Issue Brief

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Maternal Mortality in Kentucky

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The United States (U.S.) has the highest rate of maternal mortality in the developed world, despite spending significantly more on healthcare than other developed countries.[1] The purpose of this research brief is to define maternal mortality, explore its root causes, and describe the state of maternal mortality in Kentucky, including how research and policy might support a more robust response in the Commonwealth.

DEFINING AND MEASURING MATERNAL MORTALITY

Measuring maternal mortality is complex and multi-faceted. There are three widely used definitions that characterize maternal mortality, and their application is highly variable (Table 1). Clear definitions are necessary to accurately report, analyze, and interpret data, and to appropriately compare data across different groups and geographies. In this research brief, we use terminology as defined in Table 1, unless otherwise noted. To the extent possible, we use the definition of maternal death that is implemented by the Kentucky Maternal Mortality Review Committee (MMRC) when describing Commonwealth specific data.

Table 1. Key Definitions of Maternal Mortality

Term	Source	Definition
Maternal mortality	Centers for Disease Control and Prevention (CDC)	The death of a woman during pregnancy, at delivery, or soon after delivery
Maternal death	World Health Organization (WHO)	Deaths during pregnancy or within 42 days postpartum that are related to pregnancy, irrespective of the duration and site of the pregnancy or its management but not from accidental or incidental causes
Pregnancy-related mortality	CDC	Death during pregnancy or within 1 year of the end of the pregnancy from any cause related to or aggravated by the pregnancy
Maternal death	Kentucky MMRC	Any Kentucky resident female between the ages of 15-55 whose death occurred within one year of the end of pregnancy from any cause

Sources: Centers for Disease Control and Prevention[2], World Health Organization[3], Kentucky Maternal Mortality Review 2020 Annual Report[4]

BACKGROUND

Maternal mortality has increased in the U.S. over the last two decades, reaching 17.4 deaths per 100,000 live births in 2018.[5] Annually, there are approximately 700 pregnancy-related deaths in the U.S., 60% of which are preventable.[6] Non-Hispanic Black women are more than three times as likely to die during pregnancy or in the year after delivering a baby as compared to White women.[7] The causes of racial disparities in maternal mortality are complex and related to systemic and structural barriers, such as implicit bias and racism, as well as barriers in accessing healthcare services. Research has shown that racial disparities persist, even when Black women have access to early prenatal care.[8,9]

To understand root causes of maternal mortality and identify strategies for prevention, it is critical to know when mortality is most likely to occur. In 2019, the CDC released a report of pregnancy-related deaths from 2011-2015. During that time, there were 3,410 maternal mortalities, of which the timing of death was known for 87.7%. Figures 1 and 2 summarize the timing and most common causes of maternal mortality in the U.S. between 2011-2015.[10]

Figure 1. Timing of Maternal Mortality in the U.S., 2011-2015

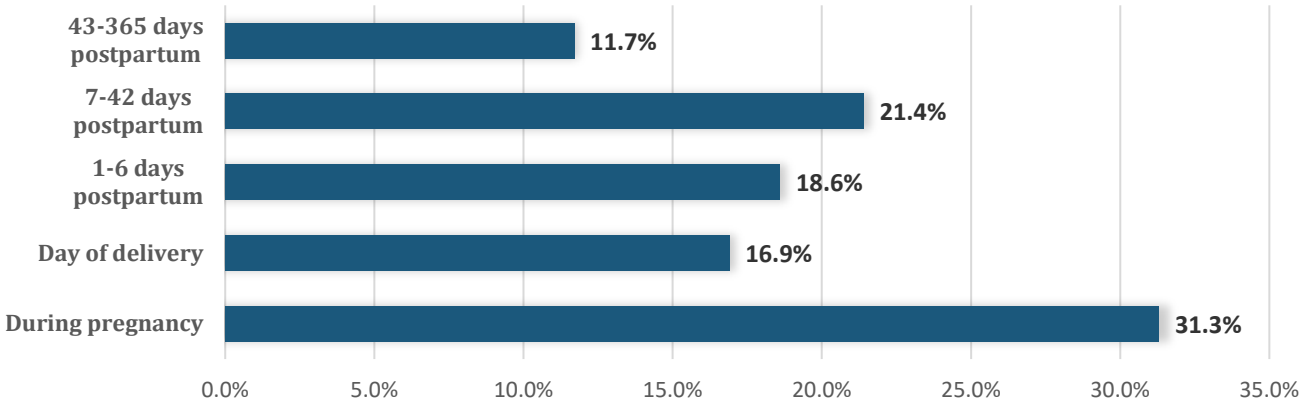
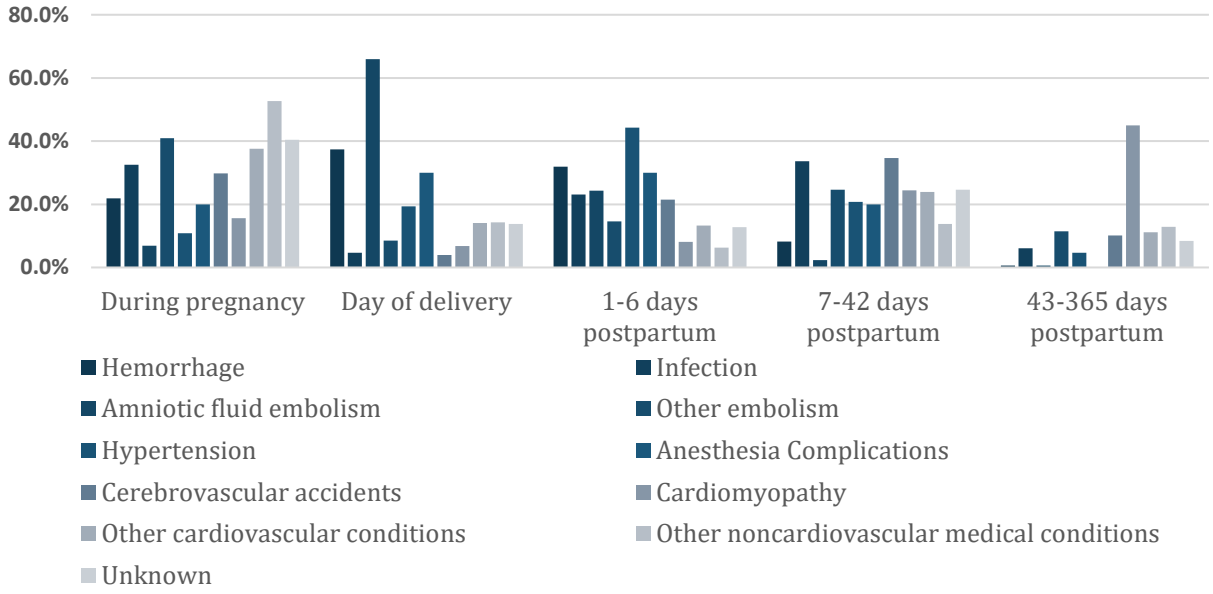


Figure 2. Most Common Causes of Maternal Mortality in the U.S., by Timing, 2011-2015



Among Black women, the leading causes of mortality are cardiovascular conditions, cardiomyopathy, and hypertensive disorders (e.g., preeclampsia). An analysis of 2016-2017 national death certificate data found that non-Hispanic Black women were five times more likely to die of preeclampsia, eclampsia, and postpartum cardiomyopathy and 2.3 times more likely to die of obstetric embolism and hemorrhage as compared to White women.[11]

THE ROLE OF SOCIAL DETERMINANTS OF HEALTH

Social determinants of health (SDOH) are the conditions in which people are born, grow, live, work, and age (Figure 3).[12] While much attention has been given to healthcare related determinants of maternal mortality, there is substantial evidence of the impact of structural determinants, including systemic racism, implicit bias in healthcare settings, education, insurance status, and healthcare access and quality, among others.[13]

Figure 3. Social Determinants of Health

Source: Healthy People 2030[15]

A growing body of literature indicates that racism, not race, is a significant contributor to maternal mortality.[14] Structural and systemic factors including racist policies that limit access to financial resources such as credit and loans in certain geographic areas (a.k.a. "redlining") contribute to racial disparities in maternal mortality and morbidity. Researchers have found associations between historically redlined zip codes in the U.S. and adverse maternal outcomes, including mortality, even after adjusting for other socioeconomic factors.[16] Implicit and explicit biases in healthcare settings can impact the outcomes that women of color experience during pregnancy and in the postpartum period. A substantial body of evidence documents that White medical providers hold negative implicit and explicit biases and stereotypes that influence clinical decision-making in encounters with Black patients.[17] Biases may impact patient-provider interactions, treatment decisions, access to care, and health outcomes. One survey found that, among 2,700 women who had given birth in a hospital setting, one-third of women of color reported being mistreated by medical staff, as compared to one-sixth of White women. While there is some evidence to suggest that patients in racially concordant relationships are more satisfied with their care and patient-provider communication, this literature is sparse due to the lack of obstetricians and midwives of color.[18]

Other SDOH, such as access to quality education, are associated with positive maternal outcomes. Increasing levels of education may facilitate a better understanding of health information, ability to navigate complexity in the health care system, and an increased ability to self-advocate when making medical decisions.[19] Education may also address income inequality, which has been associated with higher levels of pregnancy-related mortality among Black, but not White, women.[20] It is important to note that racial disparities in maternal mortality persist regardless of socioeconomic status and education. For instance, Black women with college degrees are five times more likely to have a pregnancy-related mortality as compared to White women with similar education.[21]

MATERNAL MORTALITY IN KENTUCKY

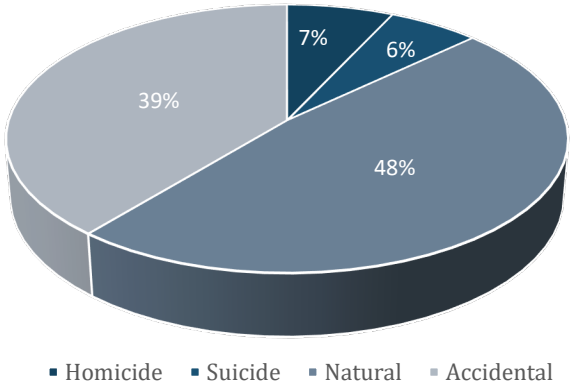
In 2018, Kentucky's maternal mortality rate was 40.8 per 100,000 live births. This is significantly higher than the national rate of 17.4.[22]

The Kentucky Maternal Mortality Review Committee (MMRC) meets regularly to review causes of maternal deaths in the Commonwealth and make recommendations to improve the system of care for pregnant and postpartum women. The MMRC uses an expanded definition of maternal mortality in their review (Table 1) to include 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 MMRC uses death certificate data to categorize cause of maternal death as natural, accidental, homicide, or suicide. A significant contributor to maternal deaths in Kentucky is substance use, which is categorized as "accidental." Substance use was the cause of 54.5% and 51.6% of accidental maternal mortalities in 2017 and 2018, respectively.

Kentucky data reflects national trends in substance use related deaths in the general population, largely attributed to accidental opioid overdose.[24] In 2017, the Kentucky MMRC found that mental health conditions, including depression, were a contributing factor in 39% of maternal deaths and a probable contributor in 15% of deaths.[25] Clinical and non-clinical strategies to address SDOH can support the behavioral health needs of women before, during, and after pregnancy. This might include screening and treatment for substance use disorder, referrals for perinatal mood and anxiety disorders (PMAD), identification of needs related to housing, food insecurity, and other factors for improving maternal health outcomes.[26]

Figure 4. Causes of Maternal Death, Kentucky, 2013-2018, Combined



Natural	Any death due to disease or natural process
Accidental	Deaths due to an inadvertent event
Homicide	Death due to the action of another party causing death
Suicide	Self-inflicted injury with evidence of intent to die

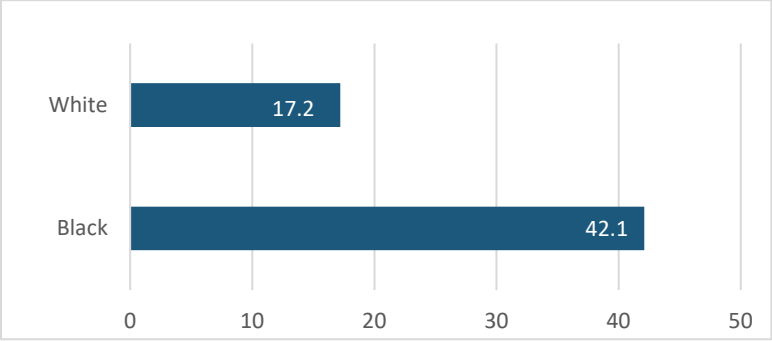
Source: Kentucky Maternal Mortality Review Committee Annual Report, 2020[23]

There is evidence of significant racial disparities in maternal mortality in Kentucky, reflecting national trends. While Black individuals comprise only 8% of the total population of the state, they are disproportionally impacted by maternal mortality with a rate more than double that of White Kentuckians.

"Black women in Louisville and Lexington experience high rates of maternal mortality despite the availability of advanced maternal care in urban cores of the state."

~Kentucky Maternal Mortality Review Committee Annual Report, 2020

Figure 5. Maternal Death Rate (per 100,000 births), by Race, Kentucky, 2018



Source: Kentucky Maternal Mortality Review Committee 2020 Annual Report[27]

National data points to stark racial disparities in rural communities, a particular concern in Kentucky given the geographic context. One national study found that Black women in rural areas experienced a rate of maternal mortality of 59.3 deaths per 100,000 live births, compared with 19.7 deaths per 100,000 live births among non-Hispanic white women. Additionally, between 2011-2016, pregnancy-related mortality was 14.6 deaths per 100,000 live births in large metropolitan areas, compared to 23.8 deaths per 100,000 live births in rural counties.[28]

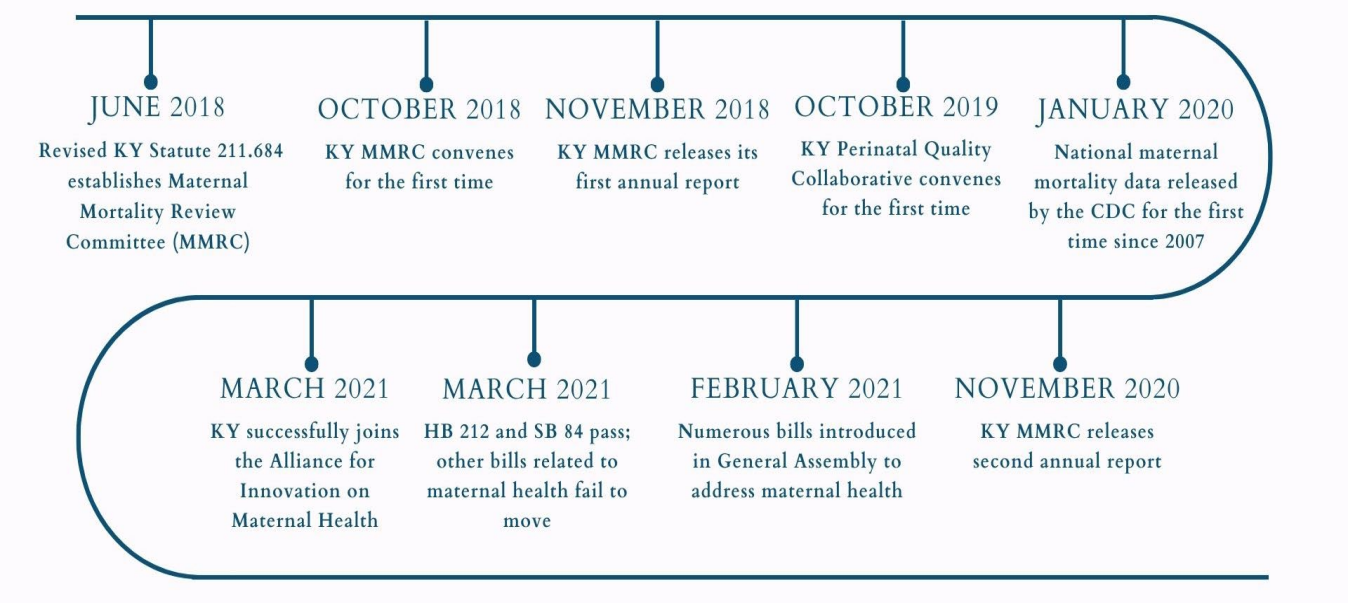
In 2017, 78% of maternal deaths in Kentucky were identified as preventable, compared to 60% at the national level[29,30]

Rural areas are susceptible to maternity care shortages. A maternity care desert is a geography that has no hospital or birthing center offering obstetric care and there are zero obstetric providers per 10,000 births. Approximately 50% of Kentucky counties are considered maternity care deserts.[31] Since 2005, a trend of rural hospital closures has occurred across the country, particularly concentrated in non-Medicaid expansion states. Medicaid expansion has been associated with improved hospital financial performance and reductions in the likelihood of rural hospital closure.[32] Nonetheless, a hospital with labor and delivery services located in Eastern Kentucky closed in January 2020.[33] The closure of rural obstetric units across the country, and in Kentucky, further risk maternal health.[34]

WHAT IS KENTUCKY DOING TO ADDRESS MATERNAL MORTALITY?

Kentucky has recently implemented practice and policy solutions to address high rates of maternal mortality in the Commonwealth, including establishing and convening the MMRC, and launching the Kentucky Perinatal Quality Collaborative (KY PQC). Maternal mortality related bills have also been introduced into the Kentucky General Assembly, with only a small number passing into law. Figure 6 provides an overview of key events related to maternal mortality in Kentucky since 2018.

Figure 6. Key Events Addressing Maternal Mortality in Kentucky



KENTUCKY MATERNAL MORTALITY REVIEW COMMITTEE

The purpose of a MMRC is to determine cause of maternal death and identify opportunities for preventing future deaths, including the development of policy and practice recommendations.[35] To thoroughly investigate the root cause of a maternal death, MMRCs must have access to relevant data, including legal documents, autopsy reports, and death certificates. To ensure confidentiality of data and the mortality review process, and to protect health care providers from liability and potential subpoenas, most MMRCs have legal protections in place. These legal protections are typically codified in state legislation and/or regulation.[36,37]

MMRCs are multi-disciplinary committees that convene to thoroughly review deaths of women during or within one year of pregnancy

In the fall of 2017, the Kentucky Division of Maternal and Child Health (MCH) initiated updates to its existing maternal mortality review process. Historically, maternal mortality reviews in the state were conducted informally through contracts with local universities to identify trends or patterns in maternal deaths. Deaths of women ages 12-50 years who had been pregnant in the last 12 months prior to death were reviewed through this process. Pregnancy-associated cases, including deaths from homicide, suicide, motor vehicle collision, or overdose, were excluded from review. Additionally, no formal, publicly available reports were published or required for dissemination.[38]

In 2017, the Kentucky Division of MCH formed a Maternal Mortality Advisory Team (Team) to review the existing maternal mortality review process and engage in technical assistance with the Centers for Disease Control and Prevention (CDC) to ensure any revised maternal mortality review process was aligned with best practices and national reporting goals. The Team identified that increasing rates of suicide, homicide, and overdose necessitated a broader review of maternal deaths (up to one year after pregnancy and with the inclusion of pregnancy-associated deaths), a standardized and more consistent framework for mortality reviews, and a multi-disciplinary review team to investigate maternal deaths in the state. The outcome of the Team was the recommendation of a more formal review committee.[39] In June 2018, the Kentucky legislature revised statute 211.684 to establish the Kentucky MMRC and require that the committee prepare a publicly available annual report on the incidence and causes of maternal mortality in the Commonwealth.[40]

The current Kentucky MMRC consists of approximately thirty members and meets every two to three months. The MMRC's mission is to identify and review all deaths that meet the MMRC case definition of maternal death and develop recommendations to address maternal mortality. The Committee conducts its review processes in alignment with recommendations from the Centers for Disease Control and Prevention (CDC), American College of Obstetricians and Gynecologists (ACOG), and the Association of Maternal and Child Health Programs (AMCHP).[41]

One of the key strengths of the MMRC is its multi-disciplinary membership, which was intentionally designed to support the ability of the committee to recommend and implement changes at the systems level. The Kentucky MMRC released annual reports in 2019 and 2020, both of which include actions to improve maternal health in Kentucky.[42,43]

Data and recommendations from the MMRC are utilized by the Kentucky Perinatal Quality Collaborative to formally design and implement change at the local and systems levels.

KENTUCKY PERINATAL QUALITY COLLABORATIVE

The Kentucky Perinatal Quality Collaborative (KyPQC) is a statewide network of birthing hospitals and other key stakeholders collaborating to improve the quality of care during pregnancy, delivery and throughout the first year of life.[44] It was launched within the Department of Public Health in October 2019 with the goal of improving maternal and infant health outcomes in Kentucky and, more specifically, to reduce maternal mortality and neonatal abstinence syndrome.[45] The collaborative is funded by a grant from the CDC.

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

The infrastructure of the MMRC and KyPQC allowed Kentucky to successfully apply for and join the Alliance for Innovation on Maternal Health (AIM) in March 2021. AIM, a joint agreement between the American College of Obstetricians and Gynecologists and the Health and Resources Services Administration Maternal Child Health Bureau, is a national data-driven maternal safety and quality improvement initiative to reduce preventable maternal mortality and severe morbidity. AIM aligns national, state, and hospital level quality improvement efforts to improve maternal health outcomes.[46]

AIM has developed evidence-based patient safety bundles designed to reduce preventable maternal morbidity and mortality. Primary bundles are:[47]

- Obstetric care for women with opioid use disorder
- Obstetric hemorrhage
- Safe reduction of primary cesarean birth
- Severe hypertension in pregnancy
- Cardiac conditions in obstetrical care
- Postpartum discharge transition
- Care for pregnant and postpartum people with substance use disorder

Because substance use disorder is a significant driver of maternal mortality in Kentucky, the KyPQC has chosen to begin their efforts with the implementation of the substance use disorder bundle.

NATIONAL MIDWIFERY LEARNING COLLABORATIVE

Kentucky was selected as one of five states to participate in a three-year learning collaborative convened by the Institute for Medicaid Innovation. The learning collaborative, which began in September 2021, is an opportunity for diverse stakeholders to collaborate to identify and advance midwifery-led models of care to reduce maternal health disparities.[48] A literature review concluded that midwife-led maternity care resulted in lower rates of cesarean section and lower rates of preterm births than other maternity models.[49]

KEY LEGISLATIVE ACTIONS TO ADDRESS MATERNAL MORTALITY

In 2021, numerous bills related to maternal health were introduced into the Regular Session of the General Assembly. These bills focused on key topics related to maternal mortality, such as Medicaid coverage of doula services (HB 266), implicit bias training for perinatal health providers (HB 27), extending Medicaid coverage from 60 days to one year postpartum for behavioral health services (HB 283), increasing access to midwifery and doula services for incarcerated women (HB 285), requirements for hospitals and birthing centers to provide information and resources regarding maternal depression to maternal patients (HB 294), making pregnancy a qualifying event for health insurance coverage (HB 299), requiring a more detailed demographic analysis of maternal and child mortality data (HB 212), and a Senate bill (SB84) requiring that incarcerated pregnant people receive 6 weeks of postpartum care, ending solitary confinement during pregnancy and postpartum, providing social workers to work with

pregnant people, and expanding pregnancy medical release to include community-based treatment options.

With the exception of HB 212, which was sponsored by House Republicans Samara Heavrin and C. Ed Massey, no bills introduced in the House were passed during the 2021 legislative session. In the Senate, SB 84 passed and was signed by the Governor in March 2021 with bi-partisan support.
HB 290, introduced into the House in February 2021, would have required the Department for Medicaid Services or the Cabinet for Health and Family Services to seek a federal waiver to extend postpartum Medicaid coverage. This bill was related to provisions under the American Rescue Plan Act of 2021 that allows states to expand postpartum Medicaid coverage up to 12 months through a state plan amendment. States must do so through a section 1115 waiver or by using state funds.[50] HB 290 was not referred to a committee in the 2021 legislative session.

In December 2021, the Department of Health and Human Services issued guidance to states interested in expanding Medicaid coverage to women for up to one year postpartum.[51] An accompanying issue brief detailed the implications of expanding coverage and found that gains in postpartum eligibility would be largest for those whose incomes are between 138%-250% of the federal poverty level.[52] These individuals are less likely to qualify for Medicaid as parents in most states, including Kentucky, where non-pregnant adults qualify for Medicaid only if their income is up to 138% of the federal poverty level, an annual income of $17,774.[53] Ensuring continued access to Medicaid in the postpartum period is a key policy strategy to address maternal mortality, particularly because a significant number of maternal deaths occur in the postpartum period. Currently, Kentucky Medicaid pays for 48.2% of all births and coverage ends 60 days postpartum for women who are not otherwise income eligible for Medicaid.[54] Women insured by Medicaid are more likely to have had a preterm birth or low birthweight baby, and to experience at least one chronic condition at delivery, putting them at higher risk for maternal morbidity and mortality.[55] Extending postpartum insurance coverage can also assist women in accessing substance use treatment and addressing other behavioral health needs that are contributors to maternal mortality.

2022 REGULAR SESSION LEGISLATION FILED TO ADDRESS MATERNAL MORTALITY IN KENTUCKY[56]

As of January 2022, seven bills related to maternal health have been introduced in the House and/or Senate in the 2022 regular legislative session. Table 2 on the next page provides a summary as of February 21, 2022.

Table 2. Proposed Legislation to Address Maternal Mortality in Kentucky, 2022 Regular Session

Bill Number	Sponsor	Summary
HB 41 (BR-147)	R. Roberts, (D) P. Minter (D)	Requires birthing facilities offering obstetric services to provide maternity patients with information regarding maternal depression and available resources
HB 37 (BR-254)	A. Scott (D)	Requires licensed health facilities to implement evidence-based implicit bias program for all health care providers involved in perinatal care
HB 38 (BR-255)	A. Scott (D)	Amends KRS 196.173 to allow inmates who are pregnant or postpartum to access midwifery or doula services
HB 39 (BR-256)	A. Scott (D)	Requires the Department for Medicaid Services to provide coverage for doula services
HB 173 (BR-232)	M. Cantrell (D) C. Stevenson (D)	Amends KRS 205.592 to require Medicaid to cover behavioral health services for eligible pregnant women for up to 12 months postpartum
HB 174 (BR-230)	M. Cantrell (D) C. Stevenson (D)	Amends KRS 205.592 to extend Medicaid eligibility for certain new mothers for up to 12 months postpartum
SB 95 (BR-1215)	J. Adams (R)	Requires the Cabinet for Health and Family Services to make information on postpartum depression and a postpartum assessment tool available on its website; requires healthcare providers providing postnatal care and pediatric providers to invite women to complete a postpartum assessment tool

WHAT'S NEXT FOR KENTUCKY?

Maternal mortality is a key issue in Kentucky, which has one of the highest rates in the country. Stakeholders across the state have made substantial advancements in addressing maternal mortality by establishing a multi-disciplinary maternal mortality review committee and a perinatal quality collaborative. One achievement of the Commonwealth's efforts is the opportunity to join AIM as a member state. The momentum continues with several prefiled bills related to maternal mortality for the 2022 session. Legislative action can provide Kentucky with additional opportunity to improve its maternal mortality and morbidity rates and continue building upon its successes.

While much has been accomplished in Kentucky to address high maternal mortality rates, there remain ample opportunities to build upon this work. Based upon our research and analysis, we recommend three key investments in research and data to support local and state efforts to ensure the health and survival of all pregnant and birthing Kentuckians.

KEY RECOMMENDATIONS

Invest in capacity for data collection and analysis to support local and regional efforts to improve maternal health.

More data collection and analysis capacity are needed to understand root causes of maternal mortality, particularly as it relates to geographic, health systems, and racial and ethnic disparities. Given the stark racial disparities that exist in the Commonwealth, data that allows a thorough investigation into the role of systems, policies, and practices in causing or addressing maternal mortality are essential. Further, the rural nature of Kentucky presents an opportunity to explore geographic variations in maternal mortality and identify targeted actions to improve maternal health in local communities. Opportunities to build data systems, such as an All-Payer Claims Database, can promote more comprehensive studies of maternal health, including in depth analyses on disparities.

Explore SDOH of maternal mortality in Kentucky more deeply and address root causes through policy and practice considerations.

Little is known about the role of SDOH specific to maternal mortality in Kentucky, largely due to limited data. Better information on SDOH and maternal mortality is critical for identifying root causes of maternal mortality, which should be considered when developing locally responsive policy and practice solutions. Community engaged outreach and research will enhance knowledge of social determinants and of maternal mortality more broadly, which will inform policy decision-making at the local and state levels. Additionally, better data can improve screening and referrals for SDOH at prenatal and postpartum visits, and documentation of this information.

Broadly disseminate research findings and other forms of reporting to key stakeholders to raise awareness of maternal mortality in Kentucky and leverage additional resources.

Data and research, when developed and delivered impactfully considering the context, can help inform efforts at the local and community levels as well as assist with leveraging key resources such as funding and technical assistance. Investments in the dissemination of research findings can contribute to significant gains in advancing maternal health in the Commonwealth.

CONTACT INFORMATION

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