Maternal, Fetal, and Infant Mortality Review Panel

Annual Report

State Fiscal Year 2023

Required by:
22 MRS § 261

Prepared by:
Maternal and Child Health Program
Maine Center for Disease Control and Prevention
Department of Health and Human Services

INTRODUCTION

The Maine Center for Disease Control and Prevention's (Maine CDC) Maternal, Fetal and Infant Mortality Review (MFIMR) Panel is a multidisciplinary group of health care and social service providers, public health officials, and other persons with professional expertise in maternal, fetal, and infant health, and mortality. Appointed MFIMR Panel members are authorized to review summary information relevant to maternal and infant death case reviews. The Panel's purpose is to gain an understanding of the factors associated with fetal, infant, and maternal deaths to expand the State's capacity to direct prevention efforts and be able to take actions to promote the health and wellbeing of Maine's families. (22 MRS § 261.) Using a public health approach, the overarching goal is to strengthen community resources and enhance state and local systems and policies affecting women, infants, and families to improve health outcomes in this population and prevent maternal and infant mortality and morbidity. This State Fiscal Year (SFY) 2023 report summarizes activities and relevant data contributing to pregnancy outcomes, and outlines the activities, recommendations, and plans for the MFIMR Panel.

BACKGROUND and HISTORY

Pursuant to PL 2005, chapter 467, the Department of Health and Human Services (Department) established a maternal, fetal, and infant death review panel to review data presented on cases of maternal and infant deaths, which, initially, included all cases of women who died during pregnancy or within 42 days of giving birth and the majority of deaths of infants under one year of age. The Panel is charged with presenting, annually, a report of findings related to factors contributing to maternal and infant death in the State and recommendations to decrease the rate of maternal and infant death.

The 124th Maine Legislature enacted emergency legislation (PL 2009, chapter 531), amending the statute to authorize the Maternal and Infant Death Review Panel to review fetal deaths occurring after 28 weeks gestation (stillborn infants). With this change, the Panel was referred to as the Maternal, Fetal and Infant Mortality Review (MFIMR) Panel, formally changed in statute in 2017. Additionally, the Panel's sunset provision was repealed effectively in 2010, allowing the Panel to continue its work beyond the original end date of January 1, 2011.

PL 2017, chapter 402 amended 22 MRS § 261, sub-§ 4 by repealing the provision requiring the Panel Coordinator to obtain permission from the family prior to accessing health care records of a woman who died during pregnancy or within 42 days of giving birth, a child who died within one year of birth, including fetal deaths after 28 weeks of gestation.

In its SFY 2019 Annual Report, the Panel recommended statutory changes to include access by the Panel Coordinator to health care information for maternal deaths up to one year following the birth of a child, in accord with the guidance of the national CDC Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) program[1]. This change was approved by the Legislature and reviews expanded the following year. (PL 2019 chapter 671.)

[1] The Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) Program supports agencies and organizations that coordinate and manage Maternal Mortality Review Committees; https://www.cdc.gov/reproductivehealth/maternal-mortality/erase-mm/index.html

In 2021, the Maine Medical Association Center for Quality Improvement (MMA-CQI), in cooperation with the Maine CDC, applied for U.S. CDC grant funding under the ERASE MM program. MMA-CQI was awarded this 2-year grant beginning September 30, 2022, allowing for the expansion of capacity to review all maternal deaths and increase the timeliness, accuracy, and standardization of information available about pregnancy-related deaths, and increase the availability of the Panel's recommendations to communities, clinicians, and policymakers.

ACKNOWLEDGEMENTS

The MFIMR Panel would like to thank the following groups and people who made this past year's work possible:

- Our supporters at the US CDC and the NCFRP, especially Christine Cooper-Nowicki & Rosemary Fournier for their abundant resources and technical support.
- The staff at the Maine CDC, Maryann Harakall, Meghan Henshall, Fleur Hopper, Andrea Lenartz, and Anne Watson who were vital in the writing of this report and the behind the scenes of MFIMR operations.
- Our partners at the MMA-CQI, Mariah Pfeiffer, Kelley Bowden, Liz Winterbauer, and who contributed to the writing of this report and the running of MFIMR generally.
- All members of the MFIMR Panel past, present and future for their devotion to objective reviews of the tragedies of our beloved state and ongoing work to recommend prevention efforts.

We honor all Mainers who have experienced a fetal, infant, or maternal loss.

EPIDEMIOLOGY REPORT

In support of the MFIMR Panel, funding is provided for epidemiologic analyses of maternal, fetal, and infant mortality through the Maternal and Child Health Block Grant (MCHBG) and the ERASE MM grant to help the Panel understand risk factors and trends associated with maternal, fetal, and infant mortality. MFIMR epidemiologists have conducted quarterly analyses of provisional vital records data for infant deaths and annual analyses of vital records data for fetal deaths and pregnancy-associated deaths.

Fetal Death Summary

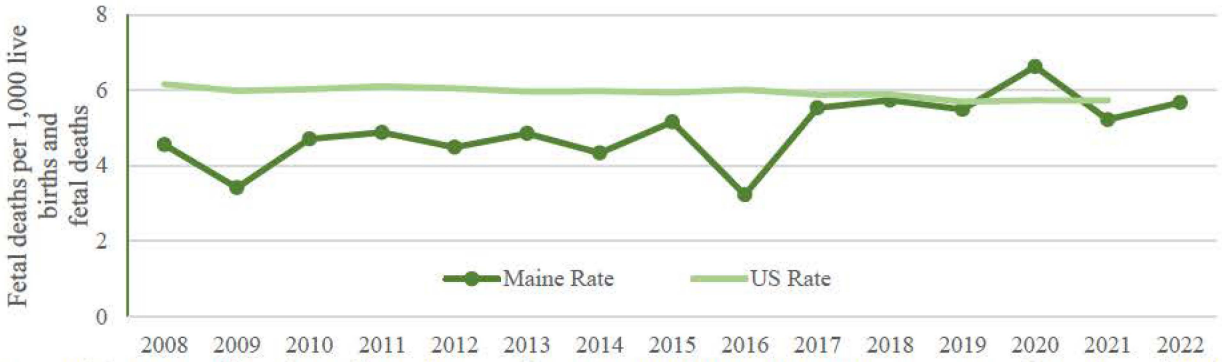
A fetal death is the spontaneous death of a fetus in utero that occurs at 20 weeks of gestation or later. *Early fetal deaths* are those occurring between 20-27 weeks gestation, *late fetal deaths* are those occurring at 28 or later weeks gestation. In Maine, healthcare providers are required to complete a fetal death certificate and register any fetal death occurring at 20 weeks or later. While the following summary includes all 2022 fetal deaths registered with Maine CDC – Data, Research and Vital Statistics (DRVS), the MFIMR Panel reviews only late fetal deaths.

In 2022, there were 69 fetal deaths among Maine residents, 23 of these were late fetal deaths. The State's 2022 fetal mortality rate was 5.7 fetal deaths per 1,000 live births plus fetal deaths to Maine residents, a 10% increase from the 2021 fetal mortality rate of 5.2. Maine's 2022 early

fetal mortality rate was 3.5 per 1,000 live births plus fetal deaths, and the late fetal mortality rate was 1.9 per 1,000 live births plus fetal deaths.[2]

In 2021, the most recent year available for comparison, the U.S. total fetal mortality rate was 5.7 fetal deaths per 1,000 live births plus fetal deaths, the early fetal mortality rate was 3.0 and the late fetal mortality rate was 2.8.[3]

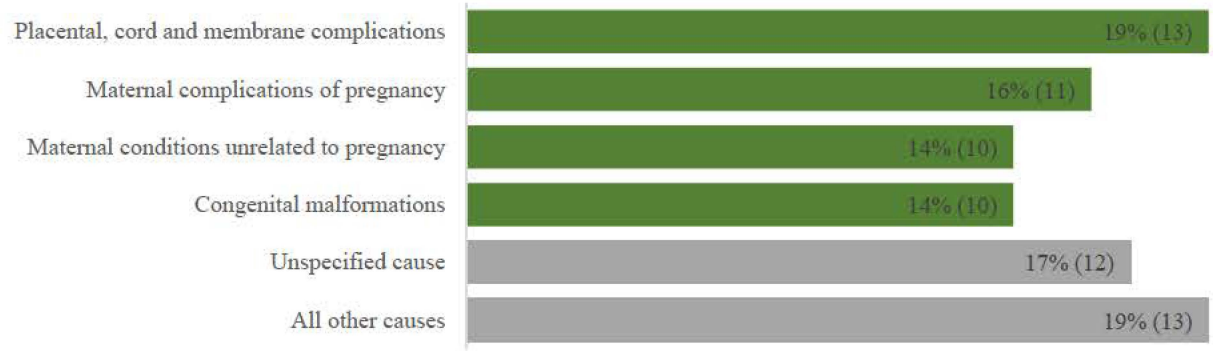
Figure 1. Fetal mortality rate, Maine and US, 2008 – 2022



Source(s): US: Birth and Fetal Death Records, CDC WONDER; ME 2022: Maine Fetal Death and Birth certificates, DRVS

Major causes of fetal death in the United States include complications of the placenta or umbilical cord, complications of pregnancy, and congenital anomalies. Across the US, a large proportion of fetal death certificates are registered with an unspecified cause (about 31%).[4] In 2022, 19% of Maine fetal deaths were due to placental, cord, or membrane complications; 19% were due to other causes; and 12% were due to an unspecified cause.

Figure 2. Initiating causes of fetal deaths (ICD-10), Maine, 2022



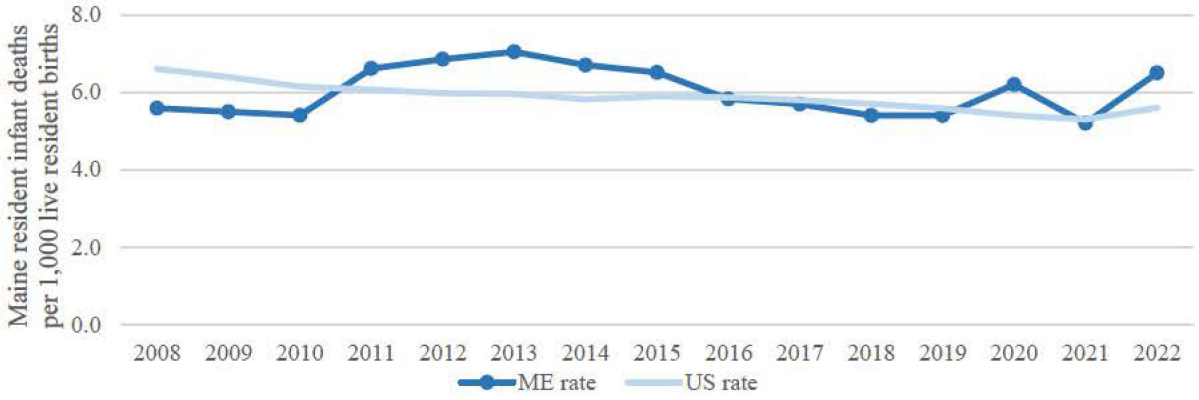
Source: Maine Fetal Death Certificates, DRVS

Infant Death Summary

[2] Fetal deaths for which gestational age was unknown were excluded from both the numerator and denominator when calculating early and late fetal mortality rates.
[3] Gregory ECW, Valenzuela CP, Hoyert DL. Fetal mortality: United States, 2021. National Vital Statistics Reports; vol 72 no 8. Hyattsville, MD: National Center for Health Statistics. 2023.
[4] Gregory ECW, Valenzuela CP, Hoyert DL. Fetal mortality: United States, 2021. National Vital Statistics Reports; vol 72 no 8. Hyattsville, MD: National Center for Health Statistics. 2023.

Infant death is defined as any death to a live born infant prior to their first birthday. After declining between 2020 and 2021, Maine's infant mortality rate increased in 2022 to the highest it has been since 2015. In 2022, there were 79 deaths among Maine resident infants, and the State's infant mortality rate was 6.5 deaths per 1,000 live births to Maine residents (Figure 3). The Maine 2022 infant mortality rate exceeded the US 2022 infant mortality rate of 5.6 deaths per 1,000 live births.

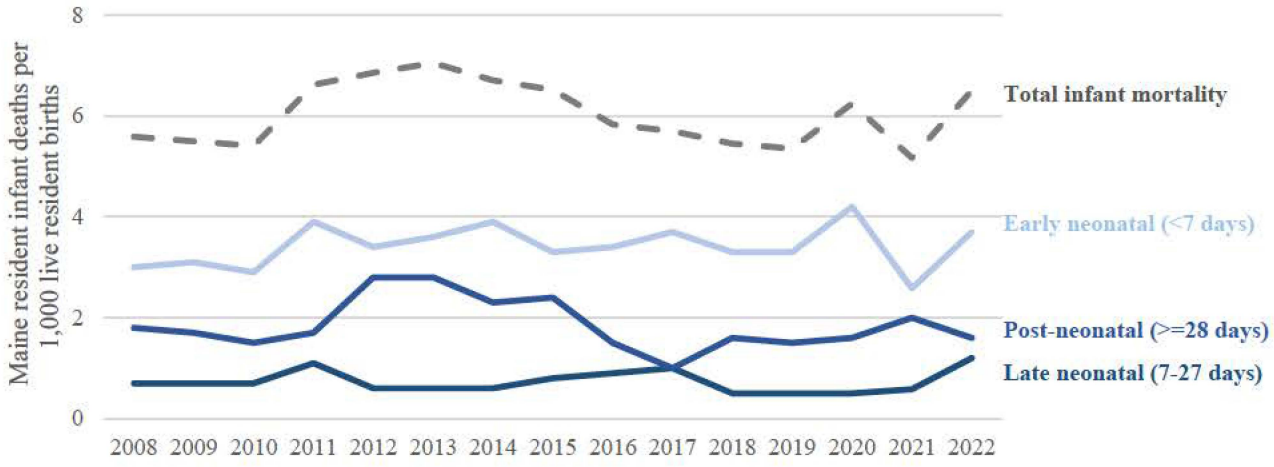
Figure 3. Infant mortality rate, Maine and US, 2008-2022



Source(s): US: Linked Birth / Infant Death Records, CDC WONDER; Maine: Death and Birth certificates, DRVS

A majority of Maine's infant deaths occur in the early neonatal period (i.e., between 0-6 days of life). In 2022, 57% of Maine infant deaths occurred during the early neonatal period. The increase in Maine's total infant mortality rate between 2021 and 2022 was driven largely by the increase in early neonatal mortality (Figure 4).

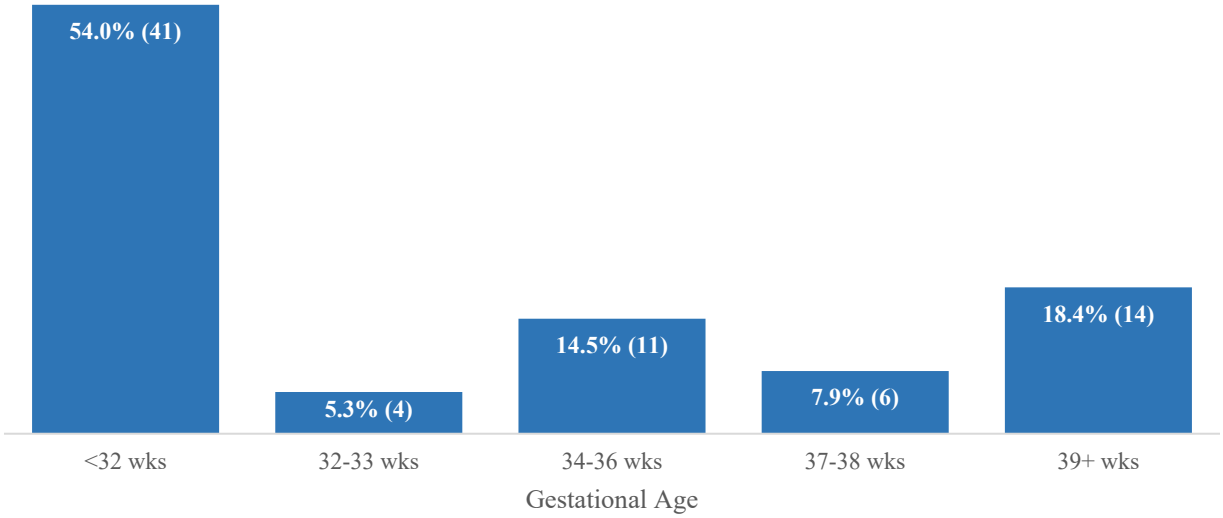
Figure 4. Infant mortality rate by age group, Maine, 2008-2022



Source: Maine CDC Death and Birth certificates

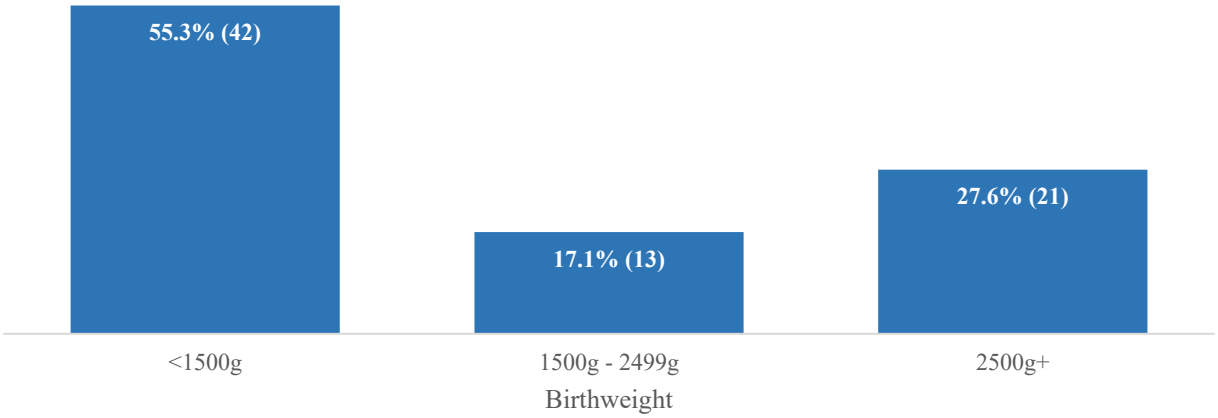
Preterm and low birthweight infants are at increased risk of morbidity and mortality compared to their term and normal birthweight peers.[5] In 2022, more than one in two deaths occurred among infants born before 32 weeks gestation (Figure 5). Over half of infant deaths occurring in 2022 were among infants weighing less than 1,500 grams (g) at birth (Figure 6).

Figure 5. Proportion and count of infant deaths by gestational age at birth, Maine, 2022*



*Infant deaths for which gestational age was unknown were excluded from both the numerator and denominator of proportion calculations. *Source: Linked Birth-Death Certificates, DRVS*

Figure 6. Proportion and count of infant deaths by weight at birth, Maine, 2022*



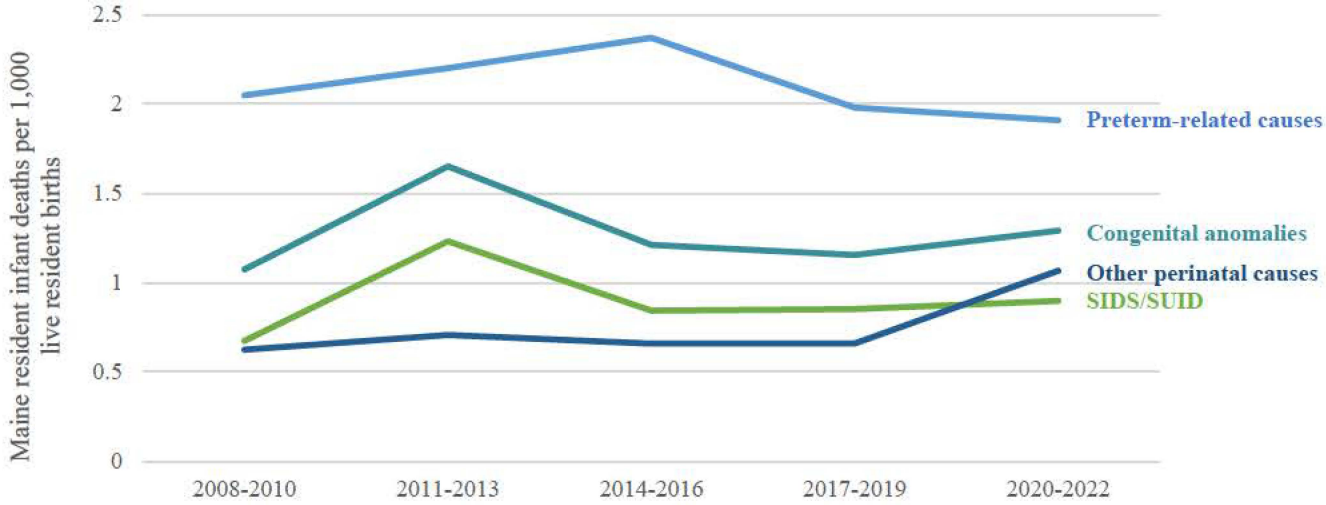
*Infant deaths for which birthweight was unknown were excluded from both the numerator and denominator of proportion calculations. *Source: Linked Birth-Death Certificates, DRVS*

The most common causes of infant deaths in Maine are preterm related. These are deaths to infants born at less than 37 weeks of gestation in which the cause of death was a direct

[5] Behrman RE and Butler AS, eds. Preterm Birth: Causes, Consequences and Prevention, National Academies Press: Washington, DC; 2007.

consequence of preterm birth. In 2022, 46% of deaths among infants born before 37 weeks gestation were due to a preterm-related cause. Congenital anomalies (i.e., birth defects) and Sudden Infant Death Syndrome (SIDS)/Sudden Unexpected Infant Death (SUID) have historically been the second and third most common causes of infant death in Maine. In 2020, the SIDS/SUID mortality rate in Maine dropped to its lowest level since 2008. However, in 2022, the SIDS/SUID rate increased to 1.4 infant deaths per 1,000 live births.

Figure 7. Leading causes of infant mortality, Maine, 2008-2022



Source: Linked Birth-Death Certificates, DRVS

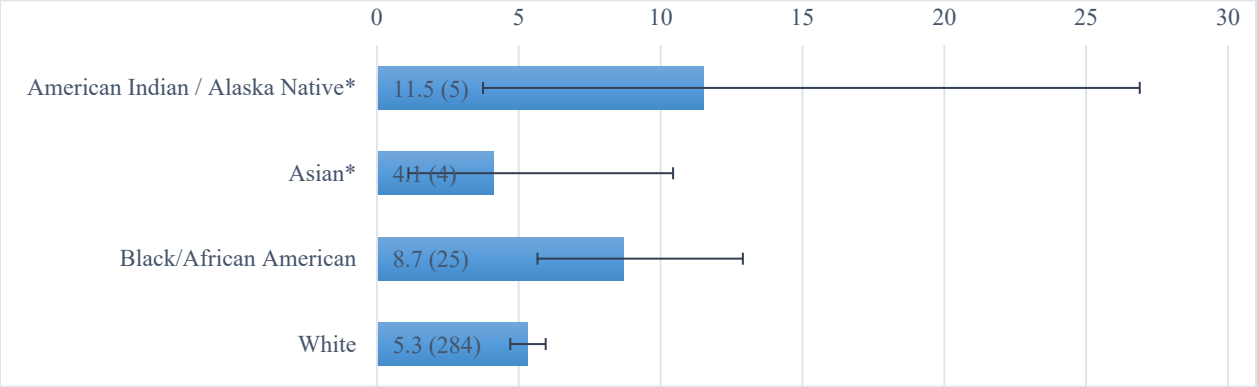
Infant mortality risk varies by demographic, geographic, socioeconomic, and maternal health factors. Smoking during pregnancy is associated with both preterm birth and low birthweight, as well as other poor birth outcomes and SIDS/SUID.[6] From 2018 to 2022, the mortality rate among infants born to Maine birthing persons who smoked during the last trimester of pregnancy was 9.4 deaths per 1,000 live births compared to the mortality rate among infants born to non-smoking birthing persons of 5.2 deaths per 1,000 live births.

In Maine, some population groups experience a disproportionately high rate of infant mortality. From 2018 to 2022, infants born to birthing persons with a high school diploma/GED or less education died at more than two times the rate of infants born to birthing persons with at least some college education (8.5 deaths per 1,000 births versus 4.2 deaths per 1,000 births, respectively). Infants whose births were covered by MaineCare (Medicaid) also experience a significantly higher mortality rate compared to infants whose births were covered by other payer types. Pregnant Maine residents are eligible for MaineCare coverage at incomes at or below 214% of the Federal Poverty Level. MaineCare coverage for a birth may be an indication that a birthing person had a low income in the prenatal period. From 2018 to 2022, the mortality rate among infants whose births were covered by MaineCare was 7.5 deaths per 1,000 births compared to infants whose births were covered by other payer types at 4.5 deaths per 1,000 births.

[6] U.S. Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014. Printed with corrections, January 2014.

Like the rest of the United States, infants born to Black/African American and Indigenous/ American Indian/Alaska Native birthing persons in Maine experience a higher mortality rate compared to white infants. Disparities in infant mortality by race in Maine and the US are due to complex and interrelated factors, including inequitable access to resources (e.g., quality healthcare, education, employment, housing) and other impacts of discrimination, structural racism, and colonialism.[7] From 2018 to 2022, the mortality rate among infants born to Maine resident Black/African American birthing persons was 8.6 per 1,000 live births; among infants born to Indigenous birthing persons it was 11.5 per 1,000 live births; among infants born to white birthing persons it was 5.3 per 1,000 live births; and among infants born to Asian birthing persons it was 4.1 per 1,000 live births (Figure 8).

Figure 8. Infant mortality rates per 1,000 live births and counts by birthing person race, Maine, 2018-2022



*Interpret with caution: rates calculated with fewer than 20 individuals in the numerator.
Note: Error bars represent 95% confidence interval.
Source: Linked Birth-Death Certificates, DRVS

Additional data on the prevalence of select risk factors for infant mortality among Maine residents, and additional infant mortality data stratified by demographic, maternal health status, and geographic factors, are included in Appendix A.

PREGNANCY-ASSOCIATED MORTALITY SUMMARY

There are several related concepts that describe deaths of birthing persons during or soon after the end of pregnancy. For the purposes of MFIMR, these are:

- Pregnancy-Associated Death: A pregnancy-associated death is any death to a birthing person while pregnant or within one year of the end of pregnancy, regardless of cause.

- Pregnancy-Related Death (ERASE MM definition): 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.

[7] Artiga S, Pham O, Orgera K, Ranji U. Racial Disparities in Maternal and Infant Health: An Overview: Issue Brief, Kaiser Family Foundation. https://www.kff.org/report-section/racial-disparities-in-maternal-and-infant-health-an-overview-issue-brief/. November 2020.

- Pregnancy-Associated, but Not Related Death: A death during or within one year of pregnancy, from a cause that is not related to pregnancy.

In 2021, there were nine pregnancy-associated deaths among Maine birthing persons.* One death occurred while the birthing person was pregnant, two occurred between delivery and 42 days post-delivery, and six deaths occurred between 43 and 365 days after the end of the decedent's pregnancy (Table 1).

Table 1. Timing of pregnancy-associated deaths, Maine, 2018-2021

Pregnancy status at time of death	2018	2019*	2020	2021**	Total
Pregnant at time of death	1	1	1	1	4
Pregnant within 0-42 days of death	1	0	0	2	3
Pregnant within 43-365 days of death	4	7	5	6	22
Total	6	8	6	9	29

* One pregnancy-associated death previously reported as occurring in 2019 was determined not to be pregnancy-associated by the US CDC Pregnancy Mortality Surveillance System in April 2023. Data on Maine's 2019 pregnancy-associated deaths have been updated accordingly.
** In the FY2022 MFIMR annual report, the total pregnancy-associated deaths occurring in 2021 was reported as 10. Based a review of medical records completed by the maternal morality review coordinator in 2023, one death was determined to have been misidentified as pregnancy-associated due to an error on the decedent's death certificate Data on Maine's 2021 pregnancy-associated deaths have been updated accordingly. Additionally, one pregnancy-associated death occurring in 2021 was reported on the death certificate as pregnant at the time of death, but upon review of the records, the death occurred between 0 and 42 days postpartum.

Based on the underlying cause of death data collected on Maine death certificates, in 2021, three of the nine Maine pregnancy-associated deaths were due to motor vehicle accidents, three were due to an obstetric cause, two were due to drug overdose, one was due to suicide. Causes of pregnancy-associated deaths for 2018–2021 are provided in Table 2. The Panel will also make a cause of death determination for all pregnancy-associated deaths beginning with deaths occurring in 2021. The cause of death determined by the Panel may differ from the cause of death listed on the decedent's death certificate. These data will be available in the next MFIMR report.

Table 2. Causes of pregnancy-associated deaths, per death certificate, Maine, 2018-2021

Causes of pregnancy-associated deaths	2018	2019	2020	2021	Total
Direct or indirect obstetric causes	2	2	1	3	8
Motor vehicle accidents	1	1	2	3	7
Accidental poisoning (overdose)	0	2	1	2	5
Suicide	1	1	0	1	3
Cardiovascular diseases	1	0	1	0	2
Homicide	0	2	0	0	2
Respiratory diseases	0	0	1	0	1
All other causes	1	0	0	0	1
Total	6	8	6	9	29

Substance use related deaths, including overdoses, account for a substantial proportion of pregnancy-associated mortality in the US.[8] In 2021, there were two pregnancy-associated deaths in Maine for which the underlying cause was a drug overdose. The Panel will determine whether substance use disorder contributed to the death for all deaths occurring in 2021 forward. These data will be included in the SFY 2024 report.

Pregnancy-associated mortality is a rare event in Maine, making analyses of demographic factors, geographic factors, or health and behavioral risk factors challenging due to very low numbers. However, many of the socioeconomic and demographic disparities and health status factors associated with fetal and infant mortality are also associated with pregnancy-associated mortality. According to linked vital records data, in 2018 to 2021:

- More than half of the 29 pregnancy-associated deaths occurred among decedents with a high school diploma or less education.
- 26 of the 29 decedents were white and three were Black or African American. There were no pregnancy-associated deaths among individuals whose race was recorded on any vital records document as Asian, American Indian/Alaska Native, Native Hawaiian or Other Pacific Islander, or any other specified race.
- All 29 decedents were reported to be non-Hispanic.
- Among decedents for whom a birth certificate for the associated birth was identified by Maine DRVS (n=24), 19 appear to have been insured by MaineCare/Medicaid for the associated birth, and 19 were residing in a rural area at the time of the associated birth.

PANEL ACTIVITIES

July 2022 - July 2023

22 MRS § 261 requires the Panel to meet at least twice in a state fiscal year, however, the panel members agreed upon meeting at least four times when possible. All meetings included review of the previous meeting's minutes, a provisional report from the Maine CDC Maternal and Child Health (MCH) Epidemiologist on most recent deaths (fetal and maternal deaths provided on an annual basis, infant deaths reported quarterly), updates from the Panel Coordinator and members, and case reviews.

The SFY 2023 meetings were held virtually over Zoom and took place as follows:

- July 19, 2022, 1-4pm
- October 18, 2022, 1-4pm
- January 17, 2023, 1-4pm
- May 3, 2023, 1-4pm

[8] Campbell J, Matoff-Stepp S, Velez ML, Cox HH, Laughon K. Pregnancy-Associated Deaths from Homicide, Suicide, and Drug Overdose: Review of Research and the Intersection with Intimate Partner Violence. J Womens Health (Larchmt). 2021;30(2):236-244

Reviews consisted of the following cases:

Fetal Death: Two 2020 deaths
Infant Death: Three 2021 deaths and four 2022 deaths
Maternal Death: Two 2021 deaths and one 2022 death

Other Notable Activities:

- Subject matter experts presented at the May meeting to add expertise to relevant case reviews.
- Trainings provided by epidemiologists on social determinants of health present in eight BIPOC infant deaths from 2021.
- Began using the federal CDC's "Review to Action" processes for maternal review with a focus on the "Who, What, When" process of recommendation per the national maternal mortality review committees (MMRCs) during the May meeting.

PANEL RECOMMENDATIONS

Note: these are recommendations discussed by the panel and are not necessarily supported or endorsed by the Maine Center for Disease Control and Prevention or Department of Health and Human Services. They do not reflect policy commitments, and further do not confer support from the Executive Branch for specific legislative initiatives. Policy proposals will be reviewed and commented on as they arise.

Over the course of four 3-hour meetings, the panel came up with 43 recommendations to address stillbirths and maternal and infant mortality. For a complete list of recommendations, see Appendix B. The following themes occur in the recommendations (these are not listed in order of priority):

1. Individualized Plan of Safe Care
    a. Include ongoing Safe Sleep education and provide community CPR training.
    b. Establish pediatrician appointments before hospital discharge.
    c. Educate on pregnancy spacing and promote family planning services.
    d. Expand outreach education for aspirin for patients at risk for hypertension.
2. Family Support Network
    a. Coordinate care and provide referrals to all social services (including substance-use disorder patient advocates).
    b. Expand doula support, in-home prenatal and postpartum care.
    c. Establish peer support system.
3. Provider Education
    a. Educate care providers in trauma-informed care.
    b. Provide ongoing training for emergency services personnel in obstetric care.
    c. Screen for domestic violence throughout pregnancy.
4. Panel Membership
    a. Continue to broaden diversity of Panel membership.
    b. Add a mental health provider.
    c. Add a MaineCare representative.

PANEL COORDINATOR ACTIVITIES July 2022 - July 2023

Funding support received from the US CDC's ERASE MM Grant, beginning in September 2022, allowed the Panel to increase capacity to review all maternal deaths in Maine, as well as to focus on creating a diverse and representative MFIMR Panel that can make clear, actionable recommendations to prevent maternal, fetal, and infant mortality. See Appendix C for more.

New Member Recruitment

- Completed a gap analysis of current Panel membership.
- Created a list of 40 ideal Panel members by role.
- Began the recruitment process for new members based on comparing our current members to the ideal list and filling any gaps.
- Made critical income loss stipends available for Panel members with lived experience.

Quality Improvement

- Began tracking Panel member satisfaction and comfort with making recommendations and participating in case discussion.
- Trained current Panel members on national Maternal Mortality Review Information Application (MMRIA) Committee Decisions Form and National Center for Fatality Review and Prevention (NCFRP) decision processes.
- Created a Charter to govern MFIMR Panel processes.
- Established quarterly Steering Committee meetings to evaluate panel work.
- Pre-reviewed cases with smaller clinical group to ensure completeness of abstraction and clarity of case summaries for larger Panel.
- Created job description and hiring plan for a full-time Panel Coordinator to increase Panel capacity and support.

Family Interviews

- Began developing a family interview protocol based on conversations with other states and reviewing ERASE MM materials.
- Created a job description and hiring plan for a social worker to assist us with increasing the number and quality of family interviews we can achieve.
- Established a contract with interpretive services organization to decrease language barrier for affected families.

Information Sharing

- Created an MOA for records release between MFIMR (Maine CDC) and Office of the Chief Medical Examiner (OCME).
- Established an information request processes between MFIMR and State agencies including Women, Infant, Children (WIC), Public Health Nursing (PHN), and the Office of Child Family Services (OCFS).
- Adapted new Community Vital Signs dashboards for case reviews, a project of the federal CDC and HHS Office of Minority Health.
- Entered maternal mortality data into the national MMRIA database.

PANEL PLANS AND GOALS FOR FY 2024

Full-time Panel Coordinator position

The successful completion of all MFIMR actions depends heavily on increased Panel resources in the form of a full-time Panel Coordinator. The Maternal Health Block Grant (MHBG) will allow the Maine CDC MCH program to hire a contracted full-time position for the fall of 2023 pending the right applicant. However, per statute, that position is to be held by a Maine CDC employee. During FY 2024, the Panel will continue to advocate for the full-time Panel coordinator position be hired as an employee of the State.

Informant Interviews

To date, there have been only a few interviews with families impacted by maternal, fetal, and infant mortality that have been incorporated into the full Panel review, despite statute that includes informant interviews as part of the MFIMR process. The Panel plans to hire a part-time bereavement professional to conduct interviews with families or friends. These stories of lived experience are crucial to fuller understanding of the systems of care that influence these fatal outcomes and give voice to communities impacted by loss. In FY 2024, the MFIMR staff will formalize an Informant Interview Protocol with the support of our federal partners at the US CDC and NCFRP and following approval by the State, begin implementing this protocol in full by the beginning of CY 2024.

MFIMR Retreat

This is challenging and emotionally charged work. MFIMR Panel members come together quarterly to review cases and form recommendations. These meetings have been virtual since 2020, initially due to COVID-19 precautions and continued for the purpose of wider geographic representation. It has been difficult to carve out time for crucial relationship and trust-building efforts that are needed to have comprehensive reviews where more people feel their voices will be heard, respected, and valued. With MMRC grant funding obtained, plans have been made to have an in-person half day “retreat” facilitated by a professional during FY 2024.

Panel Membership

Recruitment efforts continue for the Panel to ensure statewide representation of all stakeholders who provide services related to prevention and intervention efforts, especially with respect for disparities in outcomes. Workgroup for Charter Revisions to include term-limits and to be revised annually.

NFR-CRS Database

The Panel began to utilize case review forms developed by the national organizations that align with the maternal, fetal, and infant mortality review databases: ERASE MM MMRIA and NCFRP National Fatality Review-Case Reporting System (NFR-CRS). The nurse abstractor for the maternal mortality reviews began using the MMRIA database this year, however the Maine MFIMR is not currently participating in the national database for fetal and infant mortality. The goal for CY 2024 is to take the necessary steps to set up a Data Use Agreement (DUA) been Maine CDC and the NCFRP for use of the NFR-CRS.

Central Registry of Resources
Maine's Rules and Regulations Relating to the Maternal, Fetal and Infant Mortality Review Panel, 10-144 CMR chapter 700, requires the Panel Coordinator to maintain, for the public, a central registry of statewide resources dedicated to improving the health of mothers and infants by preventing birth defects, premature births, and maternal and infant mortality. Work to compile an updated list of perinatal bereavement support groups for the MFIMR webpage is underway. This resource will be reviewed for updates annually moving forward.

Bidirectional Conversations with Stakeholders, Communities Disproportionally Impacted, Individuals with Lived Experience
As part of the ERASE MM grant, the MFIMR staff will be developing a protocol for bidirectional conversations to build better relationships between communities and the work that MFIMR does. This is planned to be rolled out this next year.

Appendix A

INFANT MORTALITY DETAILED TABLES

Table A-1. Prevalence of select risk factors associated with infant mortality, Maine and US

Risk factor	Maine (year)	US (year)
Percent of births to birthing persons who smoked during pregnancy[1]	8.2% (2022)	4.6% (2021)
Percent of births to birthing persons with diabetes[1]		
Pre-pregnancy diabetes	1.3% (2022)	1.1% (2021)
Gestational diabetes	9.9% (2022)	8.3% (2021)
Percent of births to birthing persons with hypertension[1]		
Preexisting hypertension	8.6% (2022)	2.7% (2021)
Gestational hypertension	10.6% (2022)	9.1% (2021)
Percent of birthing persons who received late or no prenatal care[1]	4.3% (2022)	6.3% (2021)
Percent of births to birthing persons with a pre-pregnancy BMI of 30.0+ [1]	33.7% (2022)	30.8% (2021)
Percent of infants born low birthweight (<2,500 grams)[1]	8.2% (2022)	8.5% (2021)
Percent of infants born very low birthweight (<1,500 grams)	1.3% (2022)	1.4% (2021)
Percent of infants born preterm (<37 weeks gestation) [1]	9.6% (2022)	10.5% (2021)
Percent of births to birthing persons with HS diploma/GED or less education[1]	30.8% (2022)	36.5% (2021)
Percent of birthing persons who received WIC during pregnancy[1]	23.0% (2022)	29.9% (2021)
Percent of new birthing parents who experienced depression during pregnancy[2]	22.4% (2021)	16.5% (2021)
Incidence of neonatal abstinence syndrome (rate per 1,000 birth hospitalizations)[3]	20.5 (2020)	6.3 (2020)
Percent of new birthing parents who report always/often placing infant on back to sleep[2]	90.5% (2021)	81.1% (2021)
Percent of new birthing parents whose prenatal care was covered by Medicaid[2]	34.1% (2021)	35.3% (2021)
Percent of new birthing persons who had no insurance coverage for prenatal care[2]	1.5% (2021)	2.5% (2021)

Sources:
[1]ME: birth certificates, DRVS; US birth certificates, National Vital Statistics Reports Volume 72, Number 1, US CDC WONDER
[2]ME: Maine Pregnancy Risk Assessment and Monitoring Survey (PRAMS); US: PRAMS, participating US states
[3]ME: Maine Health Data Organization Inpatient Encounters; US: USDHHS Agency for Healthcare Research and Quality

Table A-2. Maine resident infant deaths by select factors, 2022

Maine 2022 Infant deaths	Count*	Percent (%)*
Total infant deaths	79	100%
Demographics of birthing persons		
Age of birthing person		
Under 25	17	22.4%
25-34	42	55.3%
35 and over	17	22.4%
Education of birthing person		
HS diploma/GED or less	37	51.4%
Some college or higher	35	48.6%
Ethnicity of birthing person		
Hispanic	2	2.6%
Non-Hispanic	74	97.4%
Race of birthing person		
White	63	84.0%
Black/African American	8	10.7%
American Indian/Alaska Native	0	0.0%
Asian	4	1.3%
Native Hawaiian or Other Pacific Islander	0	0.0%
Other race	1	1.3%
Two or more races	2	2.7%
Birthing person's country of birth		
US state or territory	66	86.8%
Elsewhere	10	13.2%
Birthing person received WIC during pregnancy		
Yes	24	32.0%
No	51	68.0%
Birthing person health status and access-to-care factors		
Pre-pregnancy weight (4-level)		
Underweight (<18.5)	1	1.5%
Normal weight (18.5 - <25.0)	21	31.3%
Overweight (25.0 - <30.0)	17	25.4%
Obesity (30.0+)	28	41.8%
Smoked last trimester of pregnancy		
No	67	88.2%
Yes	9	11.8%
Adequacy of prenatal care		
Adequate and adequate plus	55	76.4%
Inadequate and intermediate	17	23.6%
Principal payer for delivery		
MaineCare/Medicaid	40	54.1%
Other payer	34	46.0%

Maine 2022 Infant deaths	Count*	Percent (%)*
Infant health factors		
Plurality		
Multiple birth	13	17.1%
Singleton birth	63	82.9%
Birthweight		
<1000 g	37	48.7%
1000-1499 g	5	6.6%
1500-2499 g	13	17.1%
2500+ g	21	27.6%
Gestational age at birth		
<32 weeks	41	54.0%
32-33 weeks	4	5.3%
34-36 weeks	11	14.5%
37-38 weeks	6	7.9%
39+ weeks	14	18.4%
Birth location		
Hospital	76	100.0%
Home	0	0.0%
Other	0	0.0%
Geographic Factors		
Urban-rural (2-level) residence at birth		
Urban	28	37.8%
Rural	46	62.2%

Source: Linked Death-Birth certificates, DRVS

***Infant deaths are excluded from counts and percent calculation if stratification characteristic is missing/unknown; counts and percents may not sum to total.**

Table A-3. Maine resident infant deaths, counts and rates per 1,000 live births by select factors, 2018-2022

Maine 2018-2022 infant deaths	Count†	Rate	95% CI
Total	343	5.7	5.15 – 6.39
Demographics of birthing persons			
Age of birthing person			
Under 25	84	7.1	5.68 – 8.82
25-34	181	5.0	4.27 – 5.75
35 and over	72	6.3	4.91 – 7.91
Education of birthing person			
HS diploma/GED or less	160	8.5	7.23 – 9.92
Some college or higher	172	4.2	3.63 – 4.92
Ethnicity of birthing person			
Non-Hispanic	334	5.7	5.14 – 6.38
Hispanic*	4	2.9*	0.79 – 7.44*
Race of birthing person			
American Indian/Alaska Native*	5	11.5*	3.74 – 26.89*
Asian*	4	4.1*	1.11 – 10.44*
Black/African American	25	8.7	5.66 – 12.90
Native Hawaiian or Other Pacific Islander	0	0	0
Other race*	1	3.6*	0.09 – 19.83*
Two or more races*	16	13.3*	7.60 – 21.58*
White	284	5.3	4.70 – 5.95
Birthing person's country of birth			
US state or territory	305	5.6	5.01 – 6.29
Elsewhere	33	6.1	4.20 – 8.56
Birthing person received WIC during pregnancy			
Yes	100	6.8	5.55 – 8.29
No	234	5.2	4.57 – 5.93
Birthing person health status and access-to-care factors			
Pre-pregnancy weight (4-level)			
Underweight (<18.5)*	8	6.9*	2.97 – 13.57*
Normal weight (18.5 - <25.0)	102	4.6	3.73 – 5.55
Overweight (25.0 - <30.0)	80	5.0	4.00 – 6.28
Obesity (30.0+)	123	6.5	5.39 – 7.74
Smoked last trimester			
No	282	5.2	4.62 – 5.86

Maine 2018-2022 infant deaths	Count†	Rate	95% CI
Yes	52	9.4	7.02 – 12.32
Adequacy of prenatal care			
Adequate and adequate plus	251	5.0	4.37 – 5.62
Inadequate and intermediate	71	8.4	6.59 – 10.64
Principal payer for delivery			
MaineCare	170	7.5	6.38 – 8.67
Other payer	164	4.5	3.82 – 5.22
Infant health factors			
Plurality			
Multiple birth	45	21.4	15.63 – 28.67
Singleton birth	293	5.1	4.52 – 5.70
Birthweight			
<1000 g	157	518.2	440.27 – 605.84
1000-1499 g*	18	48.1*	28.52 – 76.06*
1500-2499 g	47	12.3	9.05 – 16.38
2500+ g	106	1.9	1.57 – 2.32
Gestational age at birth			
<32 weeks	183	232.8	200.31 – 269.11
32-33 weeks*	14	23.7*	12.97 – 39.81 *
34-36 weeks	37	9.2	6.45 – 12.62
37-38 weeks	36	2.3	1.61 – 3.18
39+ weeks	67	1.7	1.35 – 2.21
Birth location			
Hospital	328	5.6	5.05 – 6.29
Home*	8	5.9*	2.54 – 11.57*
Other*	2	7.8*	0.95 – 28.33*
Geographic Factors			
Urban-rural (2-level) residence at birth			
Urban	117	5.7	4.73 – 6.86
Rural	211	5.7	4.96 – 6.52
Urban-rural (4-level) residence at birth			
Metro	117	5.7	4.73 – 6.86
Large rural	110	5.2	4.28 – 6.28
Small rural	46	5.9	4.30 – 7.84
Isolated rural	55	6.8	5.13 – 8.86
Birthing person's county of residence			
Androscoggin	36	6.2	4.36 – 8.61
Aroostook	20	6.6	4.01 – 10.14
Cumberland	66	4.7	3.67 – 6.04
Franklin*	12	10.8*	5.57 – 18.83*
Hancock*	10	5.0*	2.38 – 9.11*
Kennebec	34	6.2	4.27 – 8.61

Maine 2018-2022 infant deaths	Count†	Rate	95% CI
Knox*	6	4.2*	1.53 – 9.07*
Lincoln*	9	7.1*	3.23 – 13.39*
Oxford*	13	5.2*	2.78 – 8.94*
Penobscot	39	6.0	4.28 – 8.22
Piscataquis	DSP	DSP	DSP
Sagadahoc*	9	5.9*	2.70 – 11.23*
Somerset*	15	6.6*	3.70 – 10.90*
Waldo*	7	4.1*	1.64 – 8.42*
Washington*	8	5.8*	2.52 – 11.49*
York	48	5.3	3.89 – 6.99

Source: Linked Death-Birth certificates, DRVS
†Infant deaths are excluded from counts if stratification characteristic is missing/unknown; counts may not sum to total
**Interpret with caution; rates calculated with less than 20 individuals in the numerator.
DSP: Data suppressed for privacy.

Appendix B

PANEL MEETING RECOMMENDATIONS

Note: these are recommendations discussed by the panel and are not necessarily supported or endorsed by the Maine Center for Disease Control and Prevention or Department of Health and Human Services. They do not reflect policy commitments, and further do not confer support from the Executive Branch for specific legislative initiatives. Policy proposals will be reviewed and commented on as they arise.

July Meeting Recommendations

- Increase resources for the Panel members to understand the influence of social determinants of health (SDOH) on perinatal mortality and cultural and lived-experience perspectives by:
    - Recruit a more diverse slate of Panel members.
    - Conduct family interviews.
    - Obtain and review social service and other non-medical records.
    - Include the Plan of Safe Care in the medical record.
- Pediatrician appointments should be made before baby hospital discharge.
- Safe Sleep education should be delivered multiple times in multiple settings.
- Emphasize "second sleep" safe sleep education including acknowledgment that this time of day is the hardest to comply with safe sleep practices.
- Referrals for all social service needs should be made and in place prenatally.
- Even with experienced mothers, all should have prenatal care.
- Normalize postpartum in-home care.
- Increase community CPR instruction.
- Provide prenatal and hospital CPR instruction (videos)
- Provide support and strategies for parents with multiple young children.
- Expand postpartum doula support.
- Provide prenatal home visits for comprehensive assessment of family assets and needs.
- Institute patient navigators prenatally
- If on MaineCare, institute opioid home health care as case manager
- Education for families and mothers on maternal exhaustion
- Better internet access to resources for family in perinatal period
- Need for paid parental leave.
- Improve local culturally appropriate support.
- Increase support for families whose newborns have prolonged hospital stays.

October Meeting Recommendations

- Increase education regarding uterine rupture.
- Local communication and chain of command changes
- Collect data on birth outcomes of NICU team presence vs. absence at outlying hospitals.
- Add a mental health provider to the Panel.
- Trauma informed care education for care providers
- More promotion of family planning services

January Meeting Recommendations

- Additional training, including simulation, on management of obstetric (OB) calls and emergencies for EMS personnel and greater collaboration between community midwives and transport teams.
- Educate (following WIC model) families on the importance of pregnancy spacing especially after loss.
- Support MCH Perinatal Outreach Coordinator and team on implementation of a safety bundle managing severe hypertension in pregnancy and postpartum period.
- Expand outreach education to reinforce the importance of aspirin for patients at risk for hypertension and counsel on increased risk of cardiovascular disease later in life for women who experienced hypertensive disorders of pregnancy.
- Establish system of surveillance to ensure all pregnant people are screened for domestic violence at least once during pregnancy using a validated screening tool.

May Meeting Recommendations

- PQC4ME, MHTF, or designee, to explore existing resources for providers and patients with COVID-19 vaccination information for people of childbearing age by the end of 2023.
- Inpatient provider team to transfer to higher level of care for patients in need of specialized equipment and clinical care not available in lower level of care facility during inpatient admission.
- Support Perinatal Outreach work to ensure hospitals have guidelines for pregnant patients who present to the ED at 22 weeks gestation or greater that includes maternal stabilization followed by obstetric medical screening exam and fetal assessment.
- Educate care providers on referral to care coordination and/or specialized patient advocacy for pregnant people with a substance use disorder (SUD), including Cradle ME referral.
- Work with inpatient pharmacies to offer expedited medication access for emergent cases with Prior Authorization waiver.
- Add a MaineCare representative to the Panel by October 2023
- Expand DHHS OCFS and Office of Behavioral Health (OBH) collaboration policy regarding access to Opioid Treatment Programs (OTP) records to all agencies within DHHS to better support, treat, and serve families.
- Work with Maine Medical Center to share protocols on SUD Pregnancy Risk Factors, including when to suggest a urinalysis and use of standardized verbal screen for substance use like the 4Ps[9].
- Establish a peer support system in Maine hospitals for at-risk patients like State-level contracts with EDs for peer support programs.
- Continue support for the ME MoM[10] program.

[9] Parents, Partner, Past, and Present (4Ps') is a universal drug screening a tool used to identify risk factors for substance abuse. This screening tool has been validated in non-pregnant subjects but not in pregnancy.

[10] MaineMOM improves care for pregnant and postpartum people with opioid use disorder and their infants by integrating maternal and substance use treatment services. https://www.maine.gov/dhhs/oms/about-us/projects-initiatives/mainemom

- Educate family members on Safe Sleep[11] (including need for smoke-free environment)
- Create Plan of Safe Care prenatally for all families to identify family strengths and needs, beneficial resources and actions to best support substance exposed infants and families
- Establish a doula support payment system for at-risk groups.

[11] National Institute of Health - Safe to Sleep https://safetosleep.nichd.nih.gov/

Appendix C

RELATED MFIMR ACTIVITIES

Memorandum of Agreement for Records Release between DHHS MFIMR Panel and the Office of the Chief Medical Examiner

To promote the health of fetuses, infants, and pregnant or postpartum women, DHHS and the OCME agreed to minimize or eliminate duplication of efforts and to collaborate and coordinate activities related to the work of the MFIMR Panel. An MOU was established that allowed for the sharing of autopsy, police and associated investigative reports and interviews between the Panel coordinators and OCME.

Information Request Process Established for WIC and PHN

During SFY 23, the Panel Coordinator worked with the Maternal Child Health Director and the MFIMR Steering Committee to create a form requesting information from the heads of the WIC program and the Cradle ME/PHN program about the cases being considered for summarizing. Both WIC and Cradle ME/PHN are housed within ME CDC and no formal agreement needed to be made. If either program had contact with the family involved in a fetal, infant, or maternal death, the form asks for information on stable housing, phone service, transportation issues, income level, immigrant status, counseling/education referrals, health care payer, presence of disability or chronic illness, general literacy issues, support systems, education provided, and presence of other social drivers of health. The form was piloted for the cases reviewed at the July meeting and utilized successfully for the October, January, and May meetings.

Community Vital Signs

A project was funded by the US CDC and DHHS Office of Minority Health to support Maternal Mortality Review Committees in their evaluation of the social determinants of health to understand and ultimately eliminate racial, economic, and geographic disparities. The project created a dashboard for providing visual summaries of data indicators of the "community vital signs" of the place in which a decedent lived, worked, and played, using the decedent's address. The indicators on the CVS dashboard include the perinatal health service environment (e.g., # of PCPs per 100,000 people), reproductive health service environment (e.g., # of OB-GYNS per 100,000 people), behavioral health service environment (e.g., drug overdose death rate), transportation environment (e.g., households without a car), and socioeconomic environment (e.g., poverty and violent crime rate). These indicators, along with informant interviews, provide the social context for a case to be reviewed. The Maine MFIMR coordinators began to utilize the dashboard in their maternal, fetal, and infant death case narratives this year.

Information Request Process Established with OCFS

During SFY 23, the Panel Coordinator worked with the Maternal Child Health Director, the MFIMR Steering Committee and representatives from the Office of Child and Family Services to create a form requesting information about the cases being considered for summarizing. An interoffice collaboration agreement was established whereby information would be provided by the OCFS Child Death and Serious Injury Review (CDSIR) Panel Coordinator to the MFIMR Panel Coordinator. If a report was made to OCFS about the family involved in a fetal, infant, or maternal death, the form asks for information on the reason for the report, actions taken after the report, the final determination on the report (screened out, assigned – no findings, or assigned –

substantiated), any social or emotional stressors identified (e.g., homelessness, substance use, intimate partner violence), and whether the case was reviewed by the CDSIR Panel or the Child Welfare Advisory Panel. Also collected is information about stable housing, phone service, transportation issues, income level, immigrant status, counseling/education referrals, health care payer, presence of disability or chronic illness, general literacy issues, support systems, education provided, and presence of other social drivers of health. The form was piloted over the spring of 2023, and ready to be utilized in SFY 2024.

Critical Income Loss Stipend for Panel Members with Lived Experience

MFIMR members who are participating in this group as members of the community bringing in their lived experience and are not participating representing their professional role or expertise, are eligible for a community participation, critical income loss stipend based on PQC4ME-established standard. The stipend is available for participation in MFIMR meetings and retreat meetings. Upon joining MFIMR, members are informed of stipends and must request critical income loss stipend by email to the Project Manager.