DPH

Bureau of Family Health & Nutrition

2019-2023 Data Brief
The Maternal Mortality and Morbidity Review Committee

June 2026

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Dedication

The Massachusetts Department of Public Health (DPH) expresses its gratitude to the countless advocates and partners who have championed the purpose of the Massachusetts Maternal Mortality and Morbidity Review Committee (MMMRC) to generate quality data to prevent maternal mortality. Thank you as well to the Committee for thoughtfully reviewing each of the deaths and developing recommendations that can save lives.

It is with deepest sympathy and respect that we dedicate this report to the memory of those 153 people who died while pregnant or within one year of pregnancy between 2019 and 2023. These are 153 deaths too many. We also dedicate this report to the loved ones of these people and all those effected by maternal mortality.

We know our efforts to further understand the causes and contributing factors of maternal mortality in Massachusetts will prevent future deaths.

Executive summary

- The MMMRC identified 153 pregnancy-associated deaths during 2019–2023; 69 were determined to be pregnancy-related deaths (PRDs).
- The pregnancy-related mortality ratio (PRMR), defined as the total number of PRDs per 100,000 live births, was 20.3.
- PRDs are not equally experienced by all groups. The PRMR was more than twice as high for Black non-Hispanic people (41.8) as for White non-Hispanic people (17.9).
- Thirteen percent of PRDs occurred during pregnancy, 10% on the day of delivery, 17% between 1 and 6 days after the end of pregnancy, 22% between 7 and 42 days after the end of pregnancy, and 38% from 43 days to 1 year after the end of pregnancy.
- Eighty-six percent of PRDs were considered preventable.
- The leading underlying causes of PRDs were mental health conditions (42%, most of which involved substance use disorder [SUD]), hemorrhage (19%), and infection (7%).
    - The leading underlying cause of PRDs among Black non-Hispanic birthing people was hemorrhage (40%), and among White non-Hispanic birthing people was mental health conditions (49%) most of which had substance use disorder.
- The MMMRC determines whether certain circumstances surrounded the death:
    - Discrimination, defined as treating someone less or more favorably based on the group, class, or category they belong to resulting from biases, prejudices, and stereotyping, contributed or probably contributed to 41% of PRDs.
    - Mental health conditions contributed or probably contributed to 41% of PRDs.
    - SUD contributed or probably contributed to 45% of PRDs.
    - Lack of continuity of care/care coordination contributed to 22% of PRDs.

Background

What are Maternal Mortality Review Committees?

These state and local level multidiscplinary groups aim to:

- Comprehensively review deaths that occur during or within 1 year after pregnancy
- Determine pregnancy-relatedness and identify contributing factors
- Recommend strategies to prevent future deaths

The Committees use multiple data sources including:

- Linked birth/fetal death and maternal death records
- Medical records
- Other relevant records

Maternal Mortality and Morbidity Review Committee in MA

The Maternal Mortality and Morbidity Review Committee, with support from the Maternal Mortality and Morbidity Review Team (MMMRT) at DPH, uses various data sources to identify all deaths of people while pregnant or within a year of the end of a pregnancy (pregnancy-associated deaths), regardless of the cause of death.

The MMMRC reviews the deaths to identify the cause of death, determine if the death was pregnancy-related and/or preventable, identify contributing factors, and develop recommendations to prevent future deaths.

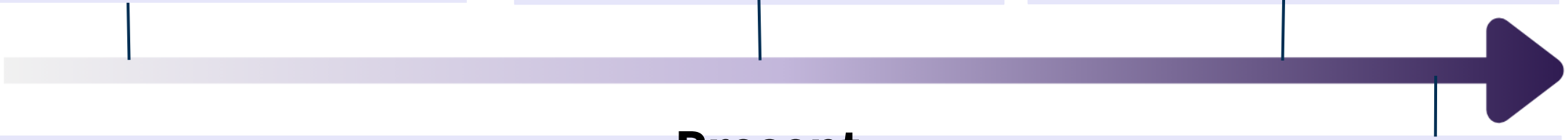
MA MMMRC partners with the CDC's Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) team.

Historical and current context for MMMRCs in the U.S.

1941
Committee on Maternal Welfare of the MA Medical Society initiated case reviews of maternal deaths

1997
High profile deaths led to establishing DPH-led MMMRC with clinical and medical focus

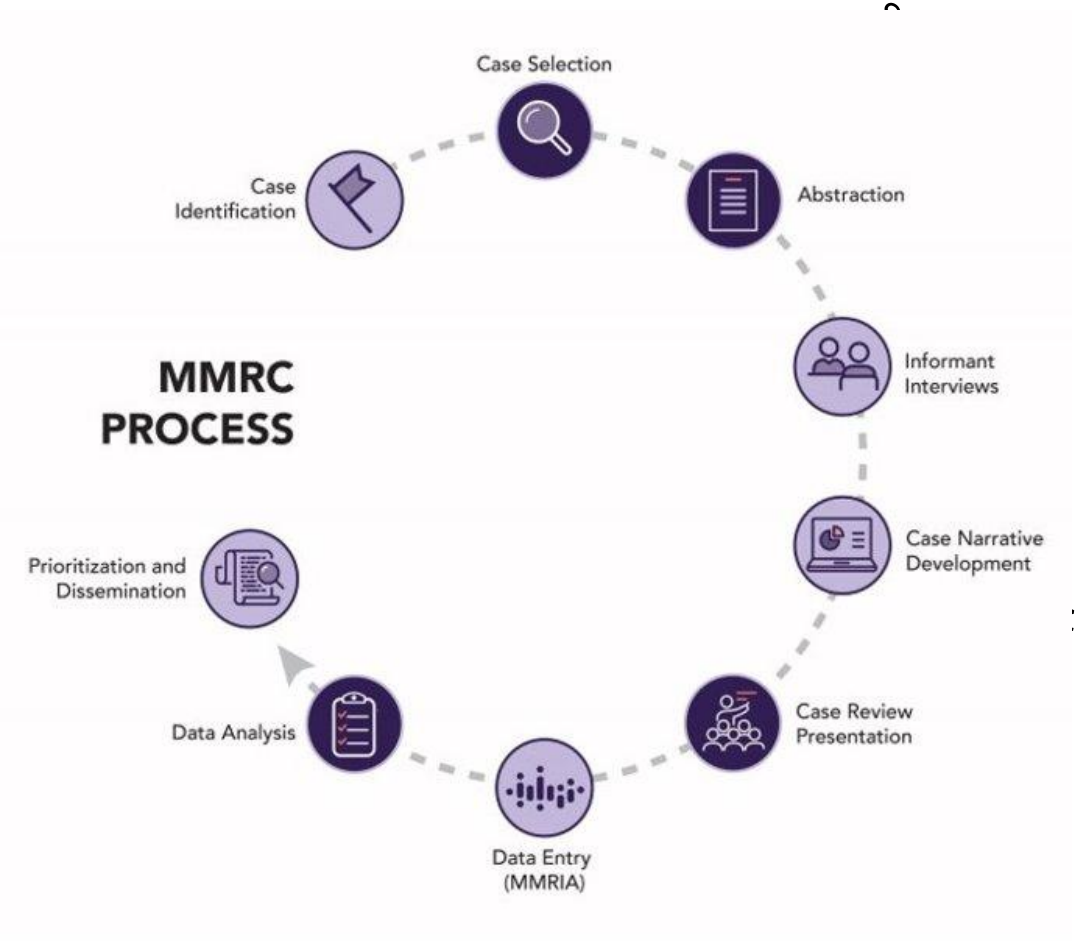
2019
MA collaborated and CDC has made 52 awards, supporting 46 states and 6 U.S. territories and freely associated states for the ERASE MM program



Present

MA's MMRC was written into legislation and state funding with membership assignment. This includes reporting on both mortality and morbidity, thus the name Maternal Mortality and Morbidity Review Committee. As well as legislation calling for the Committee include lived experience. Focus is clinical and SDOH considered.

Gold standard for state-based data on maternal mortality



Part of an ongoing quality improvement cycle

Incorporates multidisciplinary expertise, typically staffed by/hosted by public health agency

Leads to understanding of the drivers of a maternal death and determination of what interventions will have the most impact at patient, provider, facility, system, and community levels to prevent future deaths

Guiding questions for MMMRCs

- Was the death pregnancy related?
- What factors contributed to the death?
- Was the death preventable?
- What public health and clinical strategies might prevent future deaths?

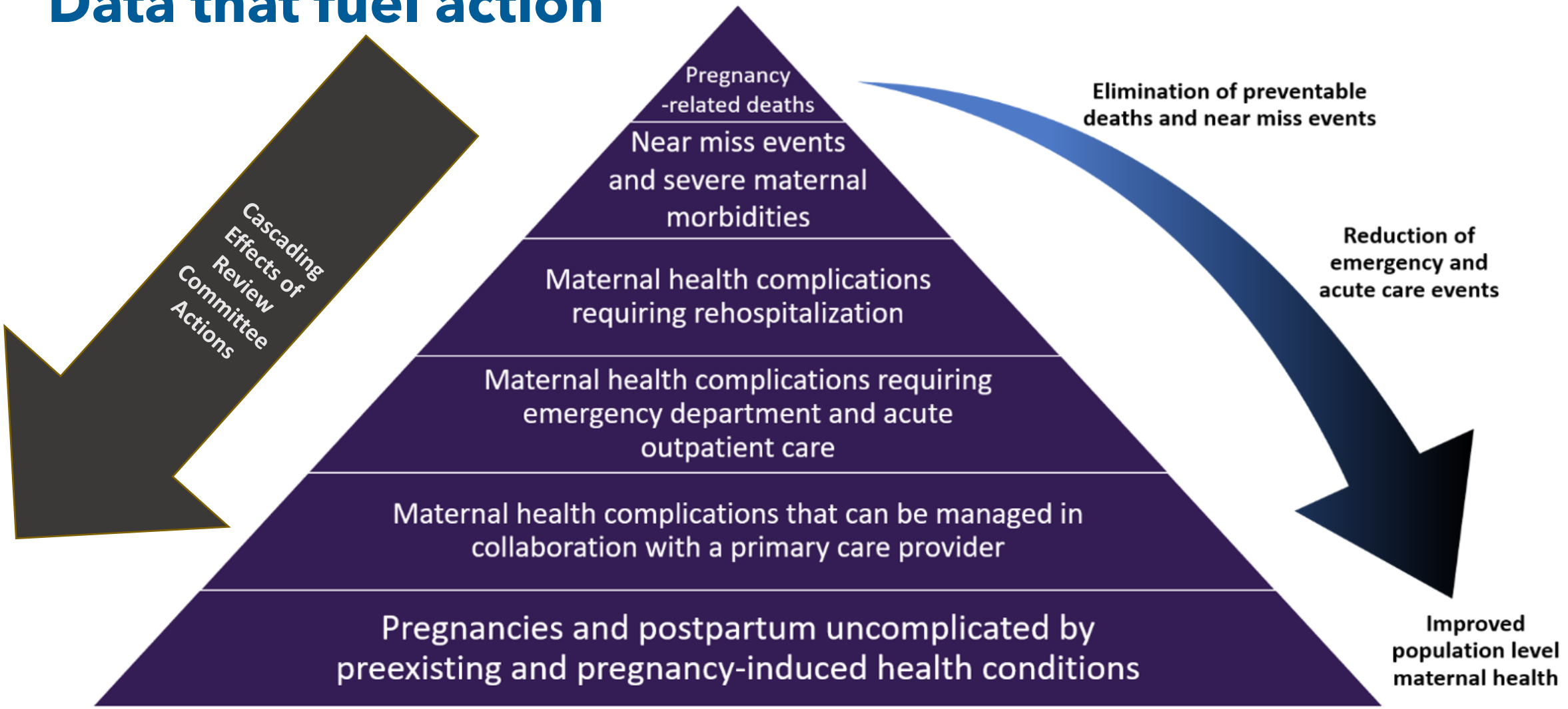
Data that fuel action

While pregnancy-related deaths are among the most extreme outcomes, they're just the tip of the iceberg.

In the US, there are about 50,000 people that experience severe maternal morbidities each year. Beyond this, there are countless other people that experience less severe complications that still require significant medical care and recovery.

We believe that by comprehensively reviewing every death and developing and implementing recommendations, Maternal Mortality Review Committees can help eliminate prevent future deaths, reduce morbidities, and improve population-level maternal health.

Data that fuel action



Borrowed from CDC's Maternal and Infant Health Branch, ERASE MM

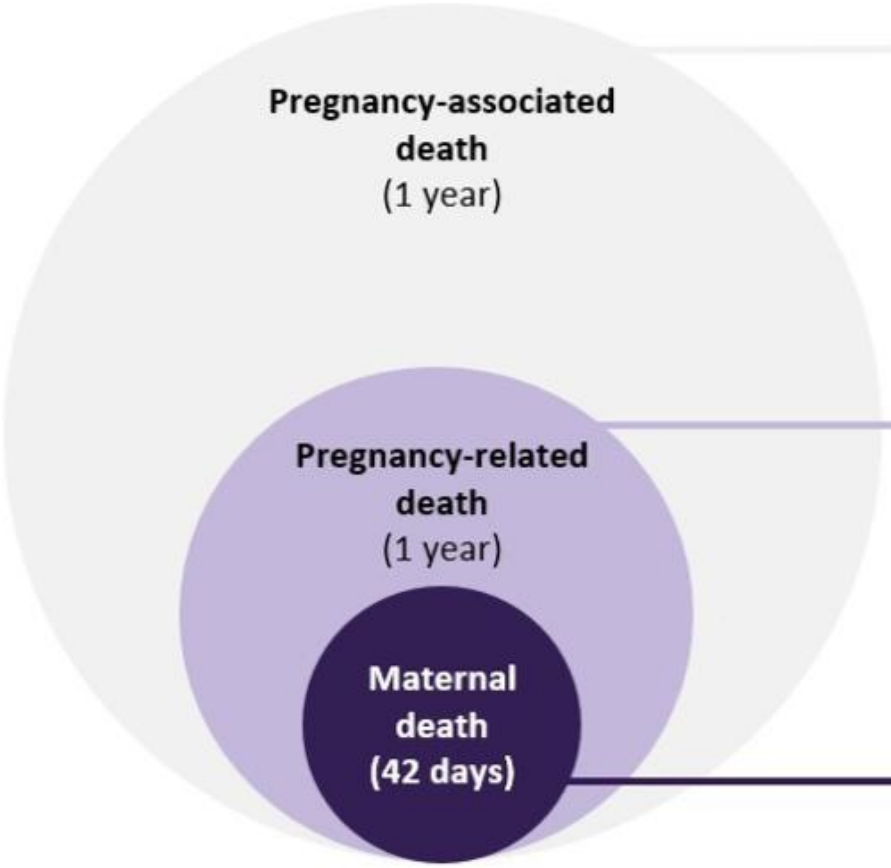
Key definitions

Pregnancy-related deaths

This report focuses on **pregnancy-related deaths.** This is because this population has unique causes of death and for which opportunities exist for prevention within the sphere of maternal health focused programs, policy, and systems.

No one else is focusing on these deaths and committee expertise lies in pregnancy-related death.

Key definitions of maternal mortality



Pregnancy-associated death:
Death during or within 1 year of pregnancy, regardless of the cause

Pregnancy-related death:
Death during or within 1 year of pregnancy, from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy

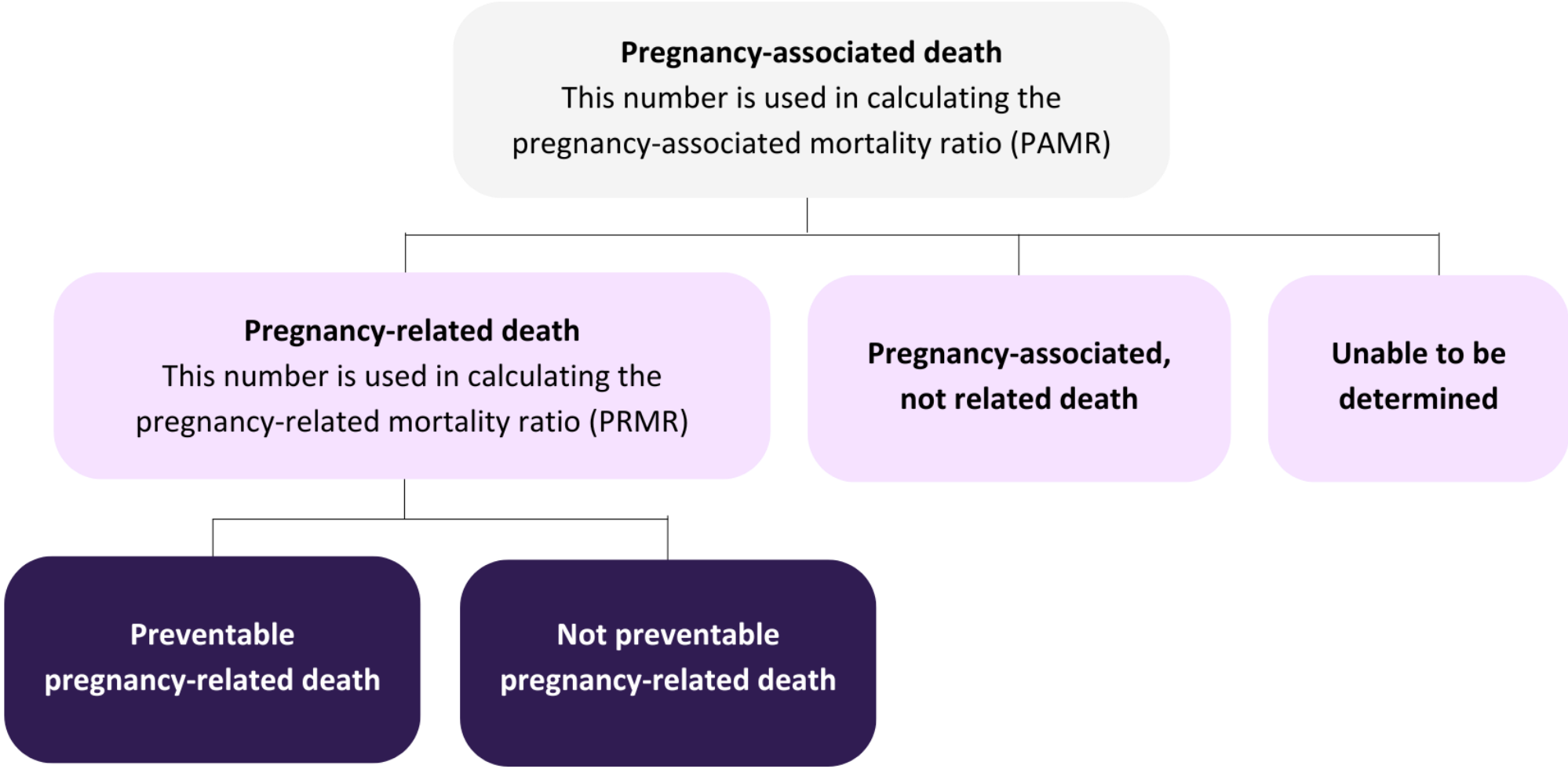
Maternal death:
A death during or up to 42 days after pregnancy, regardless of the duration or site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental causes.

Maternal death classification

As part of the review process, the MMMRC categorizes pregnancy-associated deaths into one of the following sub-categories:

1. Pregnancy-related death
2. Pregnancy-associated, but not related death
3. Unable to determine pregnancy-relatedness

Maternal death classification (continued)



Maternal characteristics of pregnancy-related deaths in Massachusetts between 2019-2023

Pregnancy-related mortality ratio by year, MA, 2019-2023 (N=69)

Maternal mortality by maternal characteristics, MA, 2019-2023 (N=69)

Characteristics	PRMR
Overall	20.3

Age group	PRMR
<20	***
20-24	26.9
25-29	20.7
30-34	12.4
35-39	27.6
40+	35.9

Insurance	PRMR
Private	6.5
Medicaid	42.7
All other types, including self-pay, other government	7.5

Education	PRMR
Less than HS graduate	33.3
HS graduate or GED	50.8
Some college or Associates	22.3
Bachelor's or advanced degree	8.1

PRMR: Pregnancy-related mortality ratio, per 100,000 live births

Disparities in pregnancy-related deaths

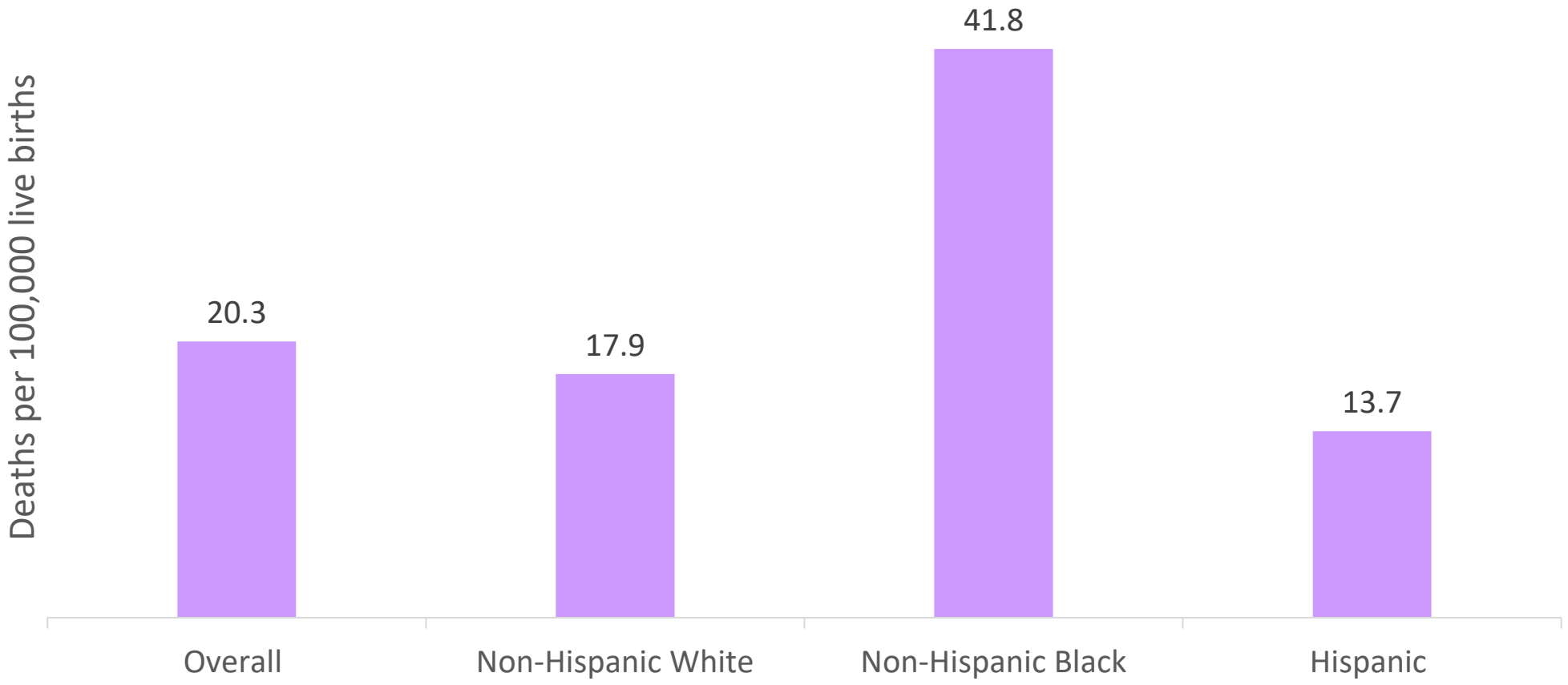
Pregnancy-related deaths do not impact all pregnant and postpartum people equally. By demographics, those that had the highest pregnancy-related mortality ratio were seen among:

- **Age:** People over age 40 (35.9), followed by ages 35-39 (27.6)
- **Education:** People with a high school degree or GED (50.8) compared to all other education categories
- **Insurance:** People with Medicaid/MassHealth insurance (42.7), followed by those with other payment types* (7.5) and private insurance (6.5)

*self-pay, no insurance, other government, etc.

Disparities in pregnancy-related deaths by race and ethnicity

Black non-Hispanic individuals had the highest pregnancy-related morality ratio (41.8), more than twice that of White non-Hispanic individuals (17.9) and more than triple that of Hispanic individuals (13.7).



There are striking racial and ethnic inequities in maternal mortality

Black non-Hispanic individuals have the highest rates of pregnancy-associated and pregnancy-related mortality in Massachusetts.

While we do not have data for the American Indian and Alaskan Native populations, this does not mean that they're inaffected by pregnancy-related deaths. It’s a priority for us to investigate these gaps in the data to improve our reviews.

These inequities reflect, in part, structural and institutional racism, which drive barriers to health care access and marginalization among persons from some racial and ethnic groups.

Key takeaways: Inequities

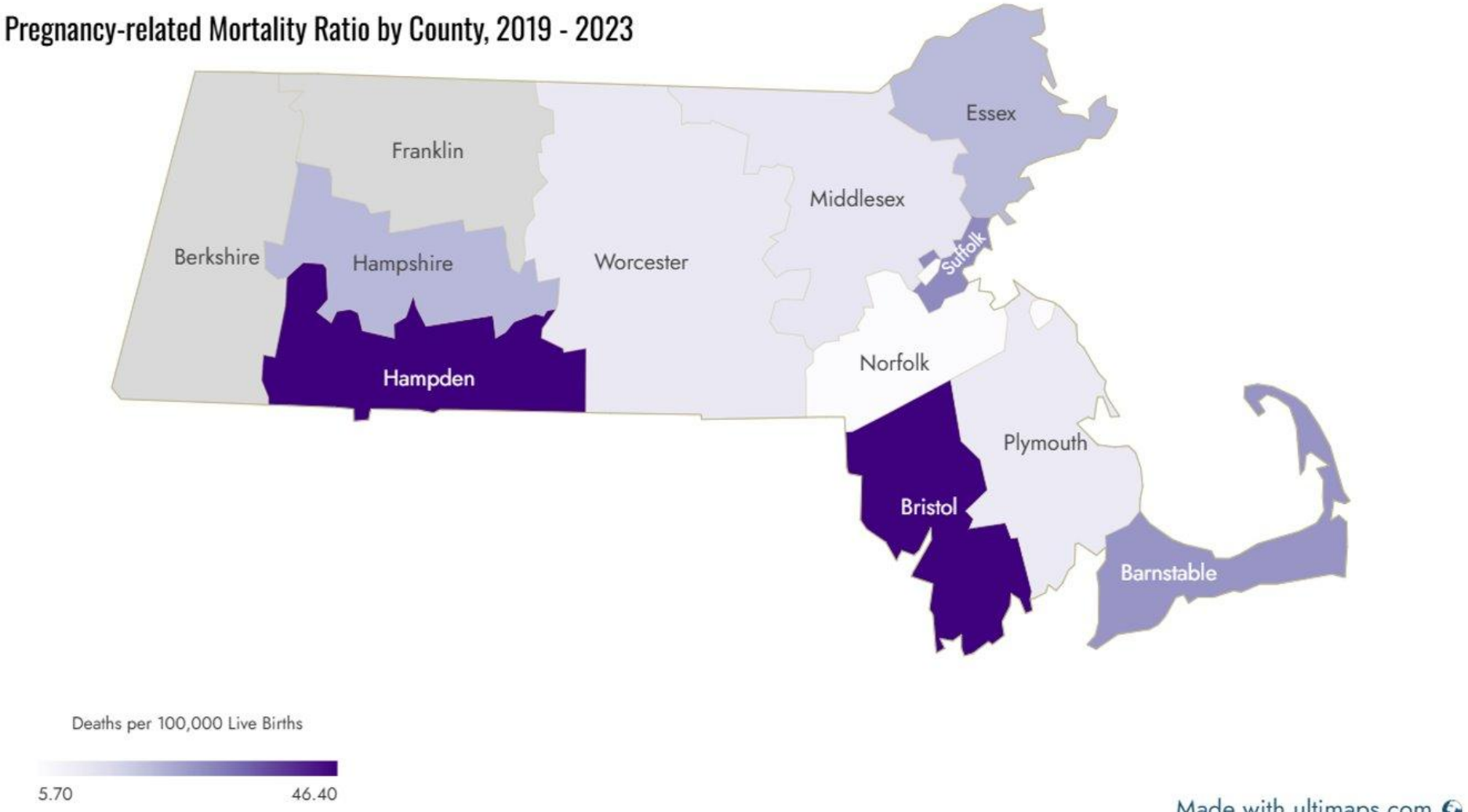
- There are striking racial and ethnic inequities in maternal mortality, with Black non-Hispanic individuals having the highest rates of pregnancy-associated and pregnancy-related mortality in Massachusetts.

- These inequities reflect, in part, structural and institutional racism, which drive barriers to health care access and result in marginalization among persons from some racial and ethnic groups.

- Economic stability is highly correlated with health through wealth, employment, food security and housing stability. MassHealth participants are more likely to be impacted by social determinants of health due to limited financial resources.

Pregnancy-related mortality ratio by county, Massachusetts, 2019-2023

- Rural areas experience more pregnancy-related deaths compared to urban areas.
- Note there are no deaths reported in our data for Franklin, Berkshire, and Dukes counties.
- Bristol and Hampden counties had the highest rates of PRDs, both with about 45/46 deaths per 100,000 live births.
- Worcester and Norfolk counties had the lowest rates of PRDs.



Key takeaways–Risk appropriate care

- Risk-appropriate care is a key strategy to prevent maternal morbidity and mortality by ensuring high-risk pregnant people receive care at a birth facility that is best prepared to meet their needs.
- Obstetric providers might consider consulting with and transfer complicated patients, including those with complex comorbidities, to higher levels of care as soon as problems are identified when the treating hospital does not have the resources and expertise to provide the needed level of care.
- Once the need for transfer is identified, facilities can provide rapid, seamless transfers as soon as the patient is medically stable to ensure timely diagnosis and receipt of an appropriate level of care.
- Continuous collaboration across all levels of maternal care is necessary. Through two-way communication, facilities can provide information back to the transferring hospital after a transfer is received.
- Healthcare systems can help improve outcomes by offering patients enhanced access to family planning services in rural settings (transportation, telehealth follow-up).

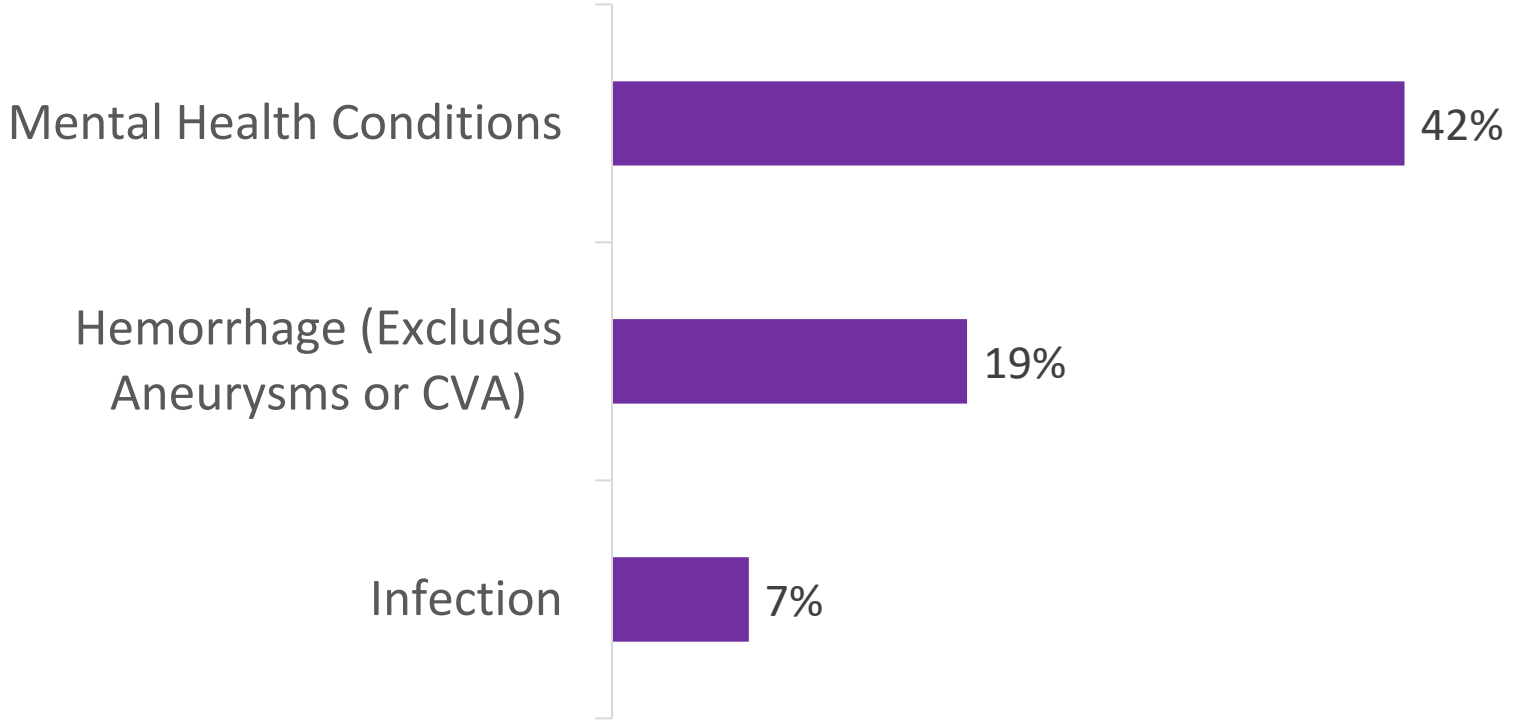
Underlying cause of deaths of pregnancy-related deaths in Massachusetts between 2019-2023

Most frequent underlying cause of pregnancy-related deaths, Massachusetts, 2019-2023

Most “Mental Health Conditions” were coded as having “Substance Use Disorder”

We often see patients use less during pregnancy, experience a loss of custody or have postpartum mood changes and return to use.

With decreased tolerance, these patients are at greater risk for overdose. In our cases, we see a high number of people dying from overdose in the home. Narcan often cannot be found in time.



*CVA: Cerebrovascular Accident

Key takeaways–Harm reduction

- Harm Reduction Kits including Narcan, fentanyl test strips, safe injection items, stickers with the number to call 800-327-5050 or Text "HOPE" to 800327 (The Massachusetts Substance Use hotline) can be distributed to anyone (nursing, recovery coaches, child health workers, etc.) who comes in contact with at risk patients.

- Efforts can be made to ensure that healthcare and Emergency Medical Services personnel are trained annually to provide trauma-informed care and healing centered engagement using a standardized evidence-based curriculum, particularly for pregnant and postpartum people.

- Trauma-informed responses at key trigger points (e.g., loss of custody, court dates) and ensure shared decision-making with the patient can help prevent future pregnancy-related deaths.

- Healthcare systems can ensure health information, especially warning signs of potential serious conditions, are communicated to patients, and where appropriate to their families, in an accessible way. Ideally these communications systems extend across locations where the person might receive care, including ambulatory care systems.

Timing of pregnancy-related deaths in Massachusetts between 2019-2023

Timing of pregnancy-related deaths, MA, 2019-2023

In MA, hemorrhage accounted for about half the deaths in these two periods.

In MA, most of deaths related to substance use occurred in this period

Timing	National MMRC Data	Massachusetts MMRC data
During pregnancy	20%	13%
Day of delivery	9%	10%
1-6 days after the end of pregnancy	14%	17%
7-42 days after the end of pregnancy	29%	22%
43 days after the end if pregnancy	28%	38%

*National MMRC data from Reviews of pregnancy-related deaths in 46 states in 2021

Key takeaways–Postpartum care

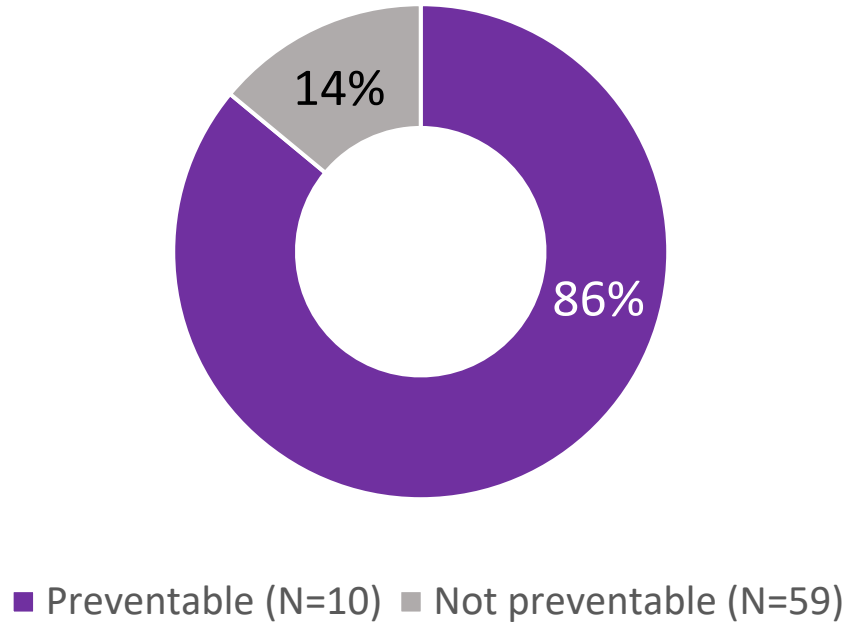
Community-based services and supports in the perinatal and postpartum periods is vital in preventing future deaths. These include doulas, community health workers, home visiting, recovery support specialists, harm reduction programs, and case management for people with complex needs, SUD, or others that would benefit.

Individualized, ongoing, postpartum care for 12 months may reduce pregnancy-related deaths in patients that died postpartum. Focus should be on patients with late entry to prenatal care, multiple missed appointments, or those who left the hospital under self-directed discharge following delivery. Strategies might include engaging doulas, healthcare navigators, case managers, or community health workers.

Dedicate funding for the ambulatory care continuum both before pregnancy and after pregnancy. Currently these tools focus on birthing locations such as hospitals and labor & delivery suites. A healthy and safe pregnancy requires a continuum of care that includes ambulatory care. As our state and national show, most maternal mortality occurs outside of the hospital/birthing location.

Preventability and contributing factors of pregnancy-related deaths in Massachusetts between 2019-2023

Percentage of deaths committee determined to be preventable, Massachusetts, 2019-2023



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:

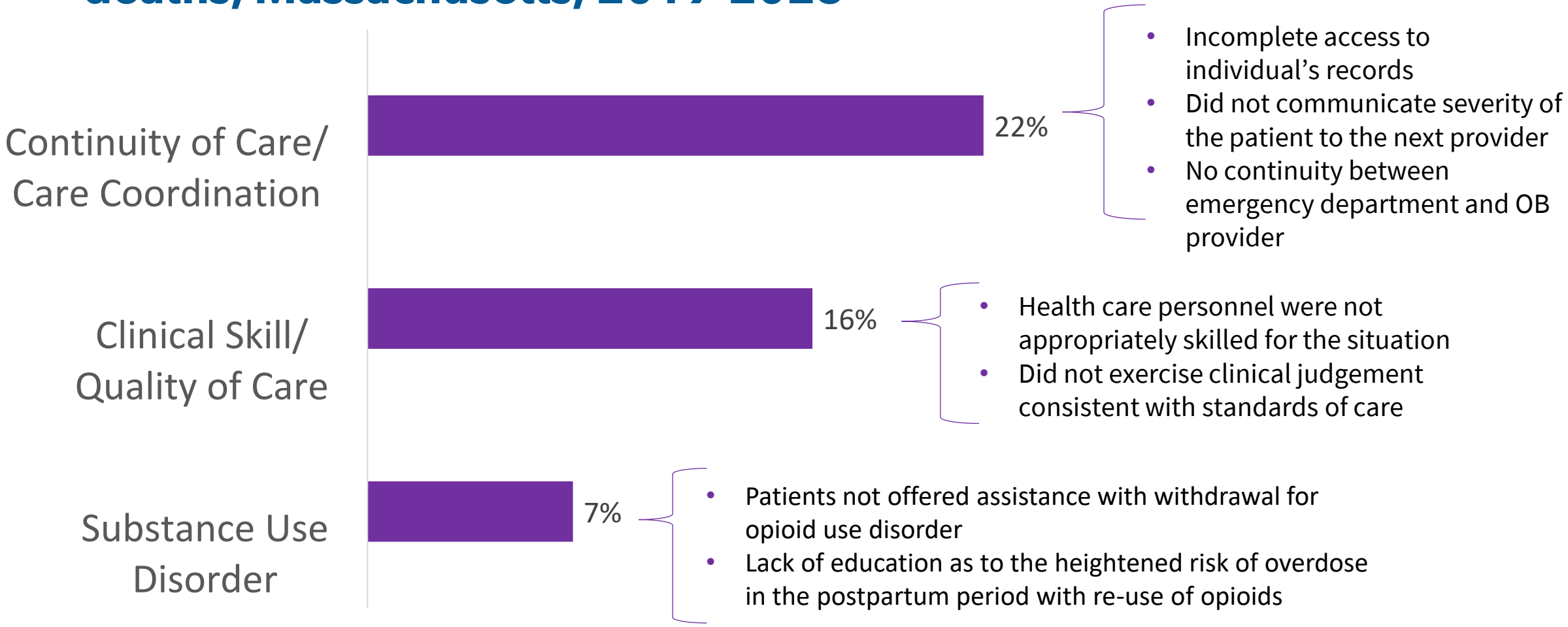
- Patient
- Family
- Provider
- Facility
- System and/or,
- Community factors

Preventability

A **pregnancy-related** death is considered preventable if reasonable changes to any provider, facility, patient, community or systems factors may have helped prevent the death.

These include clinical, social and community factors.

Percentages of top contributing factors for pregnancy-related deaths, Massachusetts, 2019-2023



Key takeaways–Contraceptive healthcare

- Comprehensive and appropriate reproductive and contraceptive healthcare counseling can empower individuals to make informed decisions about their health.
- Healthcare systems should establish protocols to provide postpartum contraception to patients as the patients' desire.
- All insurance providers should cover long-acting reversible contraception (e.g., IUD, implant) immediately after birth and during the postpartum stay.
- Insurers might consider incentivizing providers to ask patients about pregnancy intention at every wellness visit and offer contraception at that visit or referral to a provider who is able to offer contraceptive options.

Committee takeaways–Continuity of care

- Risk-appropriate care is a key strategy to prevent maternal morbidity and mortality by ensuring high-risk pregnant people receive care at a birth facility that is best prepared to meet their needs.

- Once the need for transfer is identified, facilities should provide rapid, seamless transfers as soon as the patient is medically stable to ensure timely diagnosis and receipt of an appropriate level of care.

- Continuous collaboration across all levels of maternal care is necessary. Through two-way communication, facilities can provide information back to the transferring hospital after a transfer is received.

- Obstetric providers should consult with and transfer complicated patients, including those with complex comorbidities, to higher levels of care as soon as problems are identified when the treating hospital does not have the resources and expertise to provide the needed level of care.

Circumstances of pregnancy-related deaths in Massachusetts between 2019-2023

Circumstances surrounding pregnancy-related deaths

There are currently four circumstances reported on. These circumstances are defined as whether:

1. **Substance use disorder**
2. **Mental health condition**
3. **Discrimination**
4. **Obesity contributed to the death**, and not just whether the circumstance was present or experienced.

There are currently 4 circumstances that are reported on:

Substance use disorder is a circumstance that contributed to the death when the disorder directly compromised an individual's health or health care. For example, acute methamphetamine intoxication made preeclampsia worse, or they were more vulnerable to infections or medical conditions.

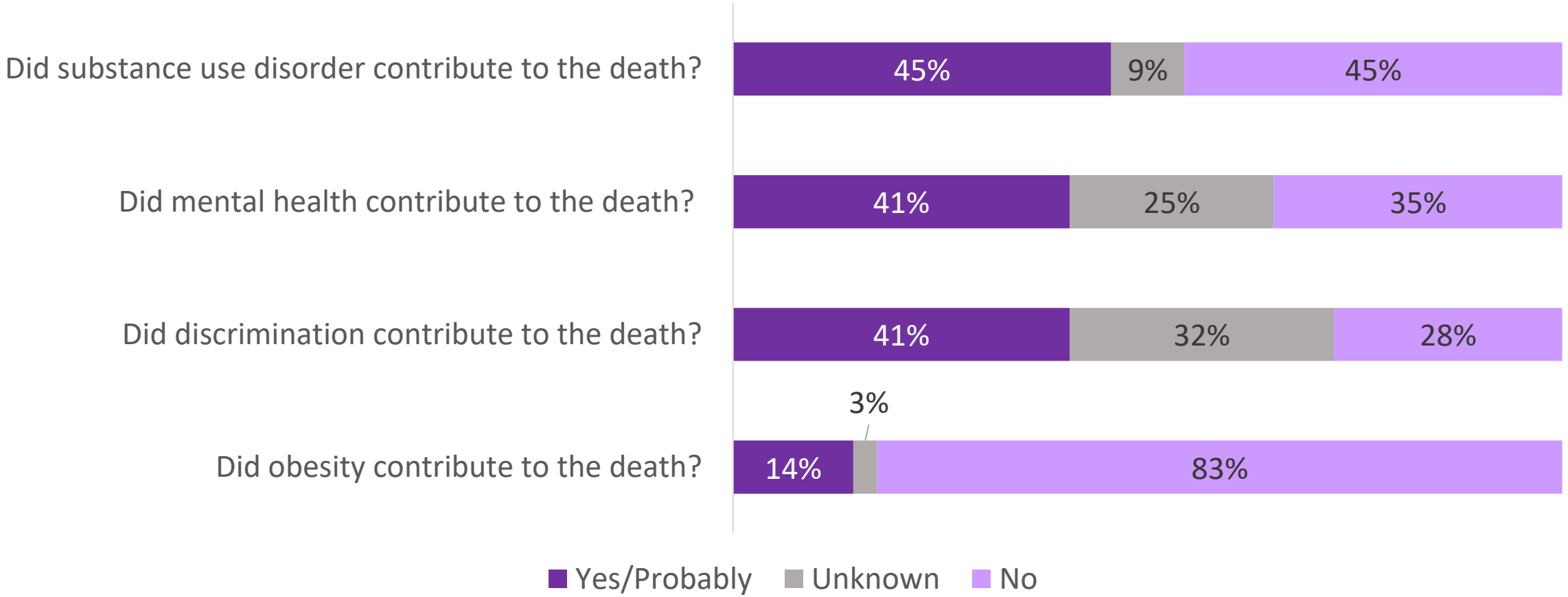
Mental health conditions include when the individual had a documented diagnosis of a psychiatric disorder (such as depressive, anxiety, psychotic, and bipolar disorders). For example, when a mental health condition, such as severe depression, impacted their ability to manage type II diabetes.

4 reportable circumstances (continued)

Discrimination: Defined as treating someone less or more favorably based on the group, class or category they belong to resulting from biases, prejudices, and stereotyping. It can manifest as differences in care, clinical communication and shared decision-making.
For example, dismissing symptoms of abdominal pain described by a person with a history of substance use disorder, which led to a delay in diagnosis and care for ruptured ectopic pregnancy.

Obesity: contributed to the death when the condition directly compromised an individual's health or health care.
For example, obesity complicated ventilation options for a pregnant person with flu.

Committee determination of circumstances surrounding pregnancy-related deaths, MA, 2019-2023



These determinations are not mutually exclusive, and there can be more than one circumstance surrounding a death.

Circumstances surrounding the 69 pregnancy-related deaths (PRDs) between 2019-2023

Substance use disorder contributed or probably contributed to 45% of pregnancy related deaths.

Mental health contributed or probably contributed to 41% of pregnancy related deaths

Discrimination contributed or probably contributed to 41% of pregnancy related deaths

Obesity contributed or probably contributed to 14% of pregnancy related deaths

These determinations are not mutually exclusive.

Key takeaways–Compassionate care

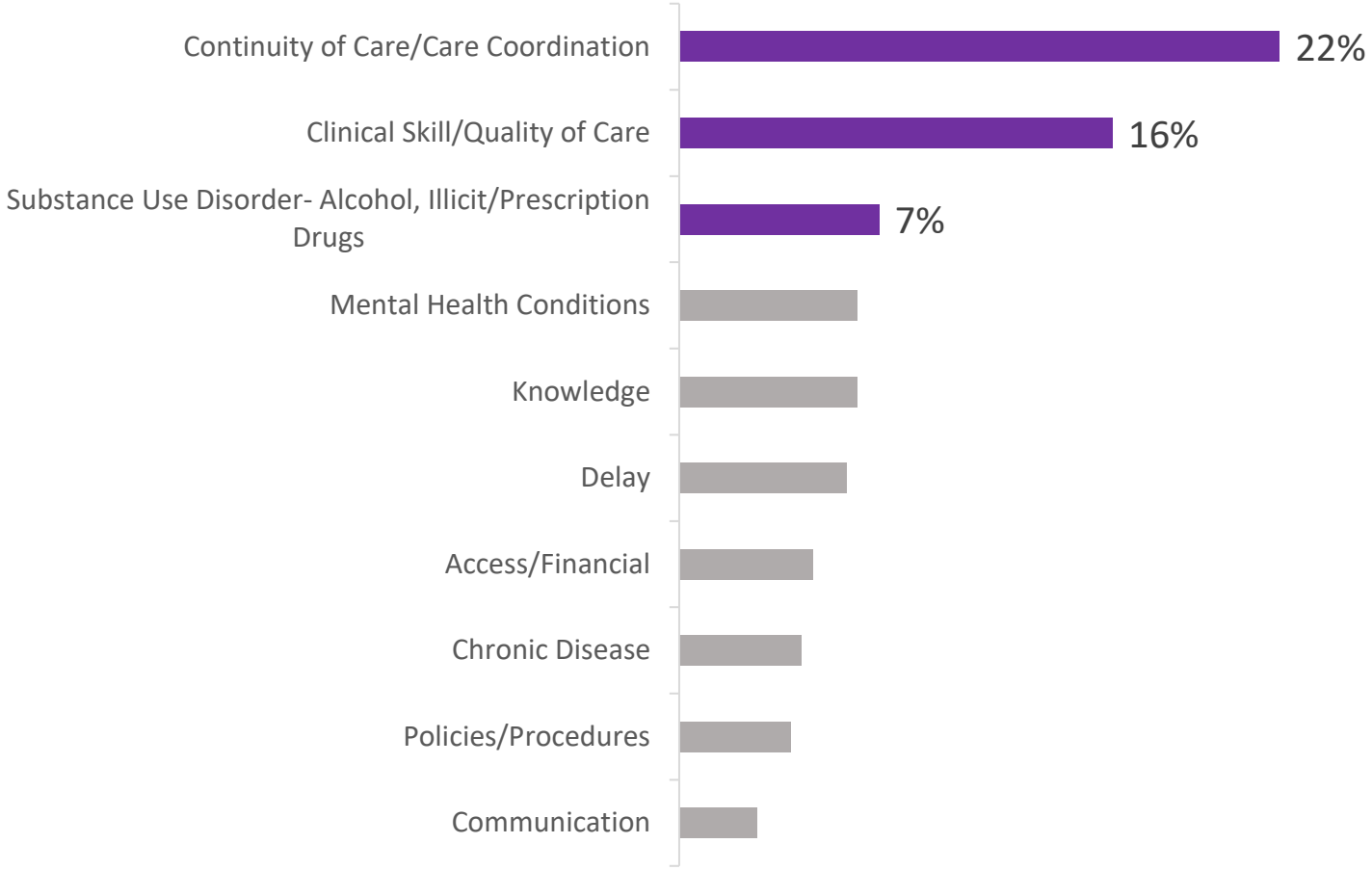
- Providers can use the following services for people actively using drugs: Contact the **Massachusetts Substance Use Helpline** to speak with a specialist at **800.327.5050** or visit the website at https://www.masshelpline.com/. To receive a free comprehensive kit to prevent and respond to an overdose through the home-delivery program, which includes naloxone, fentanyl test strips, and a rescue breathing mask, visit: Naloxone and Overdose Prevention Kit
- Patients might benefit from being offered medical management of withdrawal symptoms (if desired, even if this includes a longer postpartum stay) and a "warm handoff" to a treatment facility with transportation arranged if needed.
- Affirming patient's identity and become aware of their own biases when caring for can help reduce discrimination experienced by patients. This includes having services and equipment that are accessible by all patients, including patients of size and those with disabilities.

- To find services for people actively using drugs, people can contact the **Massachusetts Substance Use Helpline** to speak with a specialist at **800.327.5050** or visit the website at https://www.masshelpline.com/. To receive a free comprehensive kit to prevent and respond to an overdose through the home-delivery program, which includes naloxone, fentanyl test strips, and a rescue breathing mask, visit: Naloxone and Overdose Prevention Kit

Key takeaways–Mental health resources

- State agencies that provide direct services to clients (e.g., Department of Children and Families, Department of Public Health, Department of Mental Health) should implement trauma-informed policies and increase training on behavioral and mental health for all staff, including training on referring clients to treatment for substance use and perinatal and postpartum mental health disorders, as needed.
- All perinatal and primary care providers might consider engaging with their in-house perinatal psychiatry resources or MCPAP for Moms to learn more about mental health care resources to better facilitate access to mental health care during pregnancy and postpartum.
- Funding for postpartum programs is essential to promote continuity of care in the postpartum period, particularly for people with mental health conditions or substance use disorders.

Percentages of contributing factors for pregnancy-related deaths, Massachusetts, 2019-2023



Lack of continuity of care occurred when providers:

- did not have access to an individual's complete records
- did not communicate the severity of the patient's condition sufficiently to the referred/next provider
- did not recognize the severity of the patient's situation

Key takeaways–Care coordination

- Care coordination is a patient- and family-centered, team-based approach designed to assess and meet the needs of patients, while helping them navigate effectively and efficiently through the health care system to achieve optimal health outcomes.
- Coordination of care can be promoted by creating multidisciplinary teams or strengthening referral relationships between OB/GYN, midwives, primary care providers, behavioral health providers, substance use disorder (SUD) treatment providers, specialists, pediatricians, doulas, community health workers, social workers, harm reduction programs and others during and following pregnancy.
- State agencies and local organizations should ensure that homeless shelters and other housing options provide safe spaces for unsheltered/unhoused pregnant and postpartum people, with or without custody. Insurers should cover navigation services for individuals with transportation barriers and include transportation as a covered benefit.
- Insurers should provide incentives to healthcare systems to increase availability of social workers and other trained staff to screen patients for social determinants of health and connect them with appropriate social services, such as transportation, housing, childcare, insurance coverage, or community support groups.

Key takeaways–Continuity of care

- Risk-appropriate care is a key strategy to prevent maternal morbidity and mortality by ensuring high-risk pregnant people receive care at a birth facility that is best prepared to meet their needs.
- Once the need for transfer is identified, facilities should provide rapid, seamless transfers as soon as the patient is medically stable to ensure timely diagnosis and receipt of an appropriate level of care.
- Continuous collaboration across all levels of maternal care is necessary. Through two-way communication, facilities can provide information back to the transferring hospital after a transfer is received.
- Obstetric providers should consult with and transfer complicated patients, including those with complex comorbidities, to higher levels of care as soon as problems are identified when the treating hospital does not have the resources and expertise to provide the needed level of care.

Conclusion

Support: Increase supports for pregnant and postpartum individuals with SUD.

Increase: Increase access to mental health screening and treatment for pregnant and postpartum people.

Implement: Implement initiatives that improve standardization, quality, and coordination of healthcare.

Screen: Support efforts to screen for and address the social determinants of health.

Promote: Support efforts to promote and ensure equitable, respectful, and trauma-informed perinatal care and education. Provide: Provide access to the full range of contraceptive methods and counseling.

Improve: Improve access to information for MMMRC reviews.

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