Maternal mortality in Utah

Utah Department of Health & Human Services

2017–2020

We dedicate this report to those we have lost, with sympathy and respect for their families and loved ones.

Table of contents

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Summary

We cannot improve what we do not understand.

The Utah Department of Health and Human Services leads the Perinatal Mortality Review Program, which seeks to understand what happens when a pregnant or postpartum person dies. This report highlights the findings from our review of every Utahn who died while pregnant or within the year after they were pregnant. We sought to determine what caused these tragic events and whether any changes in policy, resources, or support could have prevented them.

From 2017–2020, Utah communities and families lost 87 pregnant or postpartum individuals, which equates to a pregnancy-associated mortality ratio of 46.2 maternal deaths per 100,000 live births. This ratio reveals a small but steady rise in maternal mortality in Utah, similar to the rising trend seen nationwide.

Maternal deaths are more likely to occur among Utahns who are 35 years or older (62.6 deaths per 100,000 live births) and have less than a high school education (96.9 deaths per 100,000 live births). Utahns who identify as American Indian and Alaska Native were disproportionately impacted by maternal mortality. American Indian and Alaska Native women make up 0.9% of all those with live births, but 5.8% of maternal deaths. Suicide and accidental drug overdose are leading causes of pregnancy-associated deaths in Utah. The majority (60.9%) of maternal deaths occur late postpartum or more than 42 days after their pregnancy ended. **Importantly, 7 out of 10 maternal deaths (71.3%) are preventable.**

Recommendations

The multidisciplinary Maternal Mortality Review Committee (MMRC) reviews pregnancy-associated deaths in Utah and makes recommendations to address the contributing factors that caused them.

Recommendations are grouped into 4 themes.

1. Build healthier communities. (pg. 22)
2. Provide quality healthcare. (pg. 23)
3. Mental healthcare is preventive. (pg. 24)
4. Improve our response to substance use. (pg. 26)

Maternal Mortality Review Committee

The Utah Department of Health and Human Services Maternal and Infant Health Program leads the Perinatal Mortality Review Program. This program reviews all pregnancy-associated (maternal) deaths. The process of reviewing maternal deaths began in Utah in 1995.

In 2019, the Utah Perinatal Mortality Review program partnered with the Wyoming Department of Health Maternal and Child Health Program to apply for the Centers for Disease Control and Prevention (CDC) Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) grant. The application was successful, and the Utah-Wyoming partnership became 1 of 39 maternal mortality review committees funded by the CDC. The Utah-Wyoming Maternal Mortality Review Committee is multidisciplinary, representing public health, clinical practice, and community partners.

The Utah Perinatal Mortality Review Program identifies pregnancy-associated deaths through the pregnancy checkbox or cause of death fields on death certificates, or by matching birth and death certificates. We try to identify all pregnancy-associated deaths, but acknowledge we may miss some deaths, such as those who experienced an early pregnancy loss that was not recorded on their death certificate.

The committee assesses each maternal death to determine the cause of death, if the death was related to pregnancy, if there was some chance the death could have been prevented, and identifies contributing factors that led to the death. The committee then makes recommendations to prevent similar future deaths.

Introduction

Maternal deaths are tragic losses for families and communities.

Ideally, a maternal death is an event that would never happen. Unfortunately, the impacts of pregnancy and birth can be significant on a person and are not without risk. Pregnancy affects every system of the body and can alter every aspect of that person's life. Most people will have uncomplicated pregnancies, but others will experience severe illness, life-long consequences, and sadly some will not survive.

Maternal deaths can be like the "canary in a coal mine," highlighting dangerous or unhealthy conditions that put the whole community at risk. That's why monitoring maternal mortality is a top priority for public health agencies. Our multidisciplinary Maternal Mortality Review Committee meets 6 times a year to review all maternal deaths of Utah residents. **A maternal death is any death during or within one year of pregnancy, regardless of pregnancy outcome or duration.** This report shares data on how many people died during and after pregnancy, describes specific factors that contributed to these deaths, and identifies how to prevent similar deaths.

This report describes maternal deaths from 2017-2020 which reflects the most recent unpublished data available. Even though there is a natural lag between when a death happens, is reviewed, and is reported on, we can still learn from these events and the vast majority of our recommendations remain relevant.

The Utah Department of Health and Human Services extends our gratitude to past and current members of the Maternal Mortality Review Committee for volunteering their time and expertise in case review and development of recommendations to prevent future deaths and improve maternal well-being.

This report describes both pregnancy-associated and pregnancy-related deaths.

Pregnancy-associated death
A death during or within one year of pregnancy, regardless of the cause of death. These deaths consist of both pregnancy-related deaths and pregnancy-associated, but not related deaths. In this report, we use pregnancy-associated death interchangeably with **maternal death**.

Pregnancy-related death
A death during or within one year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. Pregnancy-related deaths are a subset of pregnancy-associated deaths.

Births in Utah

Utah has the 5th highest birth rate in the United States.

The following birth statistics are provided to help frame our findings. We recognize this information is limited, since not all maternal deaths occur following a live birth. However, at this time, we do not have more complete population-level data on other pregnancy outcomes, such as miscarriage.

There were 188,345 live births to Utah residents from 2017 to 2020. The number of births decreased each year from 48,578 births in 2017 to 45,724 births in 2020. Most births occurred to women between the ages of 20 and 29 years (54.5%) and those living in urban areas (81.8%). Nearly half of Utah births (45.7%) were to people with a college degree. Most people who gave birth in Utah identified as White (84.7%) and non-Hispanic (80.1%). Most births occurred in a hospital (96.8%) and most people delivered vaginally (76.8%). More detailed birth information is in Table 1 and can also be accessed through the Utah IBIS online data portal (https://ibis.utah.gov/ibisph-view/).

Table 1. Maternal demographics, socioeconomic characteristics, and delivery characteristics (n, %) for all live births, Utah 2017–2020.[1-3]

		Number	Percent
Live births to Utah residents		**188,345**	**100.0%**
	2017	48,578	25.8%
	2018	47,211	25.1%
	2019	46,832	24.9%
	2020	45,724	24.3%
Residence	Rural	34,317	18.2%
	Urban	153,981	81.8%
Ethnicity	Hispanic	31,923	16.9%
	Non-Hispanic	150,906	80.1%
Race	American Indian/Alaska Native	1,774	0.9%
	Asian/Asian American	4,736	2.5%
	Black/African American	2,517	1.3%
	Native Hawaiian/Pacific Islander	1,817	1.0%
	White	159,453	84.7%
	Other/more than 1 race	13,352	7.1%
Age	<25 years	44,801	23.8%
	25–29 years	64,209	34.1%
	30–34 years	50,544	26.8%
	35+ years	28,768	15.3%
Education	Less than high school education	14,442	7.7%
	High school degree	37,053	19.7%
	Some college education	45,830	24.3%
	College degree[4]	86,013	45.7%
Birth setting	Freestanding birth center	1,733	0.9%
	Home	4,303	2.3%
	Hospital	182,230	96.8%
	Other[5]	78	0.04%
Delivery method	Cesarean section	42,909	22.8%
	Vaginal	144,702	76.8%

1. All live births to Utah residents regardless of where they occurred.
2. Data may not sum to 100% because unknown values are not shown and percentages are rounded.
3. Data source: IBIS data query (10/1/2024), Utah Birth Certificate Database, Office of Vital Records and Statistics, Utah Department of Health and Human Services.
4. College degree includes associate, bachelor's, master's, doctorate, and professional degrees.
5. Other includes clinic, doctor's office, and hospital parking lot.

Pregnancy-associated deaths

There were an average of 22 maternal deaths a year in Utah (2017–2020).

Maternal deaths are tragic and relatively rare events. Even one additional maternal death can impact the mortality ratios we use to describe maternal mortality in Utah.[1] Even with this variability, we see a statistically significant increasing trend in maternal mortality in Utah from 2010 to 2020 (Figure 1).[2] Reasons for this increase are not entirely clear, but may be due in part to increases in chronic diseases that impact maternal health, including hypertension, diabetes, heart disease, and mental health conditions. It could also be from improved identification of maternal deaths. While maternal mortality is increasing in Utah and the United States, many other countries have seen declining rates.[3]

From 2017 to 2020, 87 Utah residents died during pregnancy or within one year of their pregnancy, an average of 22 deaths per year. The pregnancy-associated mortality ratio for this period is 46.2 maternal deaths per 100,000 live births (Figure 1, Table 2).

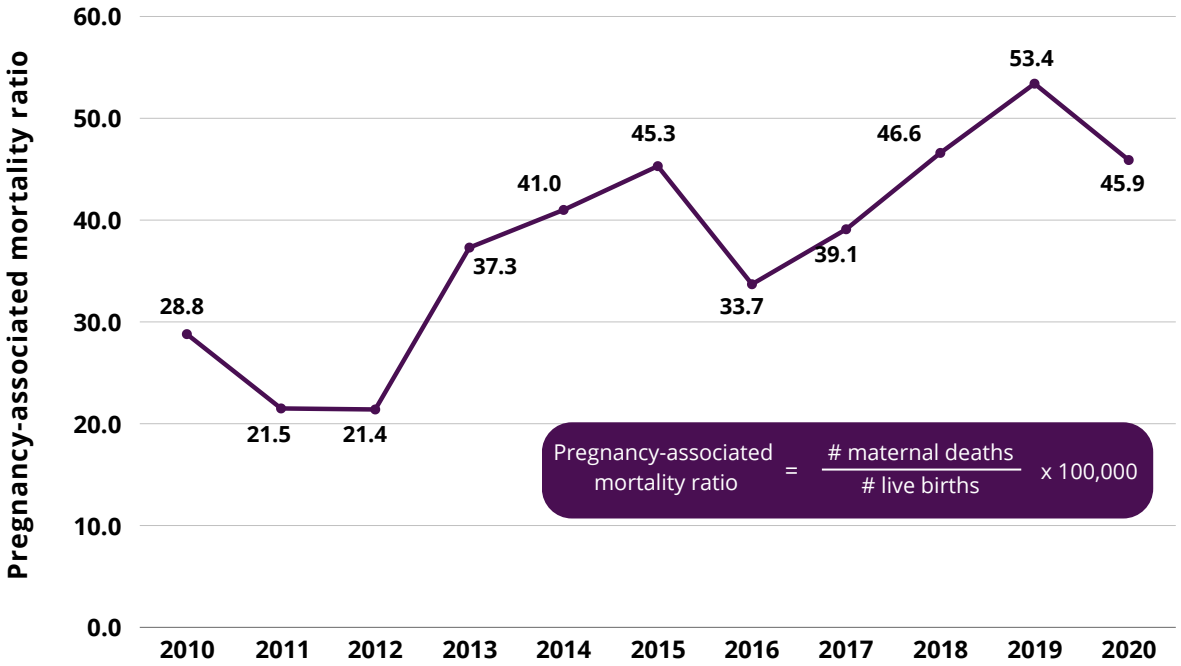


Figure 1. Pregnancy-associated mortality ratios, Utah 2010-2020.

1. We calculate ratios, instead of rates, because the denominator includes only live births since data on all pregnancies is limited. This is consistent with other state and national methods. The terms "ratio" and "rate" are often used interchangeably when describing maternal mortality, even though a true rate is not calculated.
2. Mann-Kendall trend test, $p<0.05$
3. Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division. Geneva: World Health Organization; 2023.

Table 2. Pregnancy-associated deaths (n, %) and pregnancy-associated mortality ratios in Utah, 2017–2020.

		Number (n=87)	Percent	Pregnancy-associated mortality ratio (# maternal deaths per 100,000 live births)	95% confidence intervals
Maternal deaths	2017	19	21.8%	39.1	23.5-61.1
	2018	22	25.3%	46.6	29.2-70.6
	2019	25	28.7%	53.4	34.5-78.8
	2020	21	24.1%	45.9	28.4-70.2
	2017–2020	87	100.0%	46.2	37.0-57.0
Residence	Rural	17	19.5%	49.5	28.9-79.3
	Urban[1]	70	80.5%	45.5	35.4-57.4
Ethnicity	Hispanic	12	13.8%	37.6	19.4-65.7
	Non-Hispanic	75	86.2%	49.7	39.1-62.3
Race[2]	American Indian/Alaska Native	5	5.8%	281.8	91.5-657.7
	Asian/Asian American	3	3.5%	63.3	13.1-185.1
	Black/African American	4	4.6%	158.9	43.3-406.9
	Native Hawaiian/Pacific Islander	2	2.3%	110.1	13.3-397.6
	White	71	81.6%	44.5	34.8-56.2
	Other	2	2.3%	15.0	1.8-54.1
Age	<25 years	14	16.1%	31.2	17.1-52.4
	25–29 years	26	29.9%	40.5	26.5-59.3
	30–34 years	29	33.3%	57.4	38.4-82.4
	35+ years	18	20.7%	62.6	37.1-98.9
Education	Less than high school degree	14	16.1%	96.9	53.0-162.6
	High school degree	27	31.0%	72.9	48.0-106.0
	Some college education	19	21.8%	41.5	25.0-64.7
	College degree[3]	27	31.0%	31.4	20.7-45.7

1. Data interpretation example: 70 residents of urban counties died during pregnancy or within 1 year of their pregnancy ending from 2017 to 2020. For every 100,000 live births to urban residents, there were 45 women living in urban counties who experienced a pregnancy-associated death.
2. Maternal deaths are rare events and may fluctuate considerably from year to year. Small counts (n<8) are provided for descriptive purposes only. Mortality ratios reported for race must be interpreted with caution. Ratios calculated from small counts, less than 8 in the numerator, may be unstable and may not reflect true trends in maternal deaths.
3. College degree includes associate, bachelor's, master's, doctorate, and professional degrees.

Data source: Utah Perinatal Mortality Review Program data, 2017-2020.

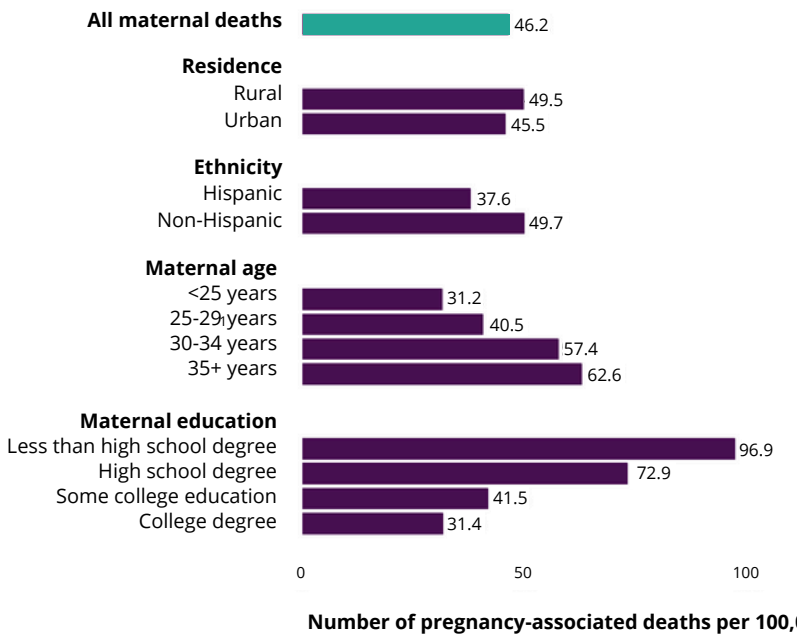


Figure 2. Pregnancy-associated mortality ratios by demographic and socioeconomic characteristics, Utah 2017–2020.

Pregnancy-associated mortality increases with maternal age. People younger than 25 years have the lowest rates of maternal mortality (31.2 deaths per 100,000 live births) compared to those 35 years or older (62.6 deaths per 100,000 live births). In other words, those 35 years or older are twice as likely to die during or within 1 year of pregnancy compared to those younger than 25 years.

Maternal mortality decreases as education increases. Pregnancy-associated deaths are highest among those with less than a high school education (96.9 deaths per 100,000 live births) and lowest among those with a college education (31.4 deaths per 100,000 live births). Individuals with less than a high school education are 3 times as likely to die during pregnancy or within 1 year of pregnancy as those who have a college degree.

The number of pregnancy-associated deaths by race and ethnicity is presented in Table 2. The risk of **maternal mortality is 25% lower among Hispanic women** (37.6 deaths per 100,000 live births) compared to non-Hispanic women (49.7 deaths per 100,000 live births) in Utah.

Trends in maternal mortality by race must be interpreted carefully. Ratios calculated from small counts in the numerator (n<8) may be unstable therefore the specific ratio number may not be accurate. For this reason mortality ratios for race are not depicted in Figure 2. However, we can still learn by comparing trends in birth to maternal deaths. By doing so, we see that **women who identify as American Indian and Alaska Native are overrepresented in maternal deaths**, making up 0.9% of those with live births, but 5.8% of pregnancy-associated deaths (2017–2020).

Pregnancy-related deaths

Pregnancy-related deaths are a subset of pregnancy-associated deaths.

Approximately 4 out of 10 maternal deaths were related to pregnancy from 2017–2020 (n=38, 43.7%) (Table A-1). A pregnancy-related death is a death during or within 1 year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. Pregnancy-relatedness is determined by the Maternal Mortality Review Committee.

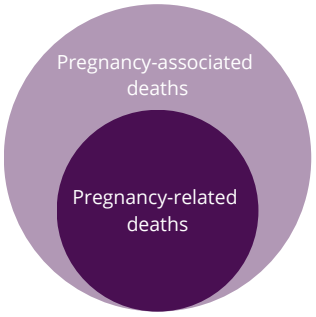


Figure 3. Pregnancy-related deaths are a subset of pregnancy-associated (maternal) deaths.

The pregnancy-related mortality ratio for 2017–2020 was 20.2 deaths per 100,000 live births in Utah. This is slightly higher than the national pregnancy-related mortality ratio (19.2 deaths per 100,000 births) during the same time (2017-2020). We often use pregnancy-related mortality ratios to compare across states. However, differing definitions and review processes in each state can make comparisons challenging. Appendix B has more information about how to compare maternal mortality estimates.

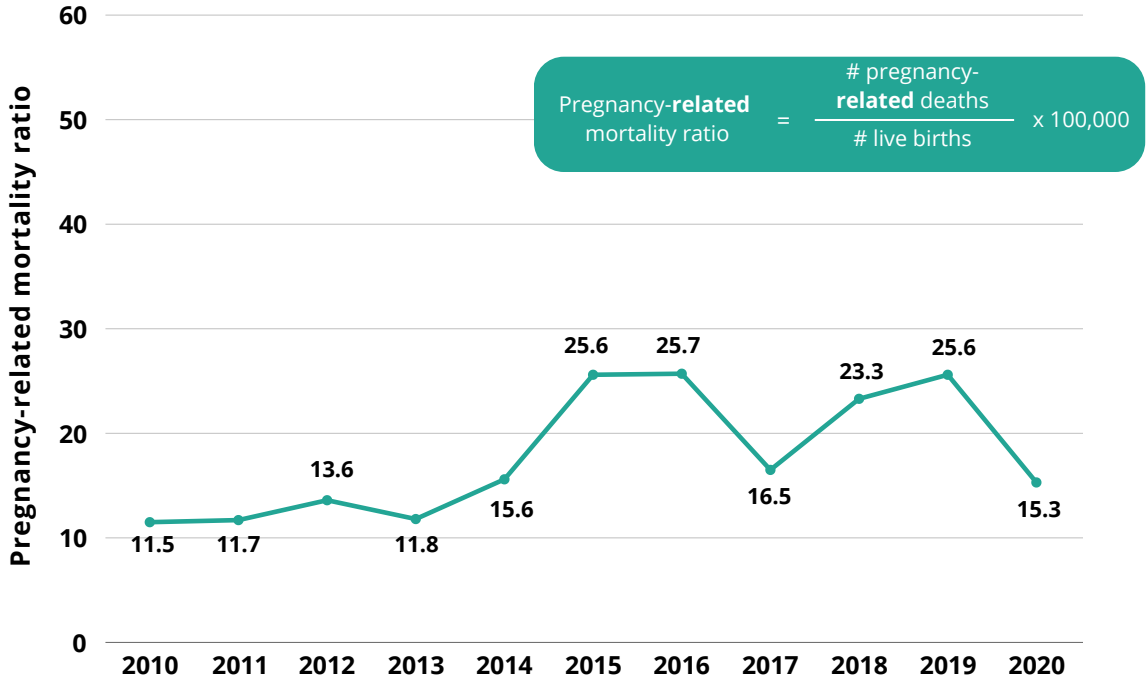


Figure 4. Pregnancy-related mortality ratios, Utah 2010-2020.

Timing of maternal deaths

Maternal deaths can occur during pregnancy, delivery, and postpartum.

In Utah, maternal deaths occurred during pregnancy, delivery, and throughout the first year after the birth (called postpartum). The majority of pregnancy-associated deaths (n=53, 60.9%) and half of pregnancy-related deaths (n=19, 50.0%) in Utah occurred late postpartum between 6 weeks and 1 year from when the pregnancy ended (Figure 5, Table A-2).

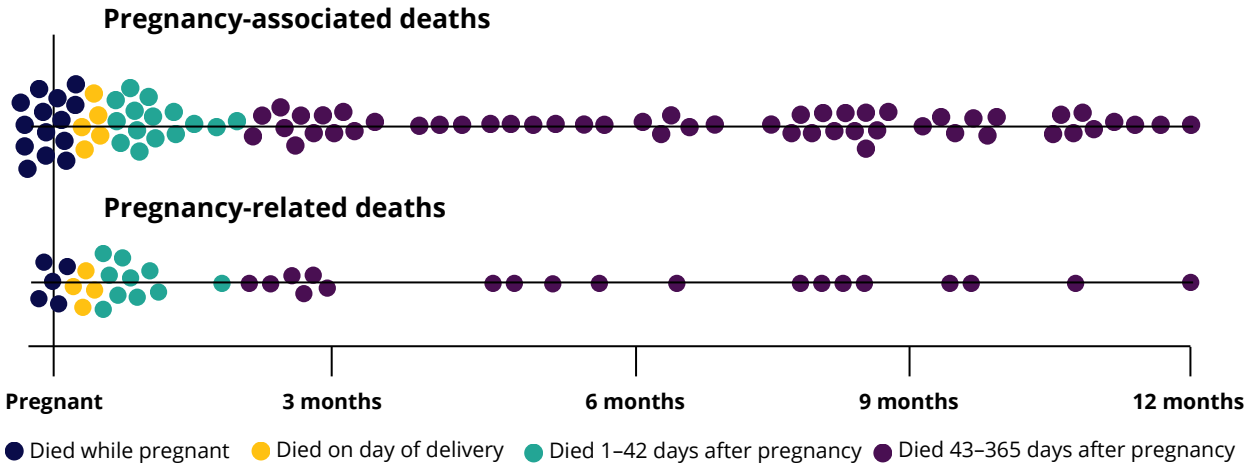
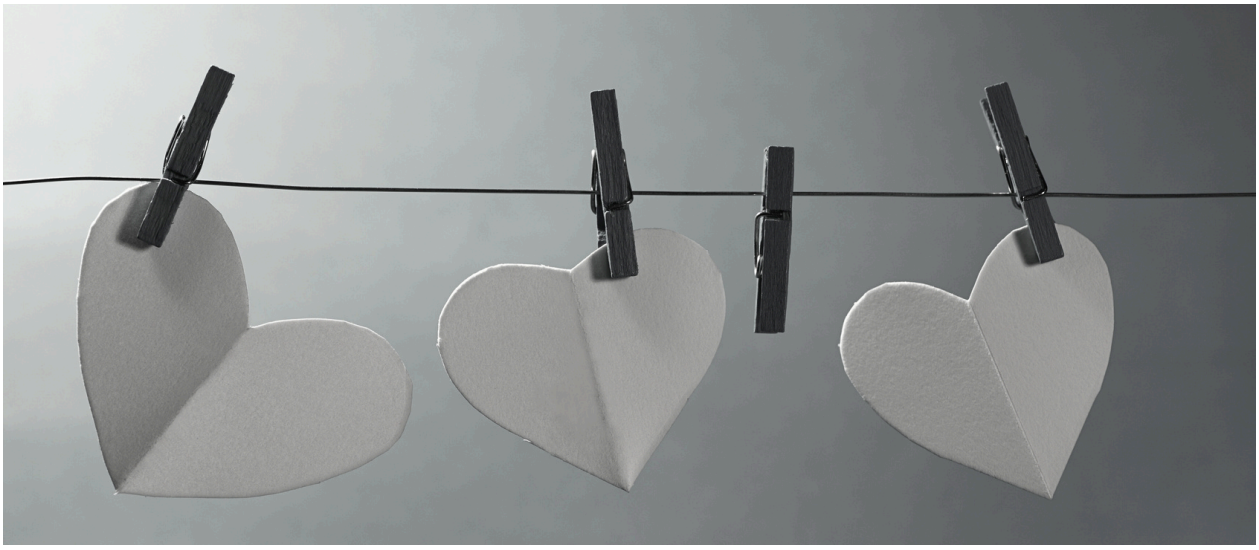


Figure 5. Timing of pregnancy-associated (n=87) and pregnancy-related (n=38) deaths, Utah 2017–2020.



Preventability

Maternal deaths can be prevented.

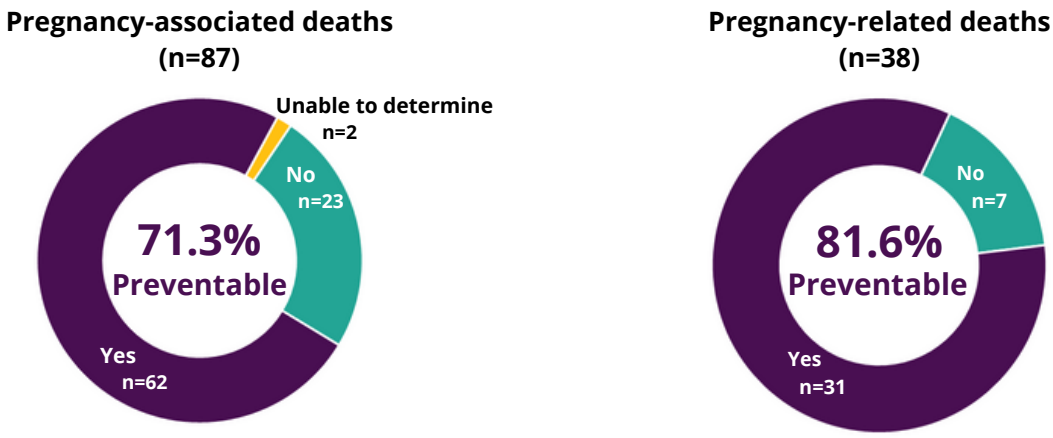


Figure 6. Preventability of pregnancy-associated (n=87) and pregnancy-related (n=38) deaths, Utah 2017–2020.

Approximately 7 out of 10 pregnancy-associated deaths (71.3%) and 8 out of 10 pregnancy-related deaths (81.6%) were preventable (Figure 6). A death is considered preventable if the Maternal Mortality Review Committee determines there was at least some chance of the death being averted by one or more reasonable changes at the patient, provider, facility, systems, or community levels.

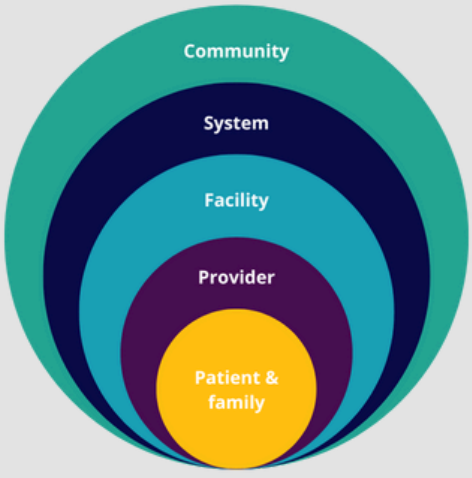


Figure 7. Prevention of maternal deaths is multifactorial across multiple levels.

An essential role of the Maternal Mortality Review Committee is to determine if there was some chance a maternal death could have been prevented. The committee then generates recommendations to prevent similar deaths in the future. Preventability is often multifactorial and discussions may center around patient, provider, facility, system, and community-level interventions. The intent of the review committee is not to place blame on individual care providers, but to highlight opportunities to prevent future maternal deaths. By applying the socioeconomic model (Figure 7) to the review process, the committee can identify multiple factors that interact to impact the health and well-being of pregnant and postpartum individuals, and make recommendations to address these factors.

Cause of death

Accidental overdose and suicide are the leading causes of pregnancy-associated deaths in utah.

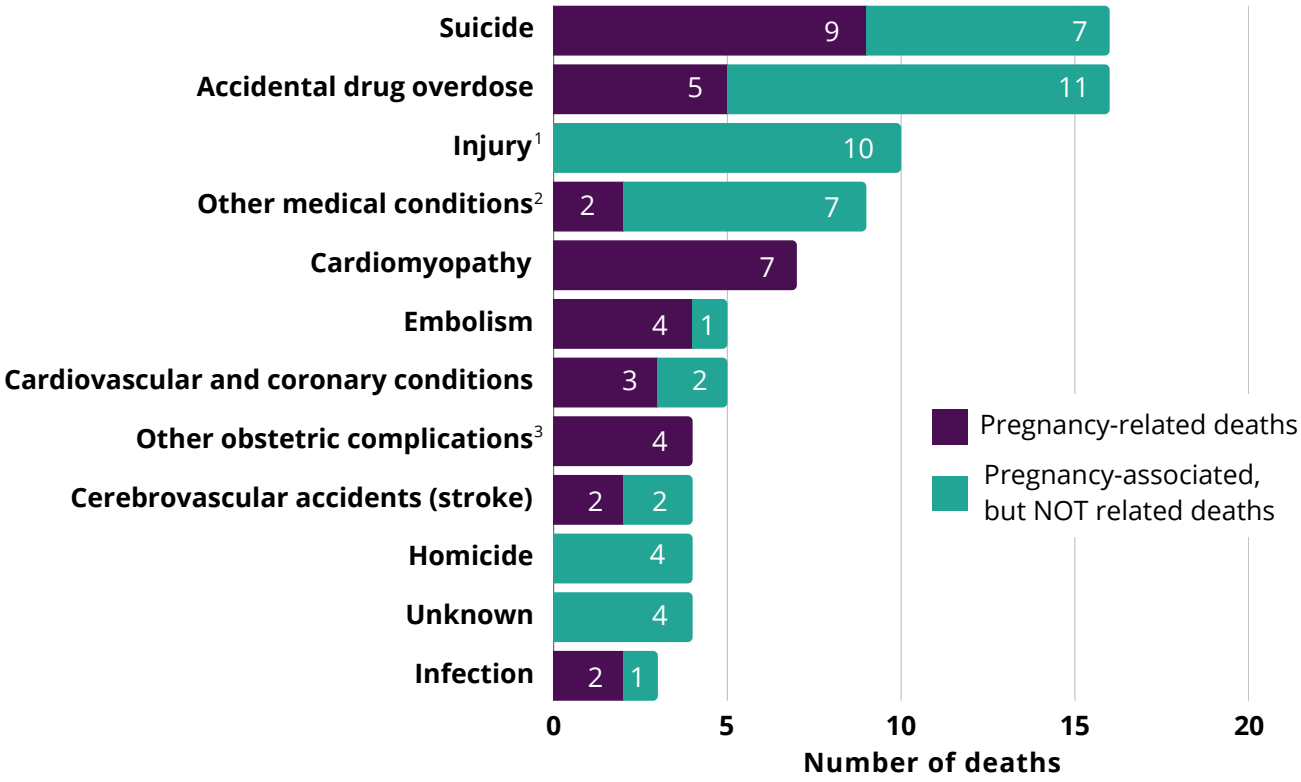


Figure 8. Causes of pregnancy-associated and pregnancy-related deaths, Utah 2017–2020.[4]

Suicide is a leading cause of death for both pregnancy-associated and pregnancy-related deaths in Utah.

Together, suicide and accidental overdose account for one-third (n=32, 36.8%) of all pregnancy-associated deaths (Figure 8, Table A-3).

Suicide (n=9, 23.7%) and cardiomyopathy (n=7, 18.4%) are leading causes of death among only pregnancy-related deaths.

1. Injury includes accidental injuries related to motor vehicles and falls.
2. Other medical conditions include cancer, kidney disease, respiratory disease, liver disease, and seizure disorder.
3. Other obstetric complications include amniotic fluid embolism, hemorrhage, and eclampsia.
4. Pregnancy-associated deaths are comprised of pregnancy-related deaths and pregnancy-associated but NOT related deaths.

Contributing factors

Mental health conditions contributed to nearly half of all pregnancy-associated deaths in Utah.

During the review process, the Maternal Mortality Review Committee asks the following questions:

- Did **obesity** contribute to this death?
- Did **substance use disorder** contribute to this death?
- Did **mental health conditions** contribute to this death?
- Did **discrimination** contribute to this death?[1]

The most common contributing factors were mental health conditions (n=38, 43.7%) and substance use disorder (n=32, 36.8%). Discrimination was found by the committee to contribute to only 5% of maternal deaths. Research is increasingly identifying discrimination as a contributor to these deaths, but can be difficult to pick up from medical records. A top priority of the Utah Perinatal Mortality Review program is to improve our understanding of how discrimination contributes to maternal mortality.

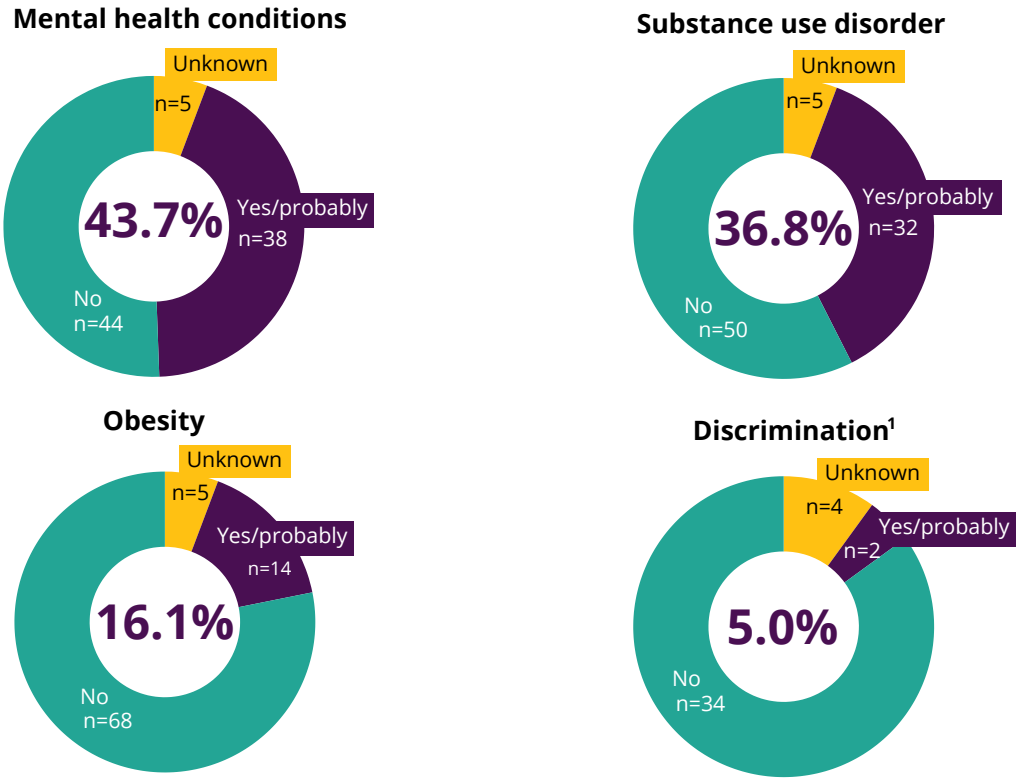


Figure 9. The Maternal Mortality Review Committee identified mental health conditions and substance use disorder as common contributing factors of pregnancy-associated deaths in Utah from 2017–2020.

1. The question, "Did discrimination contribute to this death?", was added to the review process in June 2020. Data reported here only apply to deaths (n=40) reviewed after the addition of this question. Whether a death was assessed for discrimination as a contributing factor was solely related to the timing of the review and not to any details of the death.

Social and emotional stressors

1 in 4 people experienced financial barriers to care.

Of the 87 individuals who died during or within 1 year of pregnancy, 28.7% had at least one documented barrier to healthcare (n=25). Twenty individuals had financial barriers and 13 individuals had transportation barriers to care (Figure 10). The majority (n=58, 66.7%) of individuals experienced at least one social or emotional stressor. The most common stressors were a history of substance use (n=35), unemployment (n=25), and childhood trauma (n=23) (Figure 10). Since the data reflect *documented* barriers and stressors, these counts are likely under-reported.

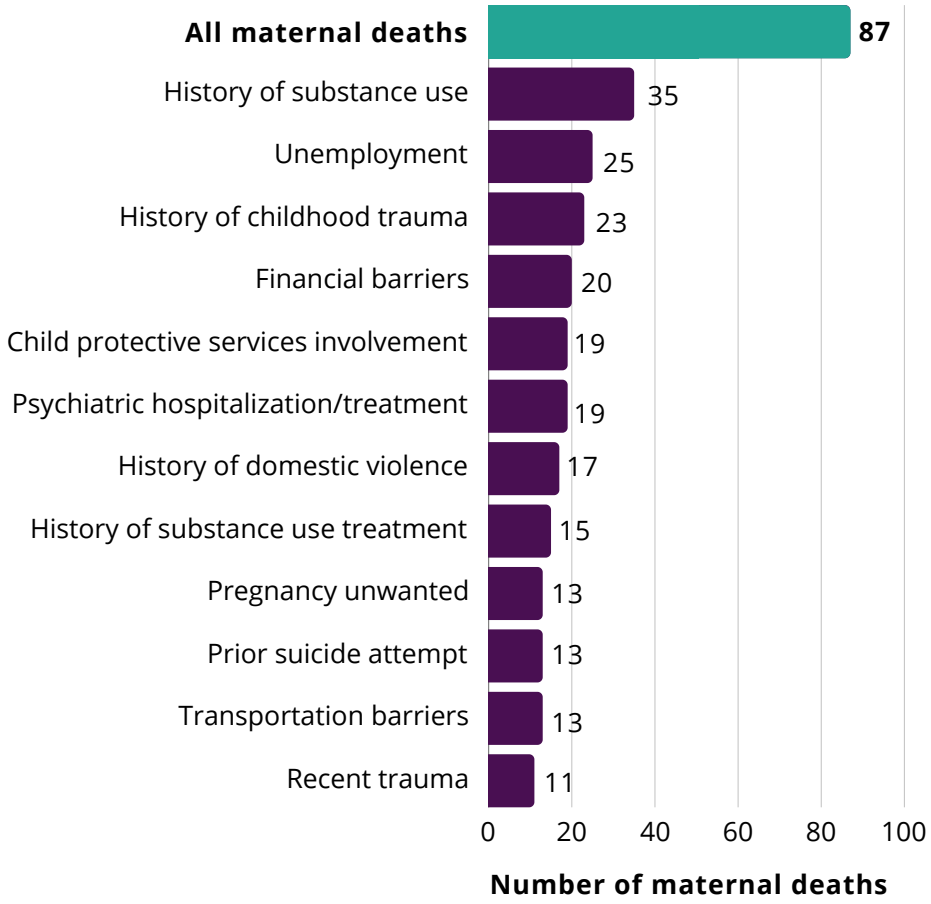


Figure 10. Number of people who experienced a *documented* social or emotional stressor prior to their pregnancy-associated death, Utah 2017–2020.[1]

1. These counts will not sum to 100% because the experience of stressors is not mutually exclusive. An individual may have experienced any number of social or emotional stressors.

Stories

Statistics help us understand the magnitude of maternal mortality but often fail to describe the humanity of the lives lost. We have a deep respect for the privacy and dignity of those who died, and while we cannot share their private lives, we can learn from their combined stories and the challenges they faced. In an attempt to share these stories with you—while protecting the identities and privacy of those who died—we present these fictitious narratives. The following stories of Grace, Lila, and Nadene do **not** reflect specific individuals, but highlight common experiences and challenges faced by those who lost their lives.

Grace's story

Grace entered the foster care system as a toddler and spent time with several families before she aged out of the system. She reconnected with her birth family and was introduced to methamphetamine not long after. Grace ended up in and out of jail and rehab facilities for a few years. While in jail, she enrolled in a substance use treatment program but was unable to continue treatment when she was released. She had no place to go and struggled to find a job.

Grace soon found out she was pregnant. It was not easy, but for the sake of her baby, Grace stopped using drugs. Still unable to find a job, she lived with her family but they were not very supportive and continued to use drugs around her. She delivered a healthy baby boy—and with no other options—they continued to live with her family. Grace was exhausted from taking care of her newborn and stressed about providing for her son. Several weeks after her delivery, a family member offered her some pills, and she could not resist the opportunity to numb her pain. She took 3 pills as she had always done. Shortly after she was found on the bathroom floor. She was not breathing, so her family called for an ambulance. EMS gave Grace naloxone and took her to the hospital, but she suffered a serious brain injury and died a short time later from an accidental drug overdose.

What can we learn from Grace's death?

Accidental overdose is one of the leading causes of pregnancy-associated deaths in Utah. Overdose is often multifaceted, with many contributing factors and ways to reduce one's risk of overdose. Grace's story highlights common stressors we see in maternal deaths, including unemployment, childhood trauma, child protective services involvement, and financial barriers (safe housing). Substance use treatment is often fragmented, but we know that good care coordination leads to better health outcomes. Grace needed better care coordination upon exiting the jail system and after having her baby. She did not know she was at increased risk of harm if she returned to drug use, since she likely had a lower tolerance after abstaining from drug use during her pregnancy. Learn more about strategies for preventing deaths similar to Grace’s death in the recommendations section of this report.

Lila's story

Lila was 33 years old and pregnant for the very first time. She was excited but scared. Lila worried about how she would afford childcare and how much time she would be able to take off since her job did not offer paid maternity leave. Unfortunately, Lila experienced a difficult pregnancy. She had to go to the emergency room for bleeding and frequent vomiting. She was afraid to take too many days off work knowing she needed to save her sick leave for once her baby came. During her second trimester, Lila's blood pressure rose higher and she was hospitalized for 2 days. When she got home, Lila panicked about her dwindling sick leave and how they would pay the hospital bills.

Toward the end of her pregnancy, Lila's baby went into distress and she had an emergency Cesarean delivery. Fortunately, the baby was healthy and Lila loved being a mom despite feeling like she'd been hit by a truck. She returned to work 2 weeks after delivery. Lila opted to work the early morning shift, starting at 5 a.m. to minimize the hours she needed to pay for childcare. A few days after being back at work, Lila noticed her leg was aching and felt warm so she phoned her doctor. They recommended she go to the emergency room for a workup. Lila remembered the bill she still owed from last time, and having no more paid sick leave, she decided to wait until her OB visit the following week. Later that night she was found unresponsive by her husband and pronounced dead at the hospital. Lila had a large clot in her leg and died from a pulmonary embolism.

What can we learn from Lila's death?

Many people cannot afford to take unpaid leave. Paid leave during pregnancy and after birth is necessary to receive appropriate healthcare. Childcare costs are increasing in Utah and many families are struggling to find affordable, quality childcare. Financial barriers to care also need to be eliminated as the fear of large hospital bills impacts how and when people seek care. Additionally, pregnant and postpartum people and their loved ones should be educated about the signs and symptoms of urgent, life-threatening pregnancy complications. Learn more about strategies to prevent deaths similar to Lila's death in the recommendations section of this report.

Nadene's story

Nadene was shocked to find out she was pregnant with her 3rd child just 6 months after her 2nd baby was born. Nadene had been referred to a low-cost clinic for birth control, but with 2 small children and no car, she was unable to get to the clinic. During her prenatal appointments, Nadene's doctor assessed her medically but did not screen for mental health conditions or other social risk factors. Nadene's doctor didn't think she seemed at risk for any mental health issues and Nadene didn't tell them how she was spending her nights sitting near her infant's crib anxious that he might stop breathing. She wasn't sleeping well and was more irritable and angry with her family than normal.

At her next prenatal care visit, she hesitantly brought up her worries to her doctor. They started her on medication and gave her a referral to a counselor. Nadene quickly lost hope after calling all the counselors her doctor suggested only to be told they were not taking new patients and did not accept her insurance. She started taking the medication but found it made her so nauseous she couldn't keep it down. She was not screened for mental health conditions at any of her other visits and Nadene didn't mention her increasing depression.

Nadene delivered a healthy baby at 39 weeks. While in the hospital, a mental health screening indicated Nadene had symptoms of a peripartum mood disorder. A social worker helped her find a therapist who could provide care under her insurance. Nadene saw her new therapist after delivery and was not doing well with little sleep and 3 small children. She tried to keep her visits, but it was hard for her to find someone to watch her kids and to find a ride. At 8 weeks postpartum Nadene's insurance deductible reset. She had 2 more mental health visits but soon began receiving large bills. Nadene felt like a burden to her family already and they couldn't afford the bills so she stopped going to therapy. Seven months after her infant was born, Nadene died by suicide.

What can we learn from Nadene's death?

Suicide is a leading cause of maternal death in Utah. Anyone can suffer from a mental health condition. It is important to screen everyone for depression and anxiety throughout pregnancy and postpartum, and make appropriate referrals and connections to care. We also need to increase the number of mental health providers in Utah. Insurance policies, coverage limitations, and high deductibles create barriers to care, especially for those suffering from a mental health condition. People also need financial support so they can best care for themselves and their families. We should prevent access to lethal means among those at risk of self-harm. Learn more about strategies for preventing deaths similar to Nadene's death in the recommendations section of this report.

Recommendations and prevention opportunities

The Maternal Mortality Review Committee (MMRC) draws upon member expertise to craft recommendations to prevent future maternal deaths. Recommendations are made at individual, provider, facility, community, system, and policy levels to address factors that contribute to maternal deaths. Recommendations are shared with key stakeholders, including hospitals, clinics, and the Utah Women and Newborns Quality Collaborative. We recognize that many groups must work together to protect Utah mothers. These recommendations and strategies do not necessarily represent the views of the Utah Department of Health and Human Services (DHHS) or the state of Utah. The MMRC encourages stakeholders to review these recommendations and identify where they can contribute to efforts to eliminate preventable maternal deaths. Some recommendations in this report may already be implemented since there is a time lag between when the death occurred and the publication of this report. Recommendations were qualitatively analyzed and the following themes emerged:

1) Build healthier communities.

2) Provide quality healthcare.

3) Mental healthcare is preventive.

4) Improve our response to substance use.

1 Build healthier communities.

Health begins where we live, learn, work, and play. Healthy pregnancies begin in our communities, long before entry to prenatal care. Everyone should have the opportunity to live and work in a safe place, and have access to affordable housing, food, transportation, childcare, and healthcare.

Payors, policymakers, and government should use a multi-faceted approach to increase access to healthcare and create healthier communities.

- Make sure housing, transportation, and healthy food are accessible and affordable.
- Expand Medicaid eligibility for pregnant and postpartum individuals (Utah expanded Medicaid coverage in 2023, Utah Code 26B-3-228).
- Make sure everyone has access to affordable healthcare, including coverage for contraception, mental health, and substance use disorder treatment.
- Increase funding and infrastructure for telehealth services.
- Increase the capacity of behavioral health clinics in rural areas.
- Minimize barriers to enrolling in social services.
- Make sure high-quality childcare is readily available and affordable.
- Eliminate factors that contribute to health inequities.

Facilities should make interpreters available at all interactions as needed by patients.

Communities should build support systems for pregnant and postpartum individuals, including peer support, home visiting, and community health worker programs.

2 Provide quality healthcare.

Our healthcare system is complex and can be difficult to navigate. Successfully managing health conditions, especially during pregnancy and postpartum, requires layers of support and care coordination. Careful review of maternal deaths identified opportunities to more effectively prevent and treat medical conditions.

Improve care for medical and obstetric conditions.

Providers should pursue diagnosis and treatment of chronic and significant diseases—even those that may be unrelated to pregnancy—in a timely manner during pregnancy and postpartum. **Providers** should offer comprehensive family planning counseling to all patients at risk of unintended pregnancy.

The **public health system and providers** should educate people on the warning signs of pregnancy and postpartum complications. People do not always know what symptoms signify a serious problem. Learn more about the urgent maternal warning signs and the Hear Her campaign on page 28.

Medical systems should develop standardized peripartum anticoagulation protocols, including appropriate dosing for people who are obese. **Providers** should help patients navigate barriers to anticoagulation therapy and counsel about the importance of anticoagulation.

Improve postpartum care.

Providers should follow up when a patient misses postpartum visits and refer to home visiting and care management for additional support.

Hospitals should connect families to social support when infants are in the NICU.

Improve care coordination.

Providers should fully document every visit and be aware of care provided by others to better coordinate treatment, especially medications. The **Utah Health Information Network** should do outreach with providers to increase awareness, use, and access to the clinical health information exchange (cHIE).

Health systems should provide care coordination to manage care among obstetric, substance use disorder, and mental health providers.

Hospitals and providers should facilitate the transition from inpatient to outpatient management of chronic conditions, including postpartum follow-up with caseworkers, community health workers, and social services.

3 Mental healthcare is preventive.

Mental health conditions contributed to nearly half of all maternal deaths in Utah. By treating mental health conditions, addressing trauma, and minimizing stress, we can improve many aspects of a person's health and well-being, and prevent self-harm.

Improve screening for trauma and social determinants of health.

The **public health system** should educate schools and providers about the potential impact of adverse childhood experiences (ACEs). The **public health system** should educate families on ways to improve resilience.

Health systems should train providers and staff on how to be trauma-informed. **Providers** should screen all patients for current and past trauma.

Providers should recognize social and emotional stressors as risk factors for poor health outcomes and self-harm. The following stressors were commonly highlighted in Maternal Mortality Review Committee recommendations:

- Incarceration
- History of sexual abuse
- Financial stress
- Chronic pain

Government should increase funding and support to assist survivors of violence.

Improve perinatal mental health screening and treatment.

Providers should use a validated tool to screen for mental health conditions at every prenatal and postpartum visit, including after pregnancy loss. **Providers** should refer patients with a warm handoff (contacting the agency or provider on the client's behalf) when a patient has a concerning mental health screening.

The **public health system** should train providers how to respond to a concerning mental health screening.

Government should increase funding for mental health treatment facilities that specialize in pregnant and postpartum individuals.

Social workers who meet with pregnant and postpartum patients should address mental health concerns and create suicide prevention plans.

3 Mental healthcare is preventive.

Suicide prevention - awareness, education, and care.

The **public health system** should educate families on how to help someone who may be thinking of suicide, the importance of seeking immediate care, and removing access to lethal means (guns and prescription drugs). Visit liveonutah.org for information on statewide efforts to prevent suicide.

Families should prevent access to lethal means by securely storing guns and medications away from those at risk of self-harm. **Communities** should make voluntary, temporary gun storage options available for those in a mental health crisis. **Government** should enact extreme risk laws to allow quick intervention when a person is at serious risk of harming themselves or others with a gun.

Providers should screen all patients for access to lethal means when a mental health diagnosis has been made.

Providers should always prescribe the smallest effective amount for lethal medication like opioids. **Providers and pharmacists** should give information on crisis lines when prescribing or dispensing lethal medications.

4 Improve our response to substance use.

Substance use contributed to nearly 4 out of 10 maternal deaths in Utah. The Maternal Mortality Review Committee identified opportunities to improve how we prevent and treat substance use disorders. A multi-level approach is necessary to make sure screening and early intervention efforts are successful. We need to reduce stigmas associated with substance use so we can better support, refer, and treat pregnant and postpartum patients with substance use disorder.

Screen and appropriately treat substance use disorder.

The **public health system** should collaborate with substance use treatment programs to address the specific needs of the perinatal population.

Hospitals and payers should remove barriers to treatment, including exclusionary hospital readmission policies.

Providers should screen for substance use disorder using a validated tool during each trimester and at each postpartum and well-baby visit. **Clinics, hospitals, and providers** should refer women with substance use disorder to treatment at every opportunity.

Providers should not attempt to taper substance use disorder medication for severe opioid use disorder in pregnancy.

Strengthen peer support.

The **public health system** should educate providers and families about free support services, including peer support for those with substance use and mental health conditions.

Hospitals and payers should connect patients and families to substance use peer support programs.

4 Improve our response to substance use disorder.

Awareness, education, and access to opioid reversal and overdose prevention.

The **public health system** should educate the public about the signs and symptoms of an overdose, what to do when an overdose is suspected, when and how to use naloxone, and the potential fentanyl contamination of illicit drugs.

The **public health system** should increase access to harm reduction tools and provide naloxone and fentanyl test strips to friends and family members of those with opioid use disorder. **Hospitals and providers** should educate patients with opioid use disorder on harm reduction strategies and provide them with naloxone at discharge.

Government should implement warning labels on medications that have the potential to cause a fatal overdose and require packaging that makes it more difficult to quickly access large quantities of medications.

Providers should always counsel and offer alternative pain management options when addressing postoperative and postdelivery pain relief.

Improve care coordination between social services and local agencies.

The **Division of Child and Family Services (DCFS)** should facilitate support for parents with substance use disorders.

Jails should screen for substance use disorder and mental health conditions at entry and continue to monitor for these conditions. **Jails** should initiate or continue treatment for opioid use disorder. **Jails** should make sure incarcerated people are connected with substance use treatment and social support at the time of release.

Public service agencies should strengthen case management for people with substance use disorder and mental health conditions.

Moving forward

It is our hope this report helps readers better understand how we can prevent maternal deaths. We will continue to work to improve our understanding of how maternal deaths happen in Utah and to promote prevention efforts.

What are we currently doing to improve maternal health?

Utah Women and Newborn Quality Collaborative (UWNQC)

The Utah Perinatal Quality Collaborative is a statewide network of professionals, hospitals, and clinics dedicated to improving the health of Utah women and babies using evidence-based guidelines and quality improvement processes. Through committees, they work on maternal topics and create statewide resources, such as the Maternal Resource Guide. UWNQC has conducted focus groups in Latina/Hispanic, Native Hawaiian/Pacific Islander, and Black communities to better understand how to improve pregnancy and birth experiences. Efforts are currently concentrated in 5 areas: health disparities, out-of-hospital births, maternal mental health, neonatal outcomes, and AIM patient safety bundles.

Alliance for Innovation on Maternal Health (AIM)

The Alliance for Innovation on Maternal Health is a quality improvement initiative to support best practices that make birth safer, improve maternal health outcomes, and save lives through the implementation of patient safety bundles. Patient safety bundles are a structured way to improve the process of care and patient outcomes. Utah has been an AIM state since 2016 and participating Utah hospitals have implemented the following patient safety bundles: care for pregnant and postpartum people with substance use disorder, severe hypertension in pregnancy, and obstetric hemorrhage. AIM offers Urgent Maternal Warning Signs for patients which is available in more than 75 languages, along with resource kits on Obstetric Emergency Readiness and Maternal Early Warning System Implementation.

Hear Her Campaign

The Hear Her campaign raises awareness of the urgent warning signs during and after pregnancy to improve communication between patients, families, and healthcare providers. Utah has distributed more than 8,000 magnets with the urgent maternal warning signs to clinics, providers, and individuals attending community events.

Maternal Mortality Symposium

More than 100 clinicians, public health professionals, and advocates of maternal health attended the first Utah-Wyoming Maternal Mortality Symposium. Together we learned about the current trends in maternal mortality in our states and discussed innovative solutions to prevent future deaths.

Learn more about these programs at https://mihp.utah.gov/.

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Appendix A

Supplemental data tables.

Table A-1. Maternal Mortality Review Committee determination of pregnancy-relatedness, Utah 2017–2020.

	Number (n=87)	Percent
Was the death related to pregnancy? [1]		
Yes, related to pregnancy	38	43.7%
No, not related to pregnancy	43	49.4%
Unable to determine	6	6.9%

1. The multidisciplinary Maternal Mortality Review Committee determines if the death was related to pregnancy. A pregnancy-related death is a death during or within one year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.

Data source: Utah Perinatal Mortality Review Program data, 2017–2020.

Table A-2. Timing and preventability of pregnancy-associated and pregnancy-related deaths, Utah 2017–2020.

	Pregnancy-associated deaths		Pregnancy-related deaths [1]	
	Number (n=87)	**Percent**	**Number** (n=38)	**Percent**
Timing of pregnancy				
Died while pregnant	14	16.1%	5	13.2%
Died on day of delivery	5	5.8%	4	10.5%
Died 1-42 days after pregnancy	15	17.2%	10	26.3%
Died 43-365 days after pregnancy	53	60.9%	19	50.0%
Was the death preventable? [2]				
Yes, preventable	62	71.3%	31	81.6%
No, not preventable	23	26.4%	7	18.4%
Unable to determine	2	2.3%	--	--

1. The multidisciplinary Maternal Mortality Review Committee (MMRC) determines if the death was related to pregnancy. A pregnancy-related death is a death during or within one year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. Pregnancy-related deaths are a subset of pregnancy-associated deaths.
2. The MMRC determines if the maternal death was preventable. A death is considered preventable if there was at least some chance of the death being prevented by one or more reasonable changes to patient, family, provider, facility, system, or community factors.

Data source: Utah Perinatal Mortality Review Program data, 2017–2020.

Table A-3. Cause of death for pregnancy-associated and pregnancy-related deaths, Utah 2017–2020.

	Pregnancy-associated deaths		Pregnancy-related deaths[1]	
	Number (n=87)	**Percent**	**Number** (n=38)	**Percent**
Cause of death				
Accidental drug overdose	16	18.4%	5	13.2%
Cardiomyopathy	7	8.0%	7	18.4%
Cardiovascular and coronary conditions	5	5.7%	3	7.9%
Cerebrovascular accidents (stroke)	4	4.6%	2	5.3%
Embolism	5	5.7%	4	10.5%
Homicide	4	4.6%	0	0.0%
Infection	3	3.4%	2	5.3%
Injury[2]	10	11.5%	0	0.0%
Other medical conditions[3]	9	10.3%	2	5.3%
Other obstetric complications[4]	4	4.6%	4	10.5%
Suicide	16	18.4%	9	23.7%
Unknown	4	4.6%	0	0.0%

1. Pregnancy-related deaths are a subset of pregnancy-associated deaths. The multidisciplinary Maternal Mortality Review Committee determines if the death was related to pregnancy. A pregnancy-related death is a death during or within one year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.
2. Injury includes accidental injuries related to motor vehicles and falls.
3. Other medical conditions include cancer, kidney disease, respiratory disease, liver disease, and seizure disorder.
4. Other obstetric complications include amniotic fluid embolism, hemorrhage, and eclampsia.

Data source: Utah Perinatal Mortality Review Program data, 2017–2020.

Appendix B

Understanding maternal mortality defintions.

Maternal mortality definitions have changed over time, in part due to our improved understanding of what causes these deaths and improved data collection. Different agencies also use different definitions. Maternal mortality definitions may differ in timing (up to 42 days postpartum or through 1 year postpartum) or cause of death (include or exclude accidental causes). More information is provided on some of the most commonly used definitions of maternal mortality. Care should be taken when comparing Utah maternal mortality rates to global, national, or other state rates.

National Center for Healthcare Statistics (NCHS) and World Health Organization (WHO)

The National Center for Healthcare Statistics and the World Health Organization define maternal mortality as the death of a woman while pregnant or within 42 days of termination of pregnancy (irrespective of the duration and the site of the pregnancy) from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. This definition only includes deaths with the underlying cause of death assigned to the International Statistical Classification of Diseases, 10th Revision (ICD-10) code numbers A34, O00–O95, and O98–O99.[1]

Pregnancy Mortality Surveillance System (PMSS)

In the Pregnancy Mortality Surveillance System, a pregnancy-related death is defined as the death of a woman while pregnant or within 1 year of the end of pregnancy regardless of the outcome, duration, or site of the pregnancy—from any cause related to or aggravated by the pregnancy or its management. Pregnancy-related deaths as defined in this surveillance system generally do not include deaths due to injury.[2]

Utah Perinatal Mortality Review (PMR) program

The Utah Perinatal Mortality Review program distinguishes between pregnancy-associated and pregnancy-related deaths. Pregnancy-related deaths are a subset of all pregnancy-associated deaths. We rely on the expertise of our multidisciplinary Maternal Mortality Review Committee to determine if the maternal death was related to pregnancy. We define a pregnancy-related death as a death during or within one year of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. This definition allows us to consider injury deaths as related to pregnancy. Many other state maternal mortality prevention programs use this definition.[3]

1. Hoyert DL. Maternal mortality rates in the United States, 2021. NCHS Health E-Stats. 2023.
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3. "Working together to prevent maternal mortality." Review to Action. https://reviewtoaction.org.