Maternal Mortality Review 2018 Annual Report

2013-2017 Maternal Deaths in Kentucky
from the Public Health Office of Vital Statistics

Kentucky Department for Public Health
Division of Maternal and Child Health

November 2018

Kentucky Public Health
Prevent. Promote. Protect.

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Executive Summary

Infant mortality remains the single best indicator of the health of a state. Maternal mortality is another key indicator and has long-term repercussions on the infant mortality rate for the state. Both infant mortality and maternal mortality are priority needs of the Commonwealth of Kentucky. To reduce mortality, Kentucky will continue to promote optimal health prior to, during, and after pregnancy by promoting and addressing:

- Adequate nutrition and diet
- Exercise and reduction of obesity
- Identification and treatment of chronic health conditions
- Substance use, or tobacco use
- Healthy timing and spacing of the pregnancy
- Health equity
- Social determinants of health
    - Access to prenatal care or health care providers
    - Adequate health insurance
    - Transportation to medical visits
    - Social Supports
- Early and ongoing prenatal care
- Reduction of early elective deliveries by cesarean section

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 deaths occurring within one year of the termination of the pregnancy.

Per the CDC, about 700 women die each year in the United States as a result of pregnancy or delivery complications. The American College of Obstetricians and Gynecologists (ACOG) reported that more women die from pregnancy-related complications in the United States, than in any other developed country and that the maternal mortality rate has increased by 26% in recent years. Racial disparities exist with black women estimated to be three to four times more likely to die from a pregnancy-related complication than non-Hispanic white women. (Pregnancy-Related Deaths https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-relatedmortality.htm)

The recently reported 2016 maternal mortality rate in the U.S. is 18.8/100,000 births. 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 that over 60% of pregnancy-related deaths are preventable. (Building U.S. Capacity to Review and Prevent Maternal Deaths. 2018. Report from nine maternal mortality review committees. Retrieved from http://reviewtoaction.org/Report_from_Nine_MMRCs).

In the past five years, even some of the nation’s healthiest states, by overall rank, have experienced notable increases in key measures of mortality. (2017, America’s Health Rankings). America’s Health Ranking placed Kentucky as 42nd in the nation.

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Risk factors impacting mortality include tobacco use, obesity, racial disparities, depression, opioid use, and other social determinants of health such as transportation, access to care, domestic violence, and a geographically rural state. Higher than national rates for tobacco use during pregnancy, early elective deliveries, and premature births place Kentucky mothers and infants at a higher risk of death within the first year after the pregnancy.

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 pregnancy from:

- **Pregnancy-associated death**: Death of a woman while pregnant or within one year of the termination of the pregnancy regardless of the cause.
- **Pregnancy-associated, but not related death**: Death of a woman during pregnancy or within one year of the end of the pregnancy from a cause unrelated to pregnancy.
- **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.

The next step is to conduct an in-depth review to identify risk factors, system issues, and preventable causes of the death. The final step will be to use the data from the in-depth review to inform and guide public health prevention programs.

To determine these outcomes, the Maternal Mortality Review Committee (MMRC) will determine the response to the following questions:

1. Was the death pregnancy-associated, pregnancy-associated, but not related, or pregnancy related?
2. What was the cause and manner of the death?
3. Was the death preventable?
4. What contributed to the death?
5. What recommendations and actions are needed to address the contributing factors?
6. What is the anticipated impact if the actions were implemented?

History

Maternal mortality review has existed in the United States for more than a century. This process was conducted by medical professionals, primarily obstetricians, to determine if the maternal death had a preventable cause. The reviews were not legislated and occurred primarily in the facility in which the death occurred.

In Kentucky, maternal mortality review was initiated over 40 years ago through contracts with local universities to determine if any trends or patterns could be identified for prevention. A university maternal mortality chair specializing in obstetrics and maternal fetal medicine collaborated with obstetricians across Kentucky to review deaths identified from death certificates of women ages 12-50 who had been pregnant within 12 months prior to death.

There was no formal maternal mortality review legislation defining how the review should be conducted, who should participate, the expectations of outcomes, or provided protection from discoverability of any cases reviewed. Cases from pregnancy-associated, but not related deaths such as homicide, suicide, accident, or poisoning were excluded. This volunteer team of dedicated medical professionals met annually to share from the community level any concerns and issues impacting a positive pregnancy outcome. No formal report was published by this team.

In 2017, the CDC, ACOG, and the Association of Maternal and Child Health Program (AMCHP) began a focused effort to promote and build capacity in the United States for review and prevention of maternal mortality through the maternal mortality review process. This effort focused on expanding the scope of deaths reviewed, providing a consistent framework of the review, and developing multidisciplinary review committees.

Kentucky Maternal Mortality Review (MMR)

In the fall of 2017, Kentucky Maternal Mortality Review Advisory Team was organized. This team is comprised of state employees to include:

- Senior Deputy Commissioner for the Department for Public Health (retired obstetrician)
- Maternal and Child Health (MCH) Director and MCH Title V Block Grant Director (practicing neonatologist)
- Perinatal nurse consultant and inspector
- MCH senior epidemiologist
- MCH data officer
- Title V MCH Block Grant administrator and Nurse Administrator

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The MMR Advisory Team began an in-depth review of the current maternal mortality review process. With rising rates related to suicide, homicide, or overdose, MCH identified the need to expand the scope to include all deaths that were:

- Pregnancy-associated
- Pregnancy-associated, but not related
- Pregnancy-related

Using the valuable knowledge of the clinical providers, agencies, and maternal mortality experts, a structured maternal mortality review committee (MMRC) was organized. The format for the Kentucky MMRC aligns with guidance from CDC, ACOG and AMCHP. The goal of the MMRC is to identify risk factors and recommend prevention initiatives, policies, or systems change.

MMR Program Assessment and Strategic Plans

The mission of the Kentucky Maternal Mortality Review Program is:

- Identify all causes of maternal death in Kentucky
- Review cause and manner of maternal deaths to identify risk factors, system deficits, or preventable causes
- Promote a healthy pregnancy
- Prevent pregnancy complications that are related or associated with maternal deaths
- Protect the mother and infant

With the evaluation of available data, and with technical assistance and guidance from the CDC, the MMR Advisory Team met to determine program process and planning. From this strategic planning meeting, the following was accomplished:

- Identified chairperson for the Maternal Mortality Review Committee (MMRC)
- Created the committee membership from medical specialties and representatives from multiple disciplines:
    - Obstetricians and Maternal-Fetal Medicine providers from different Kentucky regions
    - Chief Medical Examiner
    - MCH Epidemiologist
    - MCH Prenatal Program Nurse Consultant and MMR Nurse Abstractor
    - Law Enforcement
    - Adult Protective Services
    - Social Services or Social Worker
    - Behavioral Health Provider
    - Mental Health Provider
    - ACOG representative
    - American Academy of Pediatrics representative
    - Association of Women's Health, Obstetric, and Neonatal Nursing representation
    - Cardiologist
    - Domestic Violence Advocate
    - Certified Nurse Midwife
    - OB Anesthesiologist

- Presented maternal morbidity and mortality information to birthing hospital staff, obstetricians and other members in attendance at the Kentucky Perinatal Association annual conference in June 2018
- Informed MCH Block Grant federal partners of plans during the annual face to face Title V update in August 2018
- Developed MMRC agenda and review materials

The first meeting of the new MMRC was October 30, 2018. During the meeting, the team reviewed initial available data, discussed expanded scope of reviews, and mission. Additional MMRC members were identified for recruitment. The MMRC reviewed process guidelines, forms, and materials and conducted two case reviews of 2016 maternal deaths. The team decided to begin retroactive reviews with 2017 cases.

Per Kentucky Revised Statute 211.684, the Kentucky Department for Public Health MMRC shall prepare an annual report that includes statistical analysis of the incidence and causes of maternal deaths in the commonwealth and provide recommendations for action. Publications, communications, or reports completed by the MMRC will align with state statutes.

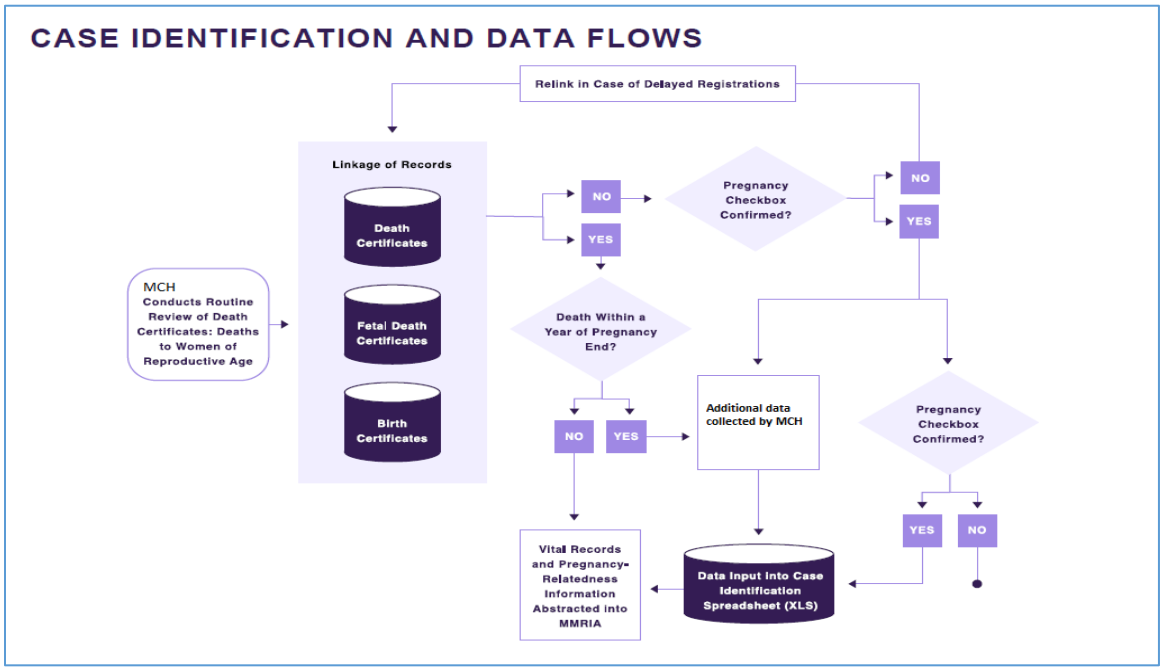
Methodology

From vital statistics data, MCH epidemiology staff reviewed data from 2013 to 2017 for:

- Deaths of women ages 10 to 55 years
- Deaths linked to live birth certificates or stillborn death certificates occurring within one year prior to death
- Deaths identified by the completion of the pregnancy boxes on the death certificate

Case identification and data flow are illustrated in Figure 1.

Figure 1



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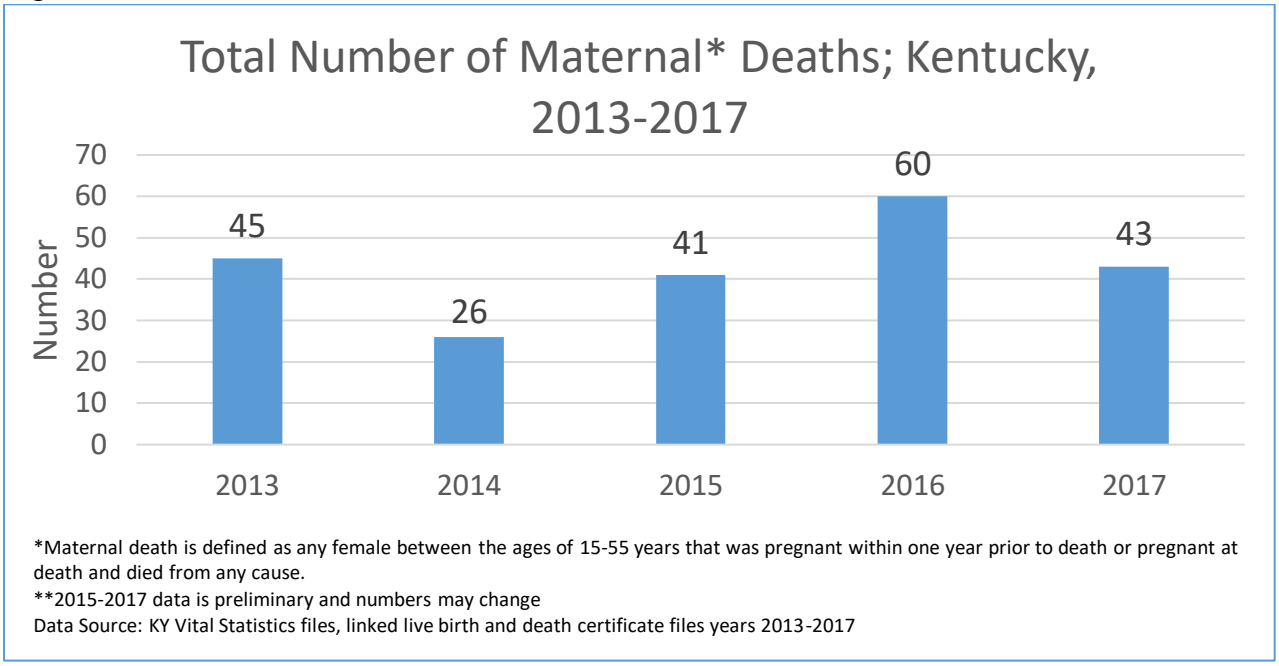
The Kentucky Maternal and Child Health MMR team participated in multiple CDC and MCH Title V Regional calls to determine the manner in which other states were addressing maternal death reviews and approaching prevention efforts. The CDC provided technical assistance to begin developing process and procedures for a multidisciplinary state team, records management, data review, and documentation of the reviews and outcomes. Nationally, 33 states are either restructuring existing review committees or creating new teams and processes. On November 27, two nurses traveled to the CDC Maternal Mortality Review Information Application (MMMRIA) training to assure Kentucky data sets align with national standards to assure accuracy of abstraction and data collection.

Figure 2



*Maternal death is defined as any female between the ages of 15-55 years that was pregnant within one year prior to death or pregnant at death and died from any cause.
**2015-2017 data is preliminary and numbers may change
Data Source: KY Vital Statistics files, linked live birth and death certificate files years 2013-2017

Preliminary review of the number of maternal deaths was conducted. As noted in Figure 2, maternal deaths rose in 2016. During this same time period, Kentucky had an increase of Sudden Unexpected Infant Deaths (SUID), a rise in premature births, and a rise in the number of infants born with substance exposure or diagnosed with neonatal abstinence syndrome (NAS). Kentucky has approximately 50,000 to 54,000 births annually. Figure 3 illustrates Kentucky's rate of maternal death per 100,000 live births.

Preliminary 2018 vital statistics data for maternal death revealed Kentucky has already surpassed the number of maternal deaths from 2017 and may surpass the 2016 totals. The number of deaths for each year is reflective of all causes of maternal death as identified on the death certificate.

Because the number of 2014 deaths were lower than other years, vital statistics death data was re-evaluated but no explanation was evident. An in-depth MMRC case review is needed to determine factors that may explain the 2014 data.

Figure 3

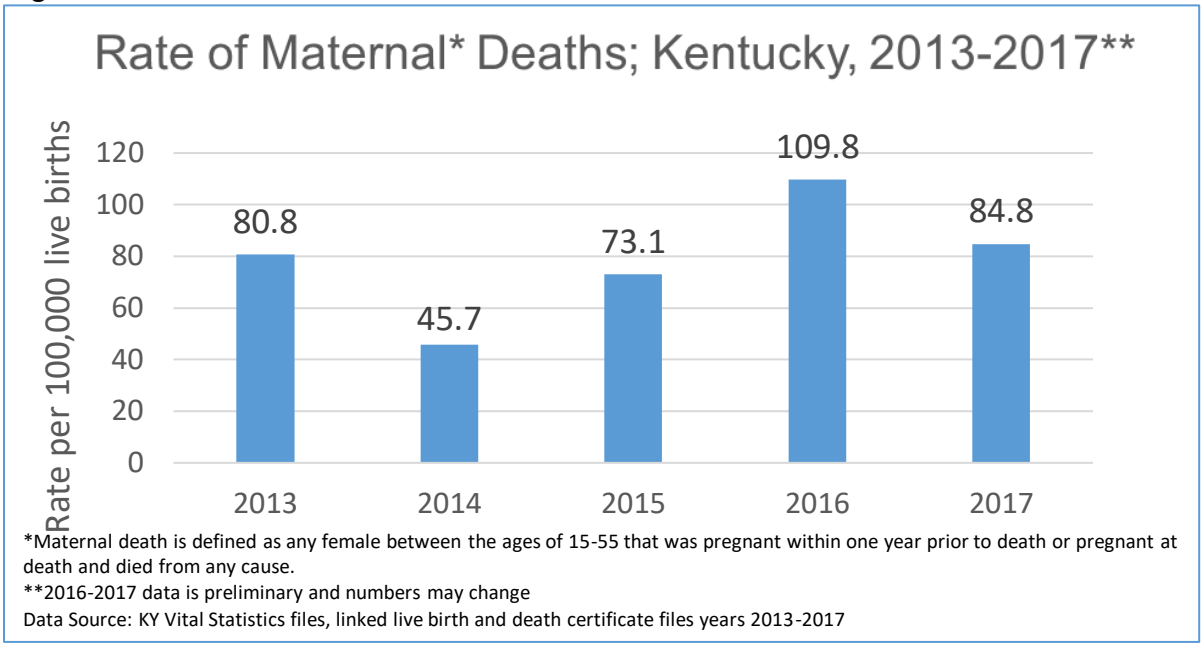


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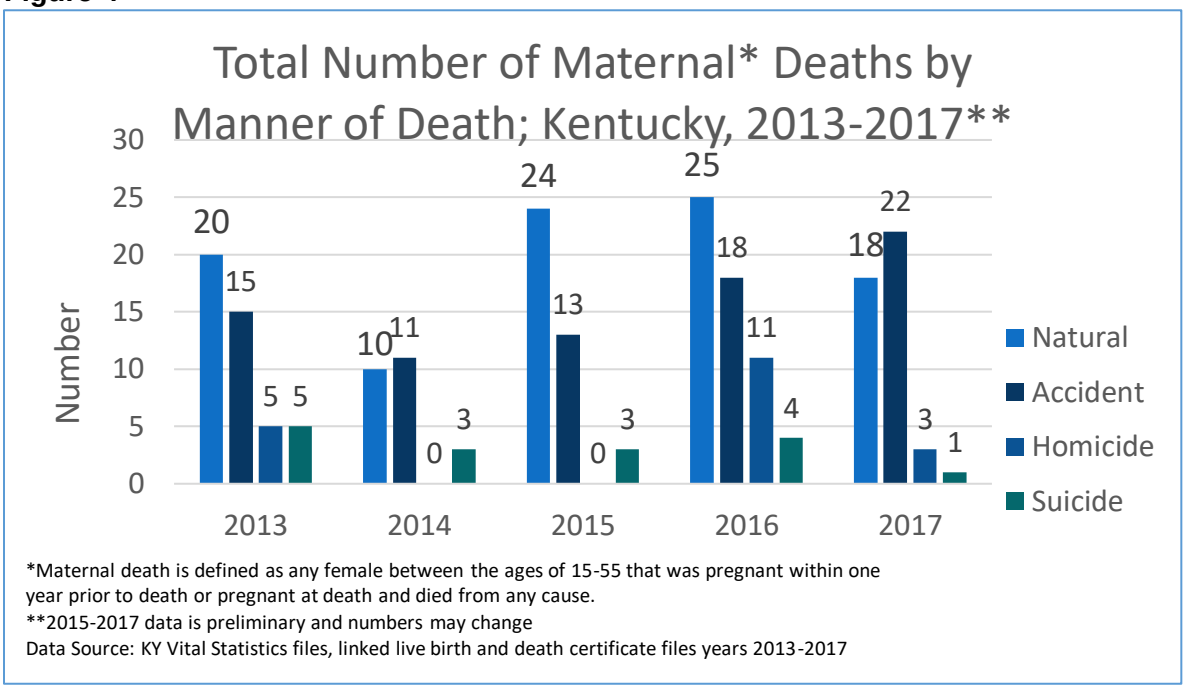
Figure 4 shows a rising number of cases related to accident, homicide and suicide mirroring trends reported nationally, and supports the MCH MMR process to include these cases for future review. Nationally, social determinants of health have a significant impact on deaths from these causes.

Homicide deaths rose in 2016 and 2017 suggesting a need for review of domestic violence referrals and follow-up. Suicide deaths did not significantly change. Ongoing assessment of maternal mental health and potential depression should continue.

Figure 4



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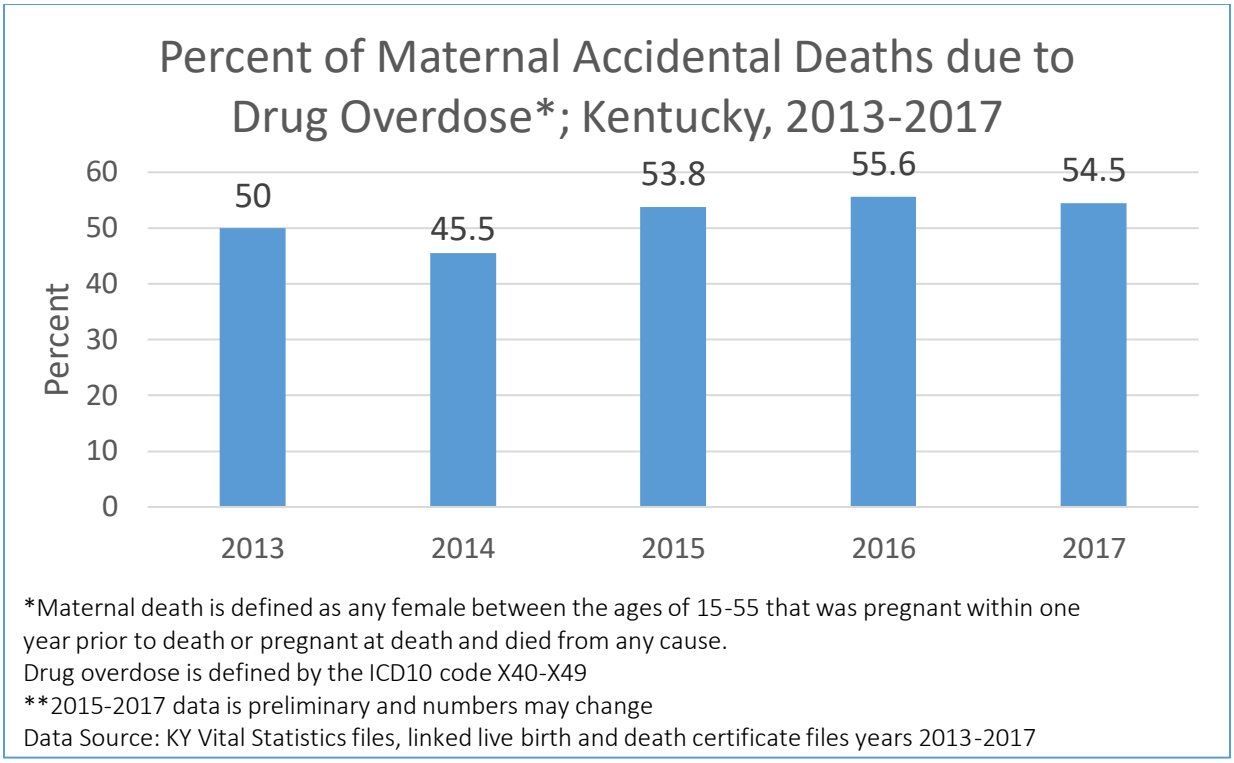
With an understanding of health risks and behaviors in Kentucky impacting pregnancy outcomes, premature births, and SUID deaths, data will be examined using ICD-10 codes to ascertain if the number of accidental deaths were related to drug overdose/other causes.

Many of the certificates had multiple ICD-10 codes consistent with substance use or infected injection sites. Preliminary conclusions identified over half of accidental maternal deaths in Kentucky were directly related to drug overdose (Figure 5). This information strengthens a need to address substance use prior to or early in pregnancy and confirms a need for ongoing management after delivery. Further individual abstraction of medical records and review of these cases by the MMRC is necessary to confirm causes based on medical coding.

Figure 5



*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 ICD10 code X40-X49
**2015-2017 data is preliminary and numbers may change
Data Source: KY Vital Statistics files, linked live birth and death certificate files years 2013-2017

For these cases it would be beneficial to learn if early identification and treatment was initiated, depression screening completed, and community services available for prevention of death. Psychosocial and environmental risk factors associated with maternal health conditions include:

- Chronic stressors, such as racism and poverty
- Access to care to include: insurance, transportation and providers
- Unplanned pregnancy
- Social isolation and lack of social supports
- Homelessness
- Domestic violence
- Unsafe neighborhoods
- Chronic Disease Management
- Substance use
- Obesity, lack of exercise, poor nutrition

Program Prevention Efforts

Prevention efforts to reduce mortality have been ongoing. These efforts include:

- MCH Title V Block Grant support of evidence informed perinatal programming and strategies including assessment of health, chronic health conditions, substance use, tobacco use, domestic violence screening and mental health screening. From this assessment, referrals are made to various programs and providers for evaluation and treatment.
- Collaboration with March of Dimes, Kentucky Chapter for promotion of 17 Alpha-hydroxyprogesterone caproate (17-P) to reduce risk of premature birth. Kentucky received a March of Dimes grant for use to identify women with previous history of premature births, and provide the pregnant women with educational materials and information to discuss with her obstetrician regarding use of 17-P.
- Collaboration with local health departments, birthing facilities, and March of Dimes, Kentucky Chapter to reduce early elective deliveries using the evidence informed strategies of Healthy Babies are Worth the Wait.
- Informing and education to promote positive health outcomes annually at the Kentucky Perinatal Association Annual Conference.
- Assistance to mothers for completion of presumptive eligibility requirements for Medicaid.
- Kentucky participates in a Social Determinants of Health Collaborative Improvement and Innovation Networks (CoIINs). This CoINN works with the Office of Health Equity, March of Dimes, Greater Kentucky Chapter, Louisville Healthy Start Program and Maternal and Child Health Division to provide ongoing training about social bias, with long term plans to address equity in the Administrative Reference and Core Clinical Service Guide for Kentucky Health Departments.

Summary

In Kentucky, and nationally, maternal death is the worst maternal outcome. One maternal death is one too many. Kentucky is poised to address this by committing to comprehensive assessment of causes and risk factors leading to this negative outcome. The Kentucky MMRC will perform a comprehensive review and determination of underlying causes of death, characterization of the death, and determination of preventable interventions and response. From these reviews, guidance and recommendations could lead to evidence-based initiatives to reduce morbidities and deaths.