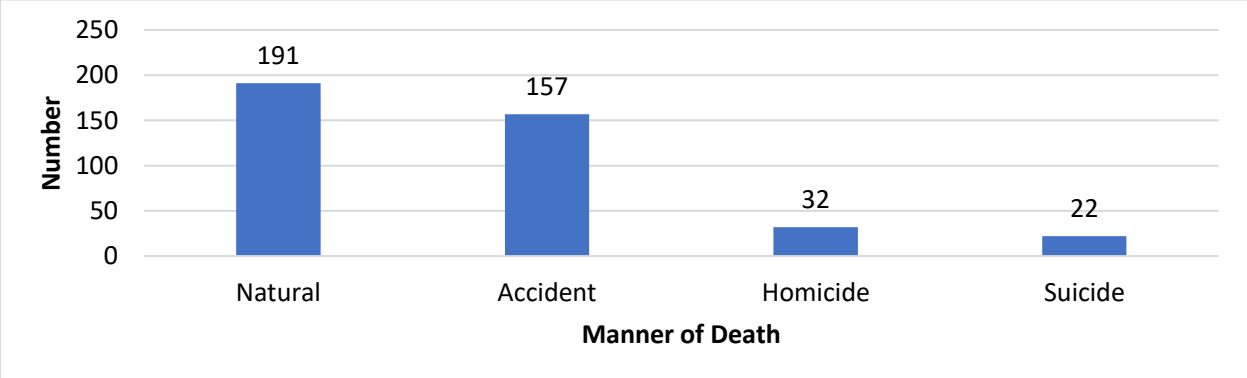
*Maternal death is defined as any female between the ages of 15-55 that was pregnant within one year prior to death or pregnant at death and died from any cause. The 2016-2020 data is preliminary, and numbers may change.

Data Sources: KY Vital Statistics files, linked live birth, and death certificate files years 2013-2020.

On the death certificate, the manner of death is defined as natural, accidental, homicide, suicide, or undetermined. Figure 2 shows the total number of maternal deaths based on the manner of death. Natural deaths include any death occurring because of disease or a natural process. Accidental deaths are categorized as resulting from an inadvertent event. Homicide deaths are considered to occur due to the action of another party directly causing the death of a person. Suicide deaths are from self-inflicted injury with evidence of intent to die. Outside of these criteria are undetermined deaths for which very little information is available and no other classification is possible.

In Kentucky, suicide deaths require clear evidence of intent, such as a history of suicidal ideation documented in a note. A concern identified in Kentucky maternal mortality reviews is that some overdose deaths listed as accidental may have been suicide attempts. This represents a limitation to some of the categorizations of Kentucky maternal deaths. Risk factors, such as depression, other mental health disorders, or domestic violence for deaths not pregnancy-related or associated, have been noted during the abstraction of these cases for reference. Many death certificates have causes of death consistent with substance use or infected injection sites based on the International Classification of Diseases 10 (ICD-10) revision. Those accidental deaths that have met the classification of being accidental and related to substance overdose are noted within Figure 3.

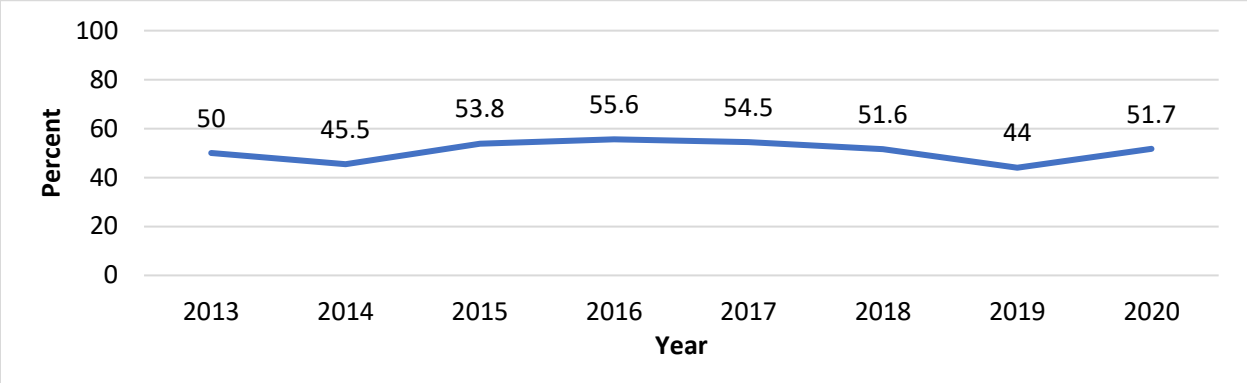
Figure 2: Total Number of Maternal* Deaths by Manner of Death; Kentucky, 2013-2020 Combined



*Maternal death is defined as any female between the ages of 15-55 that was pregnant within one year prior to death or pregnant at death and died from any cause. The 2016-2020 data is preliminary, and numbers may

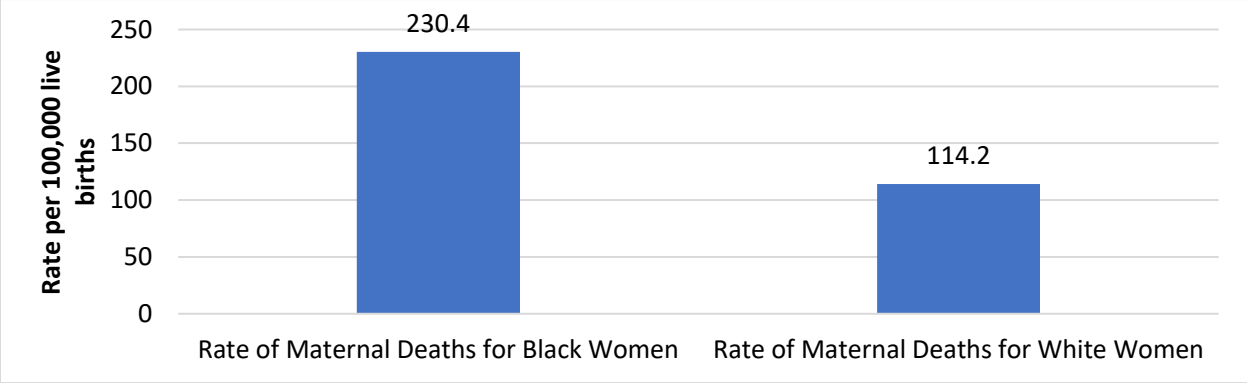
change.
Data Source: KY Vital Statistics files, linked live birth, and death certificate files years 2013-2020.

Figure 3: Percent of Accidental Maternal Deaths due to Drug Overdose, Kentucky, 2013-2020



*Maternal death is defined as any female between the ages of 15-55 that was pregnant within one year prior to death or pregnant at death and died from any cause. Drug overdose is defined by the ICD-10 code X40-X49. The 2016-2020 data is preliminary, and numbers may change.
Data Source: KY Vital Statistics files, linked live birth, and death certificate files years 2013-2020.

Figure 4: Difference in Maternal Deaths From Any Cause by Race, 2020



Maternal Mortality Review Assessment and Strategic Plans

The mission of maternal mortality review is to:

- Identify all causes of maternal death in Kentucky.
- Review cause and manner of maternal deaths to identify risk factors, system deficits, or preventable causes.
- Prevent pregnancy complications related to or associated with maternal deaths.

The Maternal Mortality Review Committee (MMRC) meets to determine program process and planning with the analysis of available data and technical assistance from the CDC. This involves identification of maternal deaths during or within one year of pregnancy, case selection for abstraction and potential recommendations.

The MMRC works to answer a variety of questions including the following core questions:

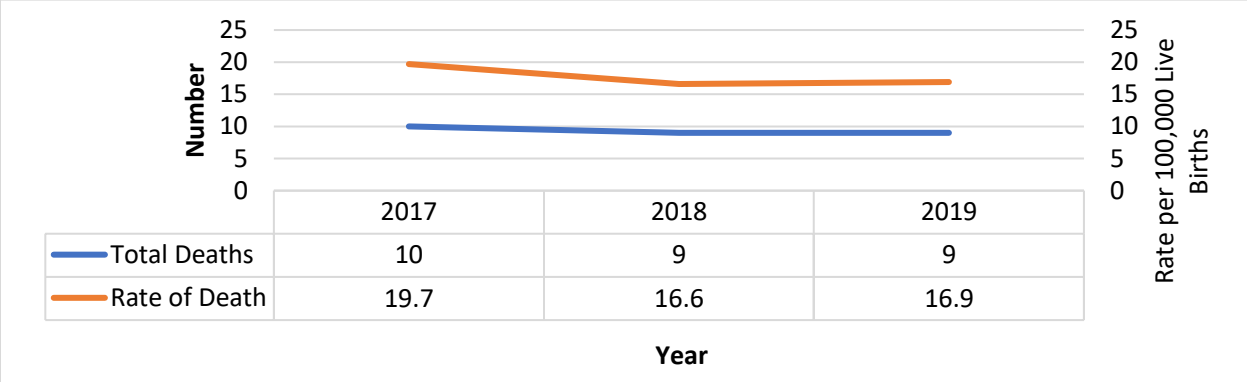
- Was the death pregnancy related?
- What was the cause of the death?
- What factors contributed to the death?
- Was the death preventable?

- What recommendations and actions are needed to address the contributing factors?
- What is the anticipated impact if the recommendations and actions were implemented?

Review Findings for 2019 cohort

Using established review criteria, the Division of Maternal and Child Health determined more than one in five of the 2019 maternal deaths in Kentucky were pregnancy related. Those deaths were due in part to pregnancy-associated causes, such as preeclampsia, embolism, sepsis, and hemorrhaging. As the CDC definition for maternal deaths includes only pregnancy-related deaths, Figure 5 illustrates the total number and the rate of pregnancy-related deaths as reviewed by the MMRC for 2017 to 2019. **The 2019 pregnancy-related mortality rate for Kentucky's MMRC has decreased since 2017 and is at 16.9 per 100,000 live births, slightly lower than the 2019 U.S. rate of 20.1 per 100,000 live births**.

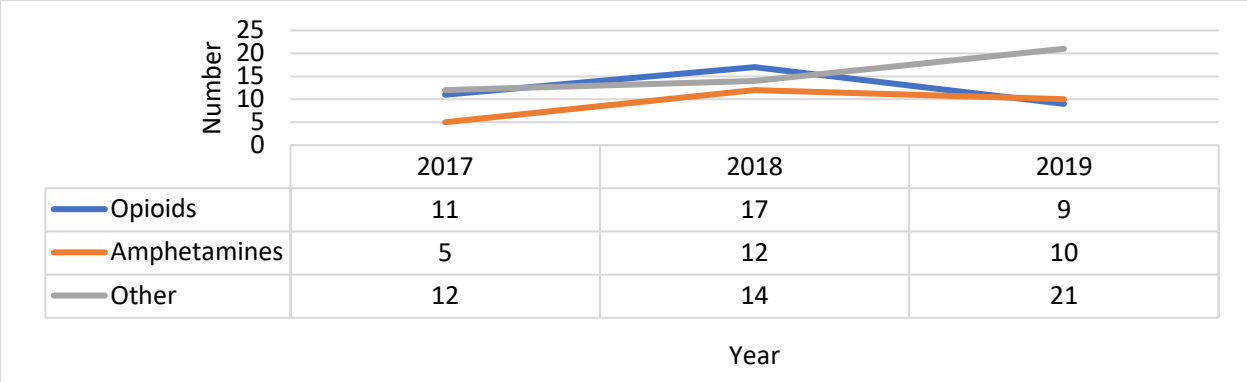
Figure 5: Total Number of MMRC Pregnancy-Related Deaths and Rate of Deaths; Kentucky, 2017-2019



The MMRC determines agreement with the coroner's cause of death. The committee agreed with the cause of death for 95% of reviewed cases. Differences between committee determinations and coroner determinations are typically related to availability of information and medical records. The coroner's determination may have been based on limited information if the decedent had multiple providers in different facilities or jurisdictions in Kentucky or surrounding states. Abstraction of medical records and review of individual cases by the committee is necessary to confirm the causes of death based on all available details.

The committee found that in more than half of 2019 cases reviewed, substance abuse contributed to the death. More specifically, opioid and methamphetamine use where it contributed to maternal death is displayed within Figure 6 of the 2017-2019 cohort comparison data. The number of maternal deaths attributed to substance abuse strengthen the need to address its impact before or during early pregnancy and the need for ongoing care management after delivery.

Figure 6: Patient substance use when it contributed to maternal death, 2017-2019



It is beneficial to learn if early identification and treatment for substance use have been undertaken for mothers throughout Kentucky. If depression screening was completed, it is necessary to understand if women were subsequently referred to community services that could help prevent accidental death. Psychosocial and environmental risk factors associated with maternal health conditions, such as social inequality, lack of access, homelessness, chronic disease management, substance use, and food insecurity, are pertinent to address. These factors impact a person's mental health and are continually being considered during the review process.

The MMRC has encouraged better understanding through follow up of pregnant women who are enrolled in treatment programs. Many women return to previous patterns of substance use without understanding that their tolerance to substances is lowered after pregnancy. Another major issue is the continuity of care in providing support to these mothers post-delivery, considering the comorbidities, such as depression and traumatic stress, are experienced when they lose custody of their newborn infant. An existing barrier to this is financial stability, although to date, the only information available on this is maternal health coverage. The 2019 cohort of mothers presented with 37 (84%) mothers with Medicaid coverage.

Evaluation

A great challenge posed during abstraction is obtaining records for review. The treatment provider location of the birth or end of pregnancy is often not where prenatal care or treatment for substance use or other health issues occurs. Abstractors spend a substantial amount of time researching many data sources (e.g., Medicaid claims data, hospital data, death certificate information, and pregnancy linked birth certificate to verify that delivery occurred). Abstractors may need to call healthcare providers for additional information. Reviews are greatly impacted by the availability and amount of information for review with 84% of cases in the 2019 cohort having complete records.

Overall, 89% of the maternal deaths reviewed from the 2019 cohort were considered preventable. This is higher than the CDC predicted average that 60% of maternal deaths in the United States are preventable. It is important for Kentucky to continue reviewing maternal deaths, providing meaningful recommendations, and actionable interventions to prevent these outcomes.