Oregon Maternal Mortality and Morbity Review Committee

Biennial Report

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Oregon Health Authority
PUBLIC HEALTH DIVISION
Maternal and Child Health

Contributors

The Governor-appointed Maternal Mortality and Morbidity Review Committee

The multiple facilities and agencies that contributed to operation of the Oregon Maternal Mortality and Morbidity Review Committee

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The OHA Maternal and Child Health Section also thanks Suzanne Zane and the Centers for Disease Control and Prevention's Division of Reproductive Health Maternal and Child Health Epidemiology (MCHEP) program and the Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) program.

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Executive summary

Deaths that occur during pregnancy, labor and delivery, and the following year are tragic outcomes for those affected and for their families and communities. The number of maternal deaths nationally has increased from approximately 700 per year in 2018 to over 850 maternal deaths in 2020.[1] Maternal Mortality Review Committees exist at the state and local levels to increase capacity for response to these tragic events. They examine deaths with a temporal relationship to pregnancy, identify causes and risk factors associated with the deaths and create recommendations to prevent these from occurring in the future. The Centers for Disease Control and Prevention (CDC) provides nationwide support to MMRCs through the Enhancing Review and Surveillance to Eliminate Maternal Mortality (ERASE MM) Program.

Pregnancy-related

A death during pregnancy or within one year of the end 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.

The Oregon Maternal Mortality and Morbidity Review Committee (MMRC) consists of a methodical review process used by a multidisciplinary board that reviews the lives and deaths of people who died during and the year following pregnancy. When reviewing a case, the committee examines the cause of death, whether the death was preventable, and what factors contributed to the outcome. Medical conditions and the social determinants surrounding each case are equally important conversations when reviewing these factors, as the goal of review is to promote positive changes among health care systems, communities, and individuals. After reviewing its findings, the committee recommends interventions to reduce future deaths and improve systems of care for pregnant and postpartum* people and families in Oregon. The Oregon MMRC was established in 2018 within the Oregon Health Authority (OHA) Public Health Division and is staffed by the Maternal and Child Health Section.

Pregnancy-associated, but not related

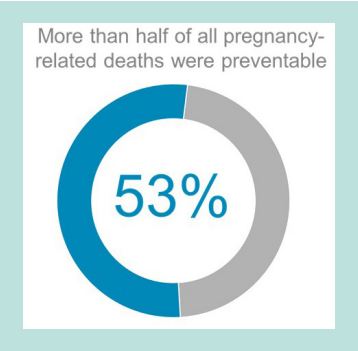
A death during pregnancy or within one year of the end of pregnancy from a cause that is not related to pregnancy.

1. Hoyert DL. Maternal mortality rates in the United States, 2020. NCHS Health E-Stats. 2022. https://www.cdc.gov/nchs/data/hestat/maternal-mortality/2020/maternal-mortality-rates-2020.htm#print

* This report utilizes the term "postpartum" to indicate the time period following the end of pregnancy, regardless of the duration or site of the pregnancy or of the pregnancy outcome.

The committee has been reviewing cases since August 2020; as of January 2023, **the committee has reviewed 37 deaths** that occurred between 2018 and 2020. This report summarizes the findings and recommendations from those reviews. The cases included in this report include all maternal deaths identified for review from 2018 and 2019 and 61% of the deaths identified for review from 2020.

Of all these, the deaths of **17 pregnant or postpartum people**, or **46%** of the cases reviewed, **were determined by the committee to be pregnancy-related.**



Among these pregnancy-related deaths, the deaths of nine people, or 53%, were considered by the committee to be preventable. It is of note that, of pregnancy-related deaths, nearly half of underlying causes of death were due to mental health issues and/or substance use disorders.

After reviewing the underlying cause of death, contributing factors, preventability, and any other circumstances that were present at the time of death, the committee decides on recommendations that may avert future deaths from occurring and ultimately improve systems of care. The top five preventive recommendations identified through review of all pregnancy-associated deaths include:

1. Ensure culturally specific coordination of care and support before, during, and after pregnancy.
2. Expand utilization of doulas in health care systems.
3. Ensure pregnant and postpartum people with mental health conditions obtain the services they need to manage their condition.
4. Ensure pregnant and postpartum people with histories of substance use disorders obtain the services they need to manage their condition.
5. Strongly consider an autopsy after the death of a pregnant or postpartum person.

Oregon's MMRC is also exploring occurrence of severe maternal morbidity in the state. Severe maternal morbidities are very serious health conditions that, even with timely intervention, have detrimental impacts and could have resulted in a maternal death. Cases of severe maternal morbidity during Oregon delivery hospitalizations ranged between 0.6% and 1.1% during 2019–2021.

This report is located online on the Maternal and Child Health Section page of the OHA website. It can be accessed and downloaded at: www.healthoregon.org/mmrc.

Introduction

Pregnancy-related mortality has increased steadily in the United States since the 1980s.[2] A CDC study that included data from maternal mortality review committees in 36 U.S. states from 2017 to 2019 reported approximately 80% of deaths with pregnancy related causes were preventable.[3] The same report documented that most deaths occurred during the year postpartum. Additionally, gaps in death rates exist between racial and ethnic groups. Pregnancy-related deaths for non-Hispanic American Indian/Alaskan Native and non-Hispanic Black people are disproportionately higher compared to non-Hispanic White people.[4] Maternal mortality is a tragic national burden that takes an even greater toll on communities of color.

MMRCs at the state and local levels address deaths that take place during pregnancy, labor and delivery, and up to a year postpartum through ongoing case reviews. These multidisciplinary committees are positioned to examine the causes of deaths during and after pregnancy and can use their findings to create recommendations for prevention tailored to their state's individual needs.

Oregon's MMRC is also exploring occurrence of severe maternal morbidity in the state. Severe maternal morbidities are very serious health conditions that, even with timely intervention, have detrimental impacts and could have resulted in a maternal death. Understanding of the scope of severe maternal morbidities, which occur at least ten times more often than maternal deaths, can assist in making recommendations for prevention of both severe maternal morbidity and maternal deaths.

In 2016 OHA began matching reproductive-age female-identified decedents to certificates of live birth, of fetal deaths, and of infant deaths that occurred on or within 365 days of the pregnant or postpartum person's date of death. The use of this matching revealed an increased number of potentially pregnancy-associated deaths (e.g., the death of a person while pregnant or within one year of pregnancy, regardless of the cause) as compared to reviewing death certificates of reproductive-age people alone. Although these data were helpful in determining basic information about the

2. Centers for Disease Control and Prevention. Pregnancy Mortality Surveillance System. Retrieved December 23, 2020 https://cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm
3. Trost SL, Beauregard J, Njie F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017-2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.
4. Peterson, E.E., Davis, N.L., Goodman, D., et al. (2019). Racial/Ethnic Disparities in Pregnancy-Related Deaths-United States, 2007–2016. MMWR, 68(35), 762-65. https://www.cdc.gov/mmwr/volumes/68/wr/mm6835a3.htm

causes of death during pregnancy and the postpartum period, they did not provide any background about life events that led up to and surrounded each death and whether the outcome may have been preventable.

The Oregon MMRC was established within the OHA through House Bill 4133 during the 2018 Oregon legislative session. Fifteen multidisciplinary committee members were appointed by the Governor's Office the following year. During case review meetings members of the Oregon MMRC determine whether each death was directly related to pregnancy, discuss factors leading to and surrounding each death, and decide whether the outcome was preventable. Based on each case that is reviewed, they discuss recommendations that can be made to prevent future maternal deaths.

Three to five review meetings were held each year from 2020 through 2022 for a total of twelve case review meetings, and more than one death was discussed during each meeting. The deaths occurred in the years 2018 to 2020 and the recommendations and findings presented in this report are aggregated from these years.

Specific authorities, protections and processes are in place that allow the Oregon MMRC to convene and conduct case reviews:

Legislative Statute

In 2018 the Oregon Legislature established the MMRC (ORS 432.600) within the OHA. Information about House Bill 4133, Chapter 63, 2018 Oregon Laws can be accessed at: https://olis.oregonlegislature.gov/liz/2018R1/Measures/Overview/HB4133.

Access to Records

Records are used to create deidentified summaries about the cases that are reviewed by the committee. The case narrative content is collected from multiple sources (e.g., birth and death certificates, medical records, autopsy and law enforcement reports), and "any other data or information the committee may deem relevant in connection with maternal mortality and severe maternal morbidity."[5] The process of obtaining appropriate records and abstracting relevant information is summarized later in this section.

Defined Membership

The Oregon MMRC consists of a multidisciplinary panel of fifteen Governor-appointed members. They possess expertise in clinical and community-based maternal health promotion and represent various specialties and systems throughout the state.

5. Oregon Laws, Oregon Administrative Rules, ORS 432.600 Establishment of committee https://oregon.public.law/statutes/ors_432.600

During case reviews, committee members determine if deaths were directly related to pregnancy, identify factors that contributed to each death, and recommend interventions that could decrease and eliminate future maternal deaths. Appendix A contains a roster of the MMRC members appointed in 2019 that discussed the cases and provided the recommendations included within this report.

Confidentiality

Data and information obtained specifically for MMRC activities are considered confidential. Records that are used to create case narratives are protected from disclosure to any parties not associated with the MMRC. OHA Maternal and Child Health MMRC staff redact all personal identifiers from the case narratives prior to sending to committee members for review.

The goals of the MMRC are to:

- **Perform thorough record abstraction** to obtain details of events and issues leading up to a pregnant or postpartum person's death
- **Perform a multidisciplinary review of cases** to gain a holistic understanding of the issues
- **Determine the annual number of maternal deaths related to pregnancy** (pregnancy-related mortality)
- **Identify trends and risk factors** among pregnancy-related deaths in Oregon
- **Recommend improvements to care** at the individual, provider, and system levels with the potential for reducing or preventing future events
- **Prioritize findings and recommendations** to guide the development of effective preventive measures
- **Recommend actionable strategies for prevention** and intervention
- **Disseminate the findings and recommendations** to a broad array of individuals and organizations
- **Promote the translation of findings and recommendations** into quality improvement actions at all levels

MMRC Case Review Process

Maternal mortality review includes a set of state agency staff as well as the appointed committee, with each group enacting specific procedures. The case review process is an ongoing activity with steps that are followed from case identification to committee findings and recommendations to information sharing. The committee members are essential to the process as they examine each case to learn more about the causes of maternal mortality in Oregon and recommend interventions to prevent future deaths during and after pregnancy.

Case Ascertainment

Case ascertainment for all potentially pregnancy-associated deaths is done through analysis of vital records data using CDC recommended criteria. Cases for committee review are initially obtained from Oregon death certificates of reproductive-aged female-identified decedents using any of the following methods:

- One of the applicable pregnancy checkbox options on the death certificate is selected. (decedent was: pregnant at time of death; pregnant within 42 days before death; or pregnant within 43 days to one year before death)
- An "obstetric" code is used in any cause of death field on the certificate. (The National Center for Health Statistics assigns ICD-10 codes to all causes of deaths reported in the United States)
- The death certificates are linked with certificates of live births, fetal deaths, and infant deaths occurring on or within 365 days prior to the person's date of death
- A literal search for pregnancy-related keywords (e.g., "pregnancy", "postpartum") is performed on the death certificates

For the years 2018 – 2020, there were 55 deaths identified for further investigation. Eight of these cases were determined to be false positives or out of scope of committee review. The committee has reviewed 37 of the remaining 47 cases as of January 2023. As 11 deaths from 2020 have not yet been reviewed, and because the number of deaths determined to be pregnancy-related each year in 2018 and 2019 are small, we cannot provide reliable annual pregnancy-related mortality ratios for the years included in this report.

Investigation and Case Abstraction

The investigation phase begins as the vital records information from each case is reviewed for essential facts such as cause of death, location of death, and significant dates to determine where to seek further information for each case. ORS 432.600(12)(a) through (13) ensures information that is requested for the purpose of accurately presenting cases to the MMRC is made available by the agencies that possess this material.

Information is requested from all known entities that encountered the decedent in the time leading up to and including the death. These include but are not limited to:

1. Hospital records
    - Inpatient care
    - Emergency department visits
2. Clinic records
    - Prenatal care provider
    - Primary care provider
    - Behavioral health/mental health provider
3. First responder records
4. Law enforcement records
5. Social service records including child welfare reports
6. Medical examiner or coroner records

The MMRC medical records abstractor reviews records once they are received and creates a case narrative about each decedent that will be discussed by the committee. It is common for records to reference additional agencies, which we then contact for further information about the case. There are occasions when an individual may have died as the result of an injury, and one may ask why records are being requested in relation to maternal mortality in this instance. The members of the MMRC examine the significant life events that led to each death, as well as the clinical factors involved. Although it may initially appear that the death may not have been pregnancy-related, the committee will make this determination after reviewing the case narratives created by the abstractor. Indeed, there have been instances when an injury resulted in death and through the records that were received and abstracted to create the case narrative, the members were able to determine the death was pregnancy-related (e.g., suicide).

The CDC provides a national database, known as the Maternal Mortality Review Information Application (MMRIA) to assist MMRCs with standardized data collection. MMRIA provides a common data language that is recognized nationally by other state and local MMRCs. This system assists the medical record abstractor

with data organization and narrative creation that is free of any personal identifiers. In Oregon, the narratives describing each case are securely emailed to committee members ahead of review meetings so members can analyze each case before the committee convenes to discuss them.

Case Review Meetings

Committee members review deaths that occurred during pregnancy, during labor and delivery, or in the year following the end of pregnancy. Review meetings are convened in closed, non-public settings, allowing the committee to confidentially discuss the decedent's life and death and the elements they feel contributed to each outcome. The medical history is examined, as well as non-clinical components, including the decedent's family environment, socioeconomic conditions, and the physical environment they lived in. The committee determines whether mental health conditions and/or behavioral health disorders existed prior to and near the time of death and whether any services and care coordination were received. The committee also determines, where possible, whether the individual experienced any forms of discrimination in their life. Differential treatment is not necessarily documented within the records, and the abstractor takes special care to include within the case narratives any references to subtle actions that may indicate the presence of discrimination, racism, and social inequities.

These additional details assist the committee in becoming more familiar with the individual they are discussing and demonstrates the importance of obtaining records providing an account about the decedent's life. The members require comprehensive case narratives to determine whether a death was directly related to pregnancy, to identify the risk factors for each individual they review, and to recommend measures to help prevent future deaths related to pregnancy.

Self-Care

Vicarious trauma has been defined as "experiencing or feeling something by hearing the details of someone else's trauma, as opposed to experiencing it firsthand". [6] During each review meeting, discussions take place about deaths that have pregnancy in their context. This can be difficult for all attendees, and everyone approaches this experience in their own way. To help decrease vicarious traumatization after engaging in conversations about these deaths, each meeting ends with a "check-in" to encourage everyone to share what they will do after the meeting or in the near future to provide care for themselves physically and emotionally.

6. Guidance for CDR and FIMR Teams on Addressing Vicarious Trauma. December 2016. National Center for Fatality Review and Prevention. Retrieved January 3, 2023. https://www.ncfrp.org/wp-content/uploads/NCRPCD-Docs/GuidanceVicariousTrauma.pdf

Guiding questions for MMRC case review:

The following questions guide the Oregon MMRC when reviewing case narratives:[7]

Was the death pregnancy related?

- Pregnancy-related death is defined as a death that occurred during pregnancy or within one year of the end of pregnancy due to a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.

What was the underlying cause of death?

- The disease, condition or injury that initiated the chain of events leading to death, or the circumstances of the accident or violence that produced the fatal injury.

Was the death preventable?

- A death is considered preventable if there was at least some chance of the death being averted by one or more reasonable changes to the systems that surrounded the decedent, the community they lived in, the facilities and providers they sought care from, and/or their personal and family life.

What other circumstances surrounded the death?

- The committee determines if any of the following contributed to each death:
  - Obesity
  - Discrimination
  - Mental health conditions
  - Substance use disorder

What factors contributed to the death?

- The committee discusses the factors that contributed to each death on the following levels:
  - The systems in the decedent's life before, during, and after pregnancy (e.g., payer sources and health care systems)
  - The decedent's community, including physical location and areas of common interests and circumstances
  - The facilities and providers involved in the decedent's care, and
  - The individual and their family before, during or after pregnancy

What recommendations does the committee have to prevent future deaths like this one?

- After reviewing the underlying cause of death, the contributing factors, preventability, and any other circumstances that were present at the time of death, the committee decides on recommendations that may avert future deaths and ultimately improve systems of care.

7. Review to Action. Committee Decisions Form v.22. Retrieved January 13, 2023, from: https://reviewtoaction.org/national-resource/mmria-committee-decisions-form-and-additional-guidance-updated-form-added

MMRC Outputs: Sharing Information and Implementing Recommendations

The vision of the Oregon MMRC is to eliminate preventable maternal mortality and morbidity by reviewing pregnancy-related deaths, identifying contributing risk factors, and creating recommendations to reduce future deaths.

Committee members discuss and make decisions during confidential case review meetings. The next step in the MMRC process involves sharing these findings with others. Waiting for results to be collected and analyzed can be challenging; however, it is important to have an adequate number of cases reviewed to perform data analysis. Analytic findings can shine light on the elements involved in maternal mortality in Oregon. By sharing the risk factors for maternal deaths and preventive recommendations as determined by the committee with legislators, health care facilities, relevant state agencies and community organizations, the hope is that implementation of the recommendations can begin.

Similar to having a multidisciplinary board such as the MMRC that reviews cases and creates recommendations, engaging diverse partners that possess expertise in their fields is important to identify on-the-ground strategies and possible challenges to implementation of recommendations. The CDC resource "State Strategies for Preventing Pregnancy-Related Deaths: A Guide for Moving Maternal Mortality Review Committee Data to Action" provides guidance on putting priority recommendations created by MMRCs into motion and is meant to be tailored for use by individual states. This guidance includes the following steps summarizing the approaches for implementing actionable recommendations. It is important to incorporate an equity lens within each of the following steps when translating MMRC data into preventive action:[8]

1. Use data to understand the scope of the problem
    - Align the specific recommendation with other available population-level data (e.g., the Pregnancy Risk Assessment Monitoring System (PRAMS), hospital discharge data)
2. Understand the context of the solution
    - Engage public health, clinical facilities, and community partners, including each organization's decision makers, to assist with identifying strengths and barriers for implementing the recommendation

8 Review to Action. State Strategies for Preventing Pregnancy-Related Deaths: A Guide for Moving Maternal Mortality Review Committee Data to Action. Retrieved January 3, 2023 from https://reviewtoaction.org/national-resource/state-strategies-preventing-pregnancy-related-deaths-guide-moving-maternal

3. Identify potential goals and strategies
    - This step also includes ensuring the "who should do what and when" of each recommendation is in place
4. Act on the strategies
    - Ensure the strategies that are decided on are appropriate and acceptable to the needs of the population involved, and are feasible and cost effective

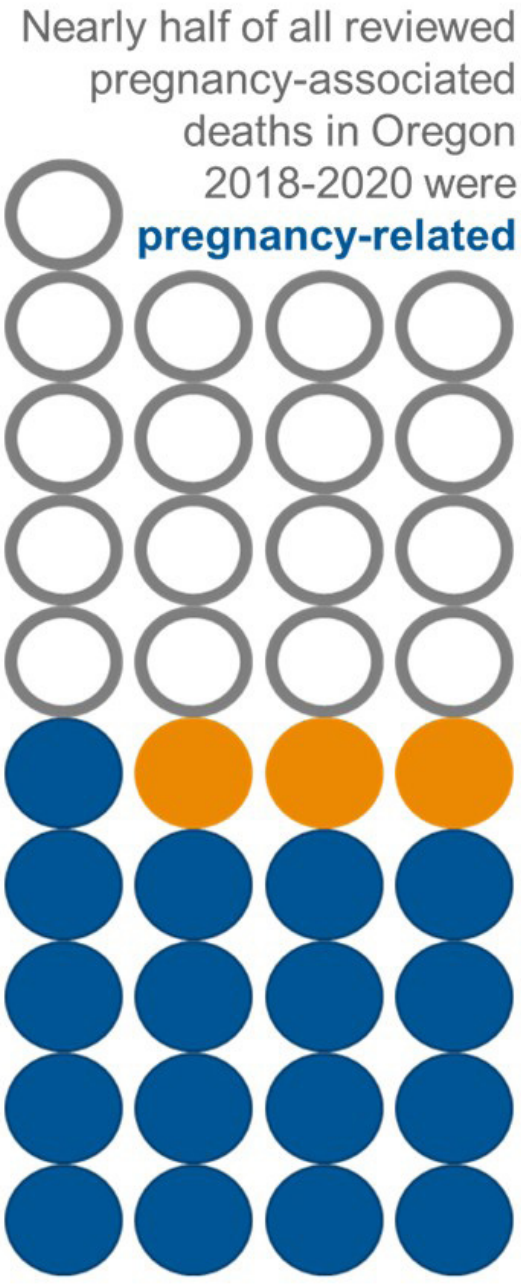
The guidance referenced above will provide a foundation as the Oregon MMRC recommendations are implemented. The remainder of this report will present findings and recommendations made by the committee since it began reviewing cases in August 2020.

Committee Findings

Pregnancy Relatedness

One of the most vital determinations made by the committee is on the question of whether a death was related to pregnancy. According to CDC guidance that informs all MMRCs around the United States, a death is decided to be pregnancy related if the death is "from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy."[9] Of the 37 deaths reviewed, 17 (46%) were determined by the committee to be pregnancy related. The committee determined that had these 17 people had not been pregnant, they would not have died.

The committee was unable to determine the degree of relatedness for three reviewed deaths. The final 17 reviewed deaths were determined to be pregnancy associated, but not related — meaning the circumstances or causes of those deaths were not related to or exacerbated by pregnancy. Unless otherwise stated, the findings in this report are based on the 17 deaths that were determined to have been pregnancy related.

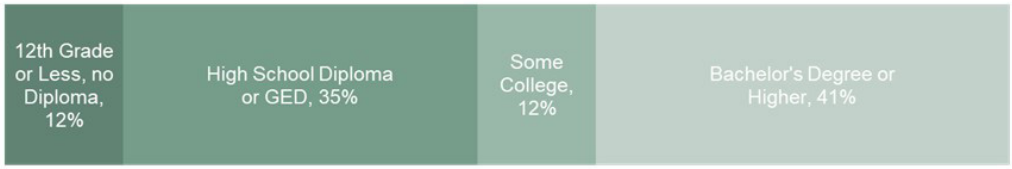


9. https://www.reviewtoaction.org/learn/definitions

Demographics of Pregnancy-Related Deaths

Among all deaths determined by the committee to be pregnancy related, the person's age at the time of death ranged from 20 to 42 years, with a mean of 31 years. There was a wide range of educational experience among people who died of pregnancy-related causes. Two people had a documented history of homelessness either during the pregnancy or within one year prior to the pregnancy. Pregnancy-related deaths were identified in all areas of the state: 14 cases (82%) had a last known residence in a metropolitan county of Oregon (counties with more than 250,000 residents), while three cases (18%) resided in either a micropolitan or a rural county.

Educational experience for pregnancy-related deaths
Includes reviewed deaths from 2018-2020, n=17



Case materials for each of the 17 decedents had self-reported documentation of race and ethnicity available; the distribution of race and ethnicity is shown in the table below.

Percentage of pregnancy-related deaths by race/ethnicity
Includes reviewed deaths from 2018-2020, n=17

American Indian/Alaska Native	6%
Asian	18%
Hispanic	6%
White	71%

Timing of Pregnancy-Associated and Pregnancy-Related Deaths

Pregnancy-associated deaths are defined as all deaths that occur during or within one year of pregnancy, regardless of cause. Generally, timing of pregnancy-associated deaths can be broken into three categories based on how long after pregnancy the death occurred:

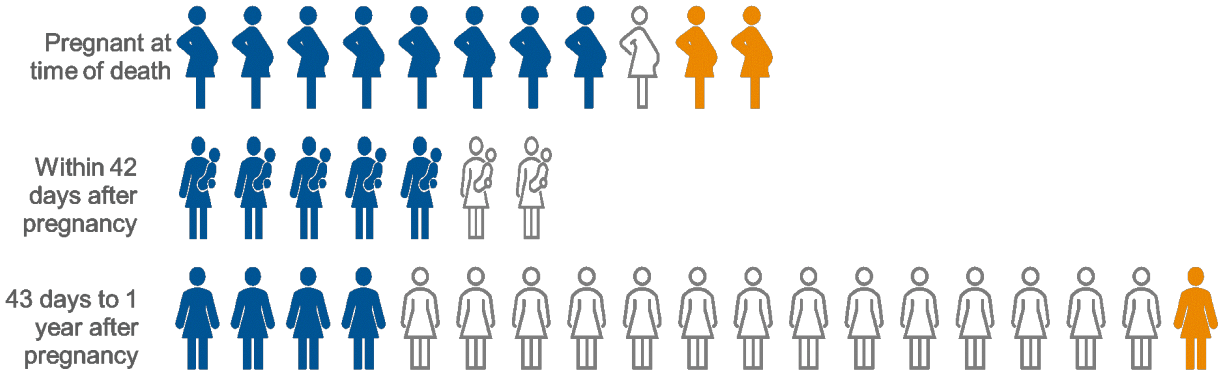
1. Pregnant at time of death
2. Pregnant within 42 days of death (early postpartum period)
3. Pregnant 43 days to 1 year before death (late postpartum period)

Of all deaths reviewed, 11 (30%) were pregnant at time of death, 7 (19%) deaths occurred within 42 days of the end of pregnancy, and 19 deaths (51%) occurred in the later postpartum period between 43 days to one year after the end of pregnancy as shown below. The majority of all cases reviewed by the committee occurred in the late

postpartum period. However, three quarters of the pregnancy-related deaths happened either during pregnancy or during the early postpartum period. Among pregnancy-related deaths, 8 (47%) people were pregnant at time of death, 5 (29%) deaths were within 42 days of the end of pregnancy and 4 (24%) deaths were more than 43 days after the end of pregnancy.

Timing of reviewed pregnancy-related, not pregnancy-related* and undetermined deaths among all pregnancy-associated deaths

Includes reviewed deaths from 2018-2020, n=37



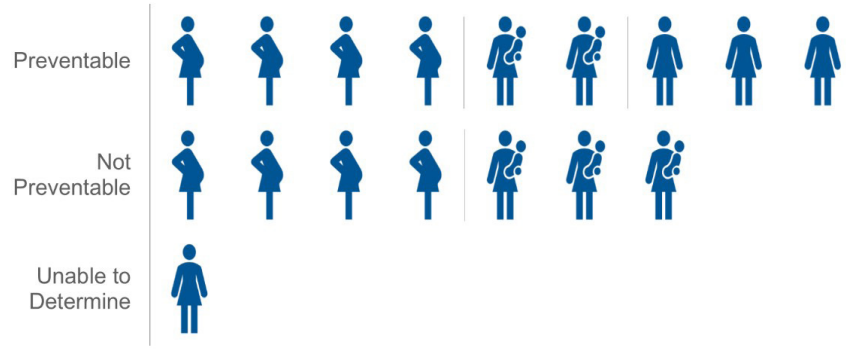
*Not pregnancy related means the death occurred within one year of the end of pregnancy but no causal relationship was found between pregnancy and the death

Preventability

A death is considered preventable if there was at least some chance of the death being averted by one or more reasonable changes to the systems that surrounded the decedent, the community they lived in, the facilities and providers they sought care from, or their personal and family life. The committee determined that over half (53%) of reviewed cases were preventable deaths. When examined by timing of the death in relation to pregnancy, more than half of pregnancy-related deaths occurring during pregnancy were deemed preventable and nearly all deaths in the late postpartum period were either preventable or the committee was not able make a determination of preventability.

Preventability among pregnancy-related deaths

Includes reviewed deaths from 2018-2020, n=17

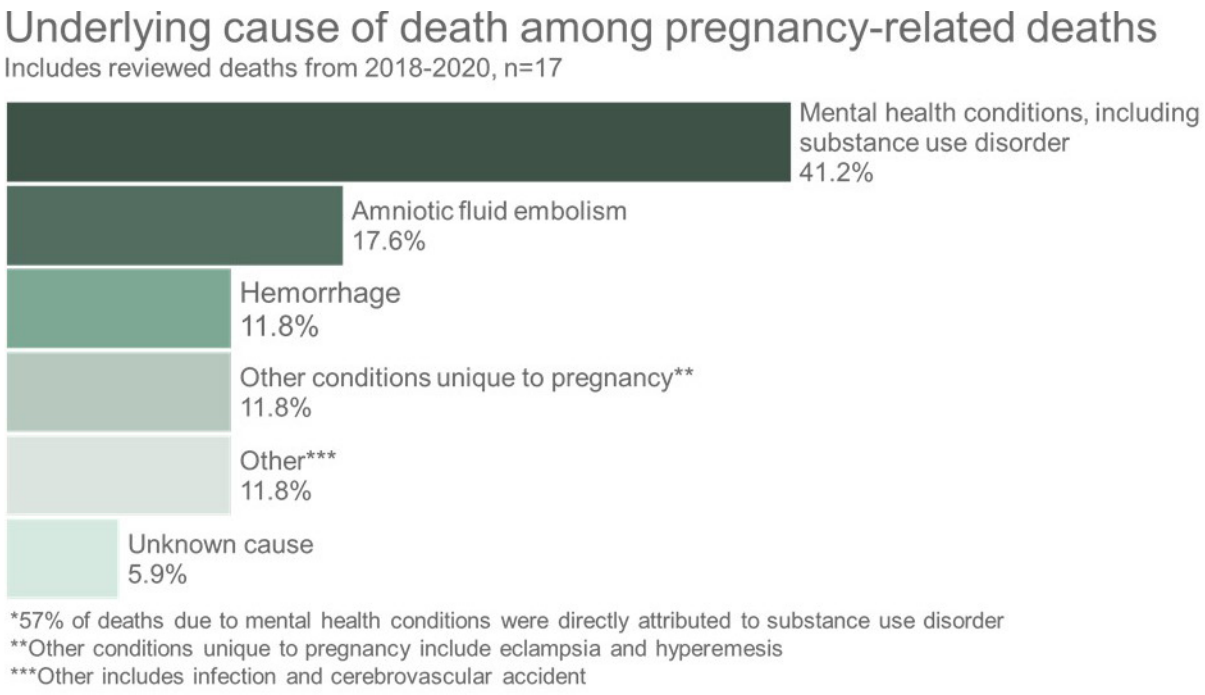


Cause of Death

Along with determining whether the death was directly related to pregnancy, the committee is tasked with determining an underlying cause of death for each case. The underlying cause of death is defined as the disease, condition, or injury that initiated the chain of events leading to death, or the circumstances of the accident or violence that produced the fatal injury. After reviewing each decedent's case narrative, the committee decides on an underlying cause of death. Their decision may or may not match the cause of death listed on the death certificate. It is of note that only nine (53%) of the pregnancy-related deaths had autopsy reports.

The most frequent category for underlying cause of death was mental health conditions including substance use disorder, accounting for seven pregnancy-related deaths (41%). Four of these deaths had an underlying cause of substance use disorder. Mental health conditions including substance use disorder was the most frequent cause of death not only among pregnancy-related deaths but also among the larger group of all reviewed deaths.

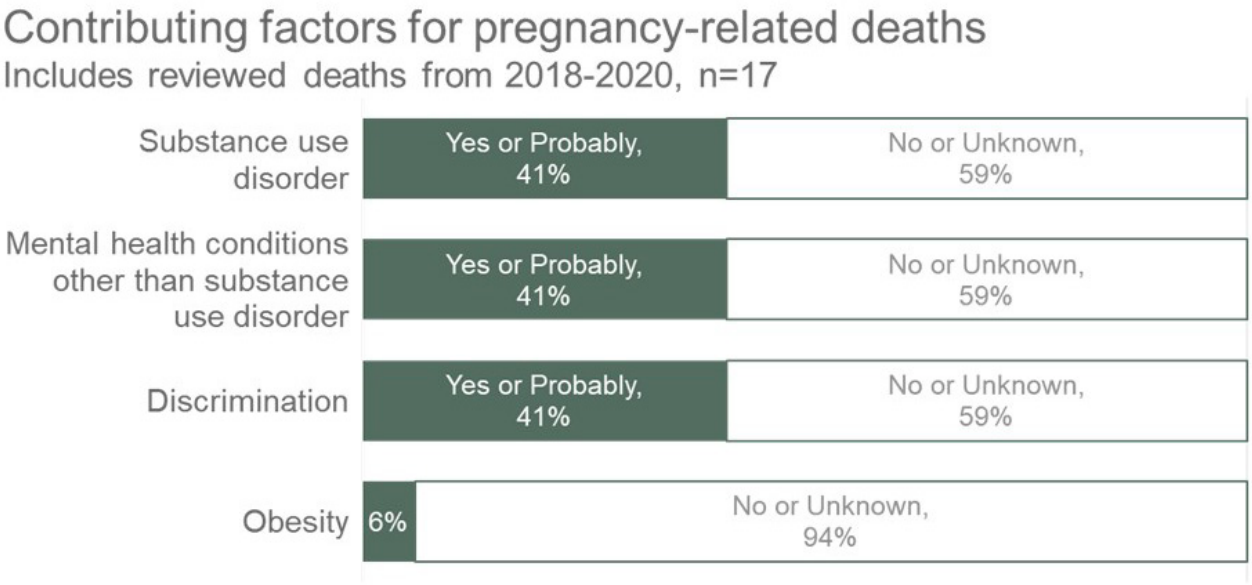
Amniotic fluid embolism, the second leading cause of death (n=3), is generally not considered to be a preventable condition; however, survivability is dramatically improved when occurring in a tertiary care center where high-level critical care capabilities can be rapidly accessed.



Circumstances Surrounding Death

Three pregnancy-related deaths (18%) were classified as suicides by the committee. None of the pregnancy-related deaths were homicides.

For each case, the committee decides whether of one or more of four specific factors was present that may have contributed to the pathway leading to death. It is of note that the discrimination factor encompasses a variety of biases and prejudices that the decedent may have encountered in their life and in their medical and social experiences. Examples include, but are not limited to, the decedent having experienced discrimination based on the language they speak, perceived race or ethnicity, poverty, substance use, mental health status, or weight.



Committee Recommendations

Listed below are the five most frequent recommendations given by the committee based on all reviewed deaths. For each of these, the committee provided descriptions of multiple needs and strategies that would support the recommendation. Strategies to address these recommendations can be implemented at various levels, such as systems, hospitals and providers, and community.

Ensure culturally specific coordination of care and support before, during, and after pregnancy.

The recommendation of care coordination in this report includes the multiple individuals that are involved with clinical and non-clinical aspects of care and support for prenatal, pregnant, and postpartum people.

Systems:

- Extend funding to statewide Medicaid programs supporting pregnant people to invest in additional social workers and behavioral health specialists that will assist the transition to the postpartum period.
- Ensure coordinated care organizations (CCOs) are utilizing traditional health workers and peer support specialists to help patients navigate the health care system and obtain necessary services during and after pregnancy. CCOs should engage care coordinators to ensure assistance with the transition from obstetric care to routine primary care providers, reproductive services, and if needed, other specialists.

Hospitals and Providers:

- Understand and practice cultural sensitivity in all aspects of patient communication and care, including culturally specific care for pregnant and postpartum people.
- Ensure follow-through between providers and other specialists when coordinating care and services. Care coordination is especially important for people who leave hospitals without their infant, no matter what circumstances led to this outcome.
- Create partnerships between providers who care for pregnant patients and home visitors in the community who can meet with clients in their homes, assist with outreach services, and provide education to clients and their families.

Community:

- Encourage state-sponsored community-based support groups to offer social connections to pregnant and postpartum populations. Provide community outreach with needs such as housing, childcare and cell phone services.
- Allocate state and county funding to assist with accessing birthing and peer support specialist trainings to organizations supporting Black, Indigenous and People of Color (BIPOC) communities.

Expand utilization of doulas in health care systems.

Doulas provide culturally specific physical and emotional support during and after pregnancy, including labor and delivery. Their training includes childbirth, pre- and postnatal care, and cultural competencies.

Systems:

- Encourage health care systems, including CCOs, to employ doulas to provide culturally and language-specific support for pregnant and postpartum patients. Integrate doulas into client care up to one year after pregnancy.
- Provide state-level incentives to health care facilities to hire doulas, and for facilities where they are already employed, provide incentives to assist with or pay for additional trainings that will benefit their doula staff.
- Maintain a directory or statewide online site of culturally specific doulas, including those who speak more than one language, and those who possess mental health and substance use disorder training.

Hospitals and Providers:

- Staff doulas in emergency departments (EDs) to assist with pregnant and postpartum patients.

Ensure pregnant and postpartum people with mental health conditions obtain the services they need to manage their condition.

Mental health services are unavailable to many people in Oregon, including pregnant and postpartum people. Increased need, widespread shortages of providers, insurance barriers, language differences and geographic obstacles account for some of this gap, as do the dearth of providers trained in issues around pregnancy and postpartum. This committee's reviews have shown that mental health conditions are directly contributing to maternal deaths in Oregon.

Systems

- Provide additional funding and greatly expand mental health services throughout the state.
- Approve Medicaid exemptions for pregnant and postpartum patients that allows continuation of care with the same medical providers, including mental health services, after moving to a different county.
- Health care systems should invest in culturally specific health navigation staff who are familiar with mental health (MH) and behavioral health (BH) resources for pregnant and postpartum people and can assist them with accessing the services they need.

Hospitals and providers:

- Embed MH staff in primary and prenatal care clinics and offer pregnant and postpartum patients one-on-one time with a BH clinician before the patient leaves the clinic. Offer MH/BH telehealth visits as an alternate method for providing services.
- Provide increased MH screening at prenatal and postpartum visits.
- Within EDs, incorporate culturally responsive personal health navigators, doulas, traditional health workers, and peer support specialists to accompany pregnant and postpartum patients throughout their visit and assist them with obtaining MH/BH services and resources.
- Within Oregon health care facilities, especially those areas with decreased MH/BH capacity, provide MH first aid training to delegated staff that will remain with pregnant and postpartum patients during a MH crisis until additional assistance is available.
- Implement protocols to alert ED providers about pregnant and postpartum patients that will require further MH services beyond the ED.

Exposure to domestic violence (DV) and abuse increase the risk of mental health disorders, increasing the risk for post-traumatic stress disorder, depression, anxiety, substance use, and suicidal behaviors.[10]

- Ask about DV/intimate partner violence at every annual exam, multiple times during prenatal care visits, at birth admissions, and during postpartum health encounters.
- Partner with DV advocacy groups to ensure culturally specific wrap-around support for DV survivors (e.g., mental, emotional, physical, social needs).

10. Howard LM, Trevillion K, Agnew-Davies R. Domestic Violence and Mental Health. Int Rev Psychiatry (2010) 22:525–34.

Community:

- Allocate state and county funding to community-based organizations (CBOs) and support groups that provide culturally specific MH resources aimed at pregnant and postpartum people.
- Allocate state and county funding to peer mentorship, counseling, and outreach for pregnant and postpartum people with MH issues.
- Create partnerships between home visitors (e.g., Family Connects Oregon, a universally offered home visiting program) and CBOs that support pregnant patients, especially in areas where MH capacity may not always be readily available in clinics and EDs.

Ensure pregnant and postpartum people with histories of substance use disorders obtain the services they need to manage their condition.

Systems:

- Provide additional funding and greatly expand statewide proactive and non-punitive addiction treatment programs (e.g., Nurture Oregon) for pregnant and postpartum people.
- To decrease gaps in care coordination and assist with maneuvering through the health care system, public and private health insurance should provide for case management and peer support specialists during pregnancy and at least 12 months postpartum to assist patients with histories of substance use disorders (SUD).

Child welfare improvements today help prevent negative intergenerational outcomes, including supporting healthier birth outcomes in the next generation.

- Identify high-risk children and adolescents, including their families, and offer support through child welfare systems that include harm reduction principles and outreach support services.
- Support improvements in quality of life for adults that experienced adverse childhood events (ACEs), such as physical abuse and family substance use, to assist with long-term prevention of maternal mortality and morbidity.

Hospitals and providers:

- Encourage hospitals and clinics to increase MH and social workers to provide counseling and treatment services tailored for pregnant and postpartum patients who have SUD histories. Incentive funding should be provided to

hire culturally diverse peer support specialists, doulas, and traditional health workers to assist pregnant and postpartum patients with maintenance of prescribed treatments and access to services and SUD resources.

- Provide hospital and clinic staff with additional training and resources about SUD in pregnancy and educate providers about community programs for pregnant and postpartum patients who struggle with addiction.
- Incorporate peer support specialists that can be present at hospital admissions and ED arrivals of known pregnant and postpartum people with histories of SUD. Peer support specialists should remain with the patient throughout their ED visit and assist with transfer out of the facility and into treatment and management services.
- Ensure screening for drug and alcohol use is routinely performed at health care visits, establish a schedule that provides increased screening for at-risk patients, and monitor the process.

Community:

- Allocate state and county funding to CBOs that provide resources for SUD. Encourage partnerships between public health home visitors and addiction outreach systems to support and build relationships with pregnant and postpartum people with substance use and/or alcohol addictions.
- Support culturally specific peer outreach that offers recovery mentors and implements harm reduction activities to pregnant and postpartum people with SUD/MH conditions.
- Since unresolved grief during pregnancy and postpartum can lead to SUD and MH conditions, emphasize the need for resources for grieving individuals in pregnant and parenting populations.

Strongly consider an autopsy after the death of a pregnant or postpartum person.

When a pregnant or postpartum person suddenly dies, it is a deeply difficult time for all involved, including caregivers as well as family. An autopsy can add invaluable knowledge that could be used to help prevent future deaths. However, having an autopsy performed is often overlooked; only 51% of all reviewed deaths had an autopsy for review.

Systems:

- To increase knowledge surrounding the causes of maternal deaths, the state could ensure a funding mechanism for autopsies of pregnant and postpartum people.
- Create and share trainings and resources about conditions specific to deaths

during and after pregnancy with individuals in Oregon who perform autopsies.

Hospitals and providers:

- Hospitals should review their autopsy protocols and revise them to specifically include inpatient and ED deaths involving people who die during pregnancy or the following year.
- Protocols should include documentation in the patient's medical record about the reason why an autopsy was not performed on an otherwise healthy pregnant or postpartum person during a hospital stay or ED visit.
- Convey messaging and provide training to providers about the importance of autopsies on pregnant and postpartum patients who die during hospital care.
- Designate hospital staff with expertise in grief counseling to assist the provider when presenting the options and reasons for an autopsy to family members. Designated staff should be knowledgeable about the autopsy process, funding for the procedure, and how family members may obtain culturally specific grief counselling.

Four New, Large-Scale Positive Actions for Pregnant and Postpartum People in Oregon

The subject of maternal mortality is often difficult to explore. During case review meetings, committee members must discuss what are often heartbreaking circumstances about a person's life and death. This report summarizes the tragic findings that have been identified during committee reviews. This section highlights four actions that have taken place within the last two years that represent large improvements for pregnant and postpartum people in our state.

These actions are steps forward in addressing some of the strategies recommended by the MMRC for prevention of maternal deaths.

Universally Offered Home Visiting Initiative (Family Connects Oregon)

Oregon is the first state to launch a universally offered nurse home visiting program. Family Connects Oregon is a family-centered, evidence-based service that will be available to every family with a newborn in Oregon. The program was first implemented in 2021 and is currently available in eight early adopter counties: Benton, Lincoln, Linn, Crook, Jefferson, Deschutes, Washington and Marion. As with all nurse home visiting programs, family participation is voluntary. More information is located at https://www.familyconnectsoregon.org.

Nurture Oregon

Nurture Oregon is a care model integrating maternity care, addiction treatment and social services coordination for pregnant and postpartum people with substance use disorders. The mission of Nurture Oregon is to keep families healthy and unified by providing quality, integrated care. The program envisions "a state where pregnant people who use substances receive safe, supportive, stigma-free care."

As a pilot program in Multnomah County, this supportive model was found to be associated with increased prenatal care visits, reduction in child maltreatment, reduction in foster care placement, and cost savings. The Oregon legislature recognized these successes and mandated the program's expansion with a focus on rural and frontier counties and those with more BIPOC people to better reach underserved families. Nurture Oregon was expanded in 2021 to five counties across the state and provides prenatal, pregnancy, and postpartum care and pediatric care for a client's infant while simultaneously providing treatment for substance use disorders. More information is located here: Nuture Oregon Progress

Medicaid Coverage Extended to 12 Months

In 2022 a new policy was implemented in Oregon that expanded postpartum insurance coverage from only 60 days to a full 12 months for individuals that receive Oregon Health Plan (OHP) benefits during pregnancy. The benefit period is determined by the pregnancy due date or end date and coverage is not dependent on the pregnancy outcome. This allows individuals to maintain continuous coverage for 12 months following pregnancy and access services such as clinical care and behavioral health services.

Another new policy in 2022 provides this extended coverage to some individuals who would not otherwise have access to the full year of postpartum care due to their immigration status. The Healthier Oregon program enables income-qualifying adults ages 19–25 (and 55 and older) to now be eligible for full OHP benefits and other services and supports, regardless of their immigration status. Previously, individuals in that age group who were ineligible for OHP based on their immigration status could only obtain coverage under the Citizen/Alien Waived Emergency Medical (CAWEM) program, which is restricted to coverage of life-threatening medical emergencies and pregnancy care and labor and delivery. People in the Healthier Oregon-specific age groups who previously would have only had access to CAWEM coverage now have full OHP coverage, including the postpartum year.

2022–2027 Medicaid 1115 Demonstration Waiver

Eliminating health inequities by the year 2030 is a strategic goal held by the OHA. A major step in moving forward with this goal included the 2022 federal approval of revisions to Oregon's Medicaid 1115 Waiver. The renewed and revised waiver addresses health-related social needs for eligible individuals and families with Medicaid coverage that are at risk of losing access to health care due to life transitions. Services provided may include housing support, nutritional assistance, and protection from climate change events. Oregon is one of only two states that are launching this innovative change to improve key social determinants of health.

Inadequate housing during and after pregnancy can result in missed opportunities for health care and other services, can result in food insecurities, and can lead to decreased safety. Pregnant individuals who do not have stable housing often face implicit biases from others. This initiative is a pathway to support underserved pregnant and postpartum populations.

These health-related social needs services are expected to begin in 2024–2025. More information can be located on the following link:
https://www.oregon.gov/oha/hsd/medicaid-policy/pages/waiver-renewal.aspx

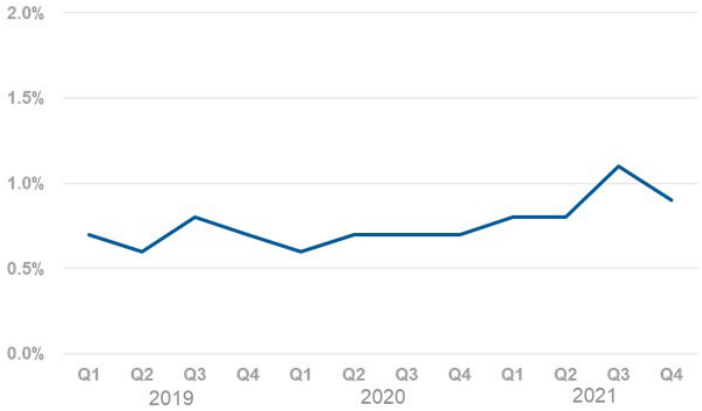
Severe Maternal Morbidity

In addition to reviewing cases of maternal mortality, Oregon's MMRC program is tasked with studying the incidence of severe maternal morbidity in Oregon. Severe maternal morbidity is defined by the Centers for Disease Control and Prevention as "unexpected outcomes of labor and delivery that result in significant short- or long-term consequences to a woman's health." This encompasses very serious health conditions that, even with timely intervention, have detrimental impacts and could result in maternal death. A term for the most severe of these is a "near miss" for maternal mortality — that is, the individual came close to dying. It is estimated that for every case of a pregnancy-related death, there are ten cases of severe maternal morbidity.

Like maternal mortality, there are some situations in which severe maternal morbidity is preventable. Therefore, it is important to examine the incidence of severe maternal morbidity as part of the effort to prevent situations and complications that can lead to death. Said another way, tracking and understanding patterns of severe maternal morbidity, along with developing and carrying out interventions to improve the quality of maternal care, are essential to reducing both severe maternal morbidity and maternal mortality.

Increases in pregnancy-related complications throughout the United States may be, in part, connected to changes in the overall health of the population of people giving birth. Some risk factors that are increasing are pre-pregnancy obesity, preexisting chronic medical conditions, cesarean deliveries, and older maternal age. Risk factors and complications can result in family trauma, increased medical costs and longer hospital stays.

Severe maternal morbidity* as percentage of delivery hospitalizations by quarter, 2019-2021

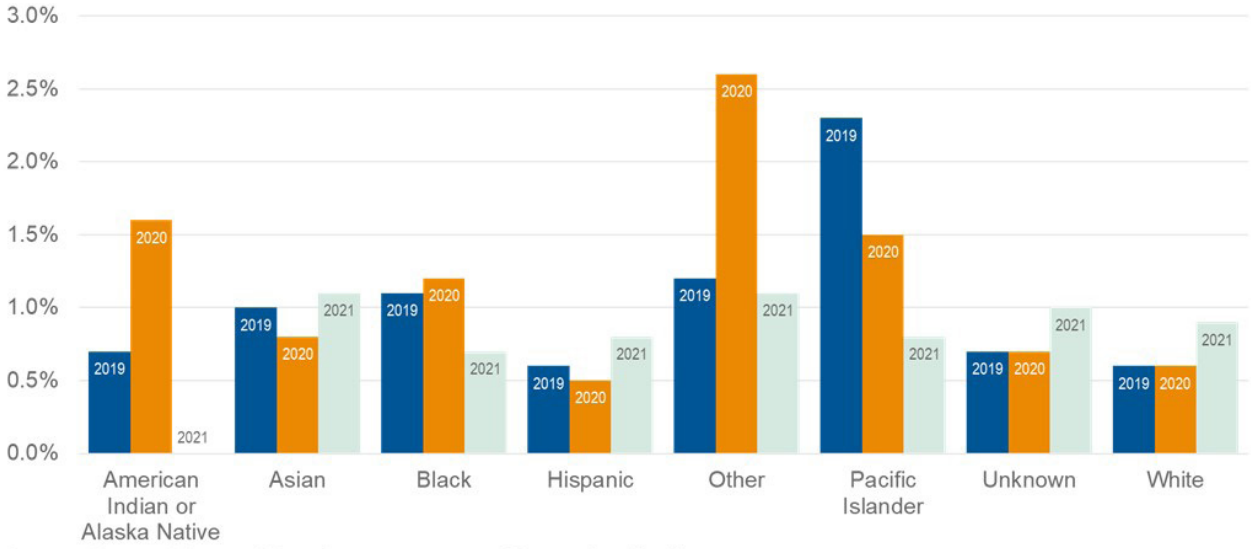


Source: Oregon Maternal Data Center, courtesy of Comagine Health
*Excludes transfusion-only cases

For this report, we utilized findings on severe maternal morbidity from the Oregon Maternal Data Center (OMDC), a collaborative effort between March of Dimes, Comagine Health, and the Oregon Perinatal Collaborative. Staff from OHA and

the MMRC are on the steering committee for the Oregon Perinatal Collaborative. This data tool generates hospital-level quality improvement metrics for maternity care and outcomes using data directly from hospitals. Twenty-nine birthing hospitals are enrolled in the OMDC, representing approximately 75% of births each year statewide. Severe maternal morbidity in delivery hospitalizations were identified using a nationally validated list of 21 clinical indicators and their corresponding diagnosis or procedure codes. An overview describing the maternal morbidity rate over three years and how it manifested in race and ethnicity groups in Oregon is shown in the accompanying figures. Note that race and ethnicity data from hospital records can be of variable quality and is collected and categorized differently from similar data contained in public health vital records.

Severe maternal morbidity* as percentage of delivery hospitalizations by race/ethnicity, 2019-2021



Source: Oregon Maternal Data Center, courtesy of Comagine Health
*Excludes transfusion-only cases
**Interpret annual percentages with caution as population sample sizes in all groups except Hispanic and White were small

The severe maternal mortality rates for the three-year period were relatively consistent with a slight rise over time; however, more years of data will be helpful in establishing whether this is an ongoing trend and in determining key areas for quality improvement and potential prevention statewide. The lowest rates of severe maternal morbidity were for Hispanic people, followed by those identified as White. Overall, the highest severe maternal morbidity rates were seen among people identified as Pacific Islander or other race/ethnicity, followed by American Indian or Alaska Native, Asian, and Black. However, small numbers of cases for many of these groups make annual rates unstable and comparisons need to be made with caution.

These initial findings provide an overall snapshot of incidence for the years 2019–21. Future analysis will utilize a data source encompassing all hospitalizations in Oregon.

Appendix A

Executive Appointment Board Roster

Member Name	Committee Position
LaRisha R Baker	Public Health Expert
Melissa J Cheyney	Licensed Direct Entry Midwife
Sarah E Cole	Licensed Registered Labor and Delivery Nurse
Nafisa N Fai	Member At Large
Alivia M Feliciano	Doula
Amie L Keys	Medical Examiner (Deputy)
Jackie Leung	Traditional Health Worker
Nancy J MacMorris-Adix	Licensed Registered Nurse and Certified Midwife
Lesa R O'Dell	Maternal and Child Health Subject Matter Expert on OHA
Maria I Rodriguez	OB/GYN Physician / MMRC Chairperson
Jeanne S Savage	Family Medicine Physician
Brandon M Togioka	Member At Large
Mark W Tomlinson	Maternal Fetal Medicine Physician
Rick Treleaven	Community Based Organization Representative (Mental Health)
Ana del Rocío Valderrama	Community Based Organization Representative (Communities of Color)

Appendix B

Glossary

Pregnancy-related mortality ratio:
Number of pregnancy-related deaths per 100,000 live births.

Pregnancy-associated, but not related death:
A death during pregnancy or within one year of the end of pregnancy from a cause that is not related to pregnancy. (CDC Maternal Mortality Review Committee Decisions Form v.22)

Pregnancy-related death:
A death during pregnancy or within one year of the end 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. (CDC Maternal Mortality Review Committee Decisions Form v.22)

Preventability:
A death is considered preventable if the committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system and/or community factors. (CDC Maternal Mortality Review Committee Decisions Form v.22)

Oregon Health Authority
PUBLIC HEALTH DIVISION
Maternal and Child Health

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