



# **ERASE MM Data Update: Pregnancy-related Deaths Occurring in 2020**

**Dave Goodman, Maternal Mortality Prevention Team**

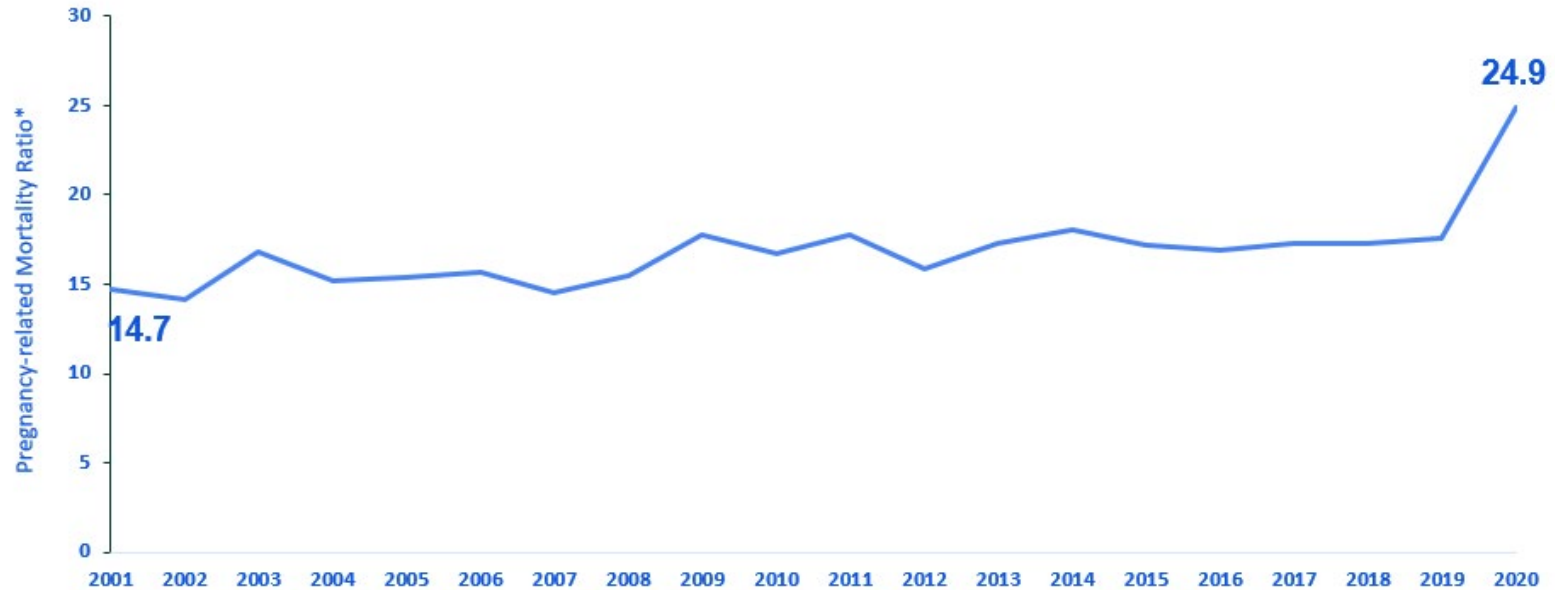
ACIMM

26 June, 2024

# CDC Division of Reproductive Health Pregnancy-related Mortality Surveillance Programs: PMSS and MMRCs

	Pregnancy Mortality Surveillance System (PMSS)
Data Source	Death records, and death records linked birth or fetal death records, additional information as available
Time Frame	During pregnancy – 1 year
Source of Classification	Medical epidemiologists
Terms	Pregnancy-associated, (Associated and) Pregnancy-related, (Associated but) Not pregnancy-related
Measure	Pregnancy-Related Mortality Ratio - # of Pregnancy Related Deaths per 100,000 live births
Purpose	Analyze clinical factors associated with deaths, publish national information that supports interpretation and uptake of information among clinical & public health practitioners

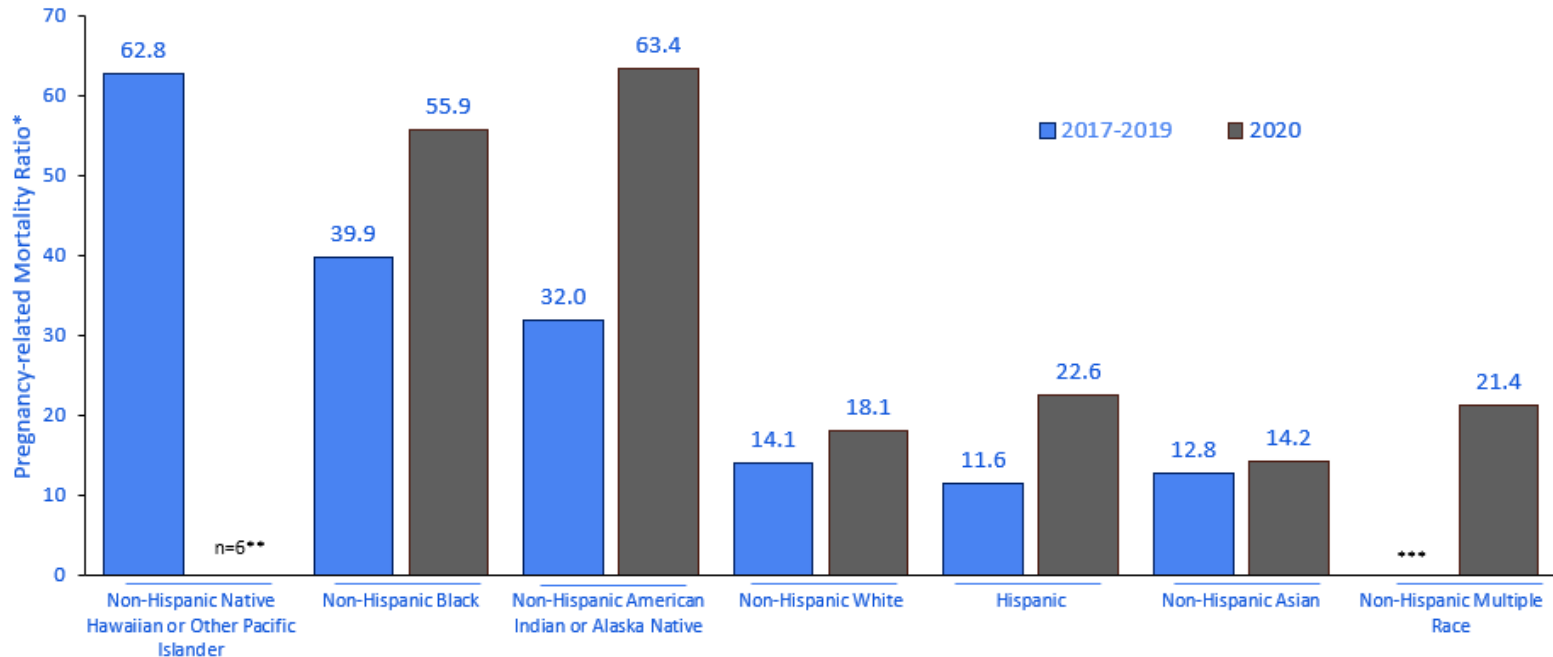
# Pregnancy-related Mortality Ratio by Year: 2001-2020, Pregnancy Mortality Surveillance System (PMSS)



\*Pregnancy-related deaths per 100,000 live births

<https://www.cdc.gov/maternal-mortality/php/pregnancy-mortality-surveillance/index.html>

# Pregnancy-related Mortality Ratio by Race-ethnicity, 2017-2019 and 2020, PMSS



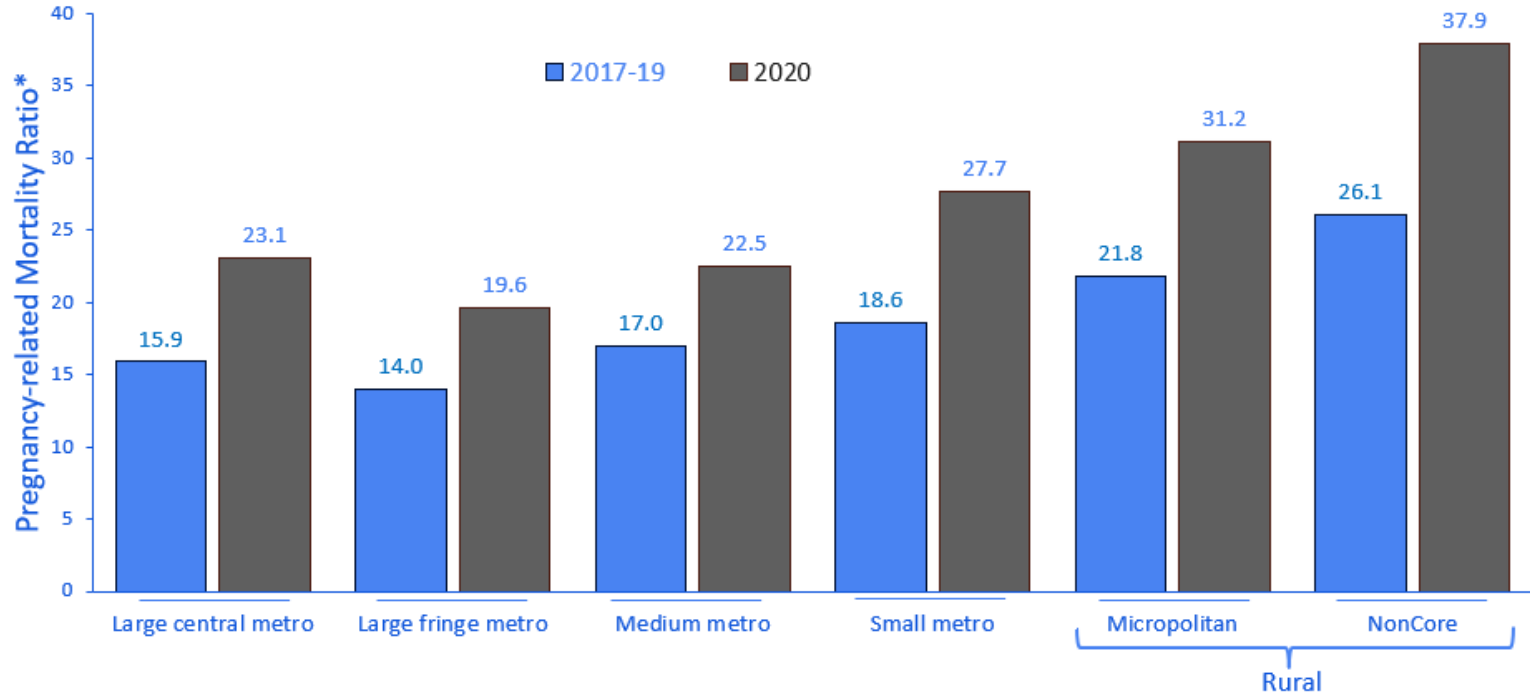
Race or ethnicity was missing for 1.4% of pregnancy-related deaths in 2017-2019 and 0.3% in 2020.

\* Pregnancy-related deaths per 100,000 live births

\*\*The pregnancy-related mortality ratio was not calculated for persons identified as non-Hispanic Native Hawaiian or Other Pacific Islander because we consider counts fewer than 8 as producing a pregnancy-related mortality ratio not reliable enough for reporting.

\*\*\*Those identified as biracial and multiracial are grouped as multiple race. This race-ethnicity classification was not available from 2017-2019 PMSS data.

# Pregnancy-related Mortality Ratio by Urban-Rural Classification, 2017-2019 and 2020, PMSS



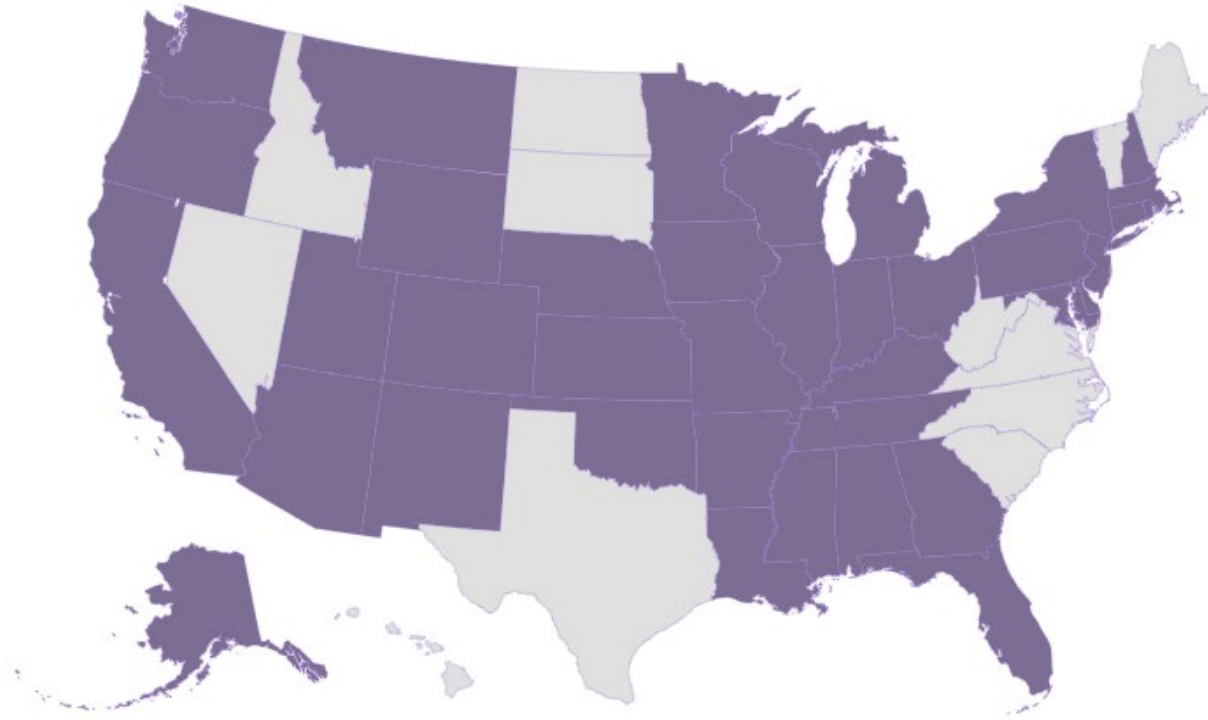
\* Pregnancy-related deaths per 100,000 live births

Urban-rural classification was missing or unknown for 2.4% of pregnancy-related deaths in 2017-2019 and 4.0% in 2020.

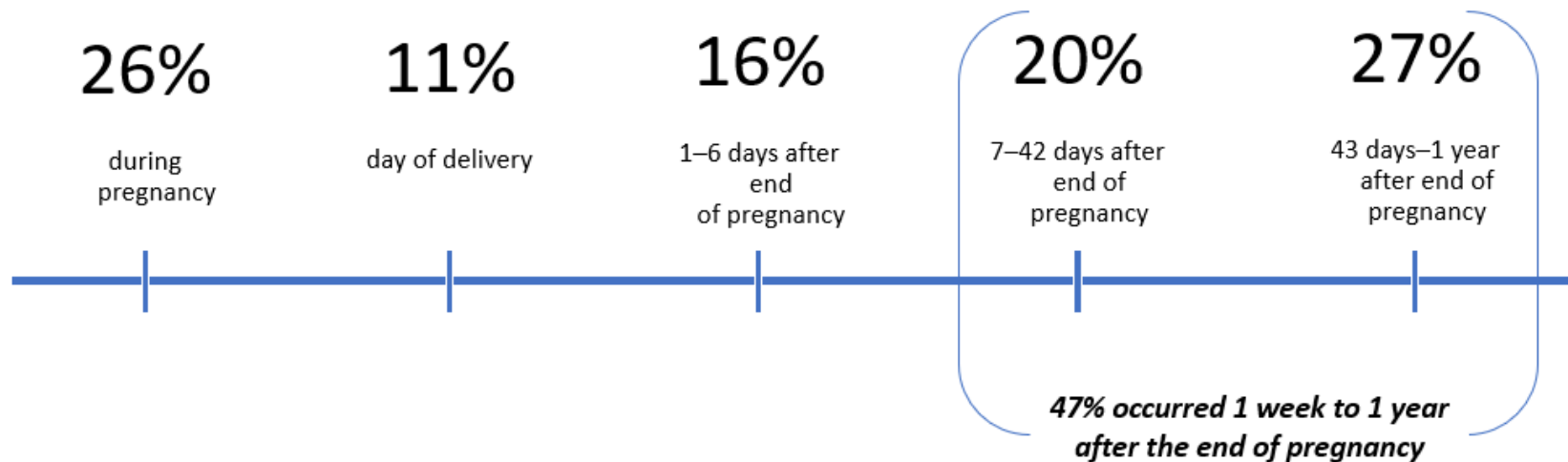
# CDC Division of Reproductive Health Pregnancy-related Mortality Surveillance Programs: PMSS and MMRCs

	Pregnancy Mortality Surveillance System (PMSS)	Jurisdiction-based Maternal Mortality Review Committees (MMRCs)
Data Source	Death records, and death records linked birth or fetal death records, additional information as available	Death records, and death records linked birth or fetal death records, <b>medical records, social service records, autopsy, informant interviews, etc.</b>
Time Frame	During pregnancy – 1 year	During pregnancy – 1 year
Source of Classification	Medical epidemiologists	<b>Multidisciplinary committees</b>
Terms	Pregnancy-associated, (Associated and) Pregnancy-related, (Associated but) Not pregnancy-related	Pregnancy associated, (Associated and) Pregnancy-related, (Associated but) Not pregnancy-related
Measure	Pregnancy-Related Mortality Ratio - # of Pregnancy Related Deaths per 100,000 live births	Pregnancy Related Mortality Ratio - # of Pregnancy Related Deaths per 100,000 live births
Purpose	Analyze clinical factors associated with deaths, publish national information that supports interpretation and uptake of information among clinical & public health practitioners	<b>Understand medical and non-medical contributors to deaths, inform prioritization of interventions that effectively reduce pregnancy-related deaths</b>

# MMRCs in 38 states contributed data on 525 pregnancy-related deaths that occurred in 2020 among their residents



# Maternal Mortality Review Committees in 38 U.S. States, 2020: Timing of pregnancy-related deaths



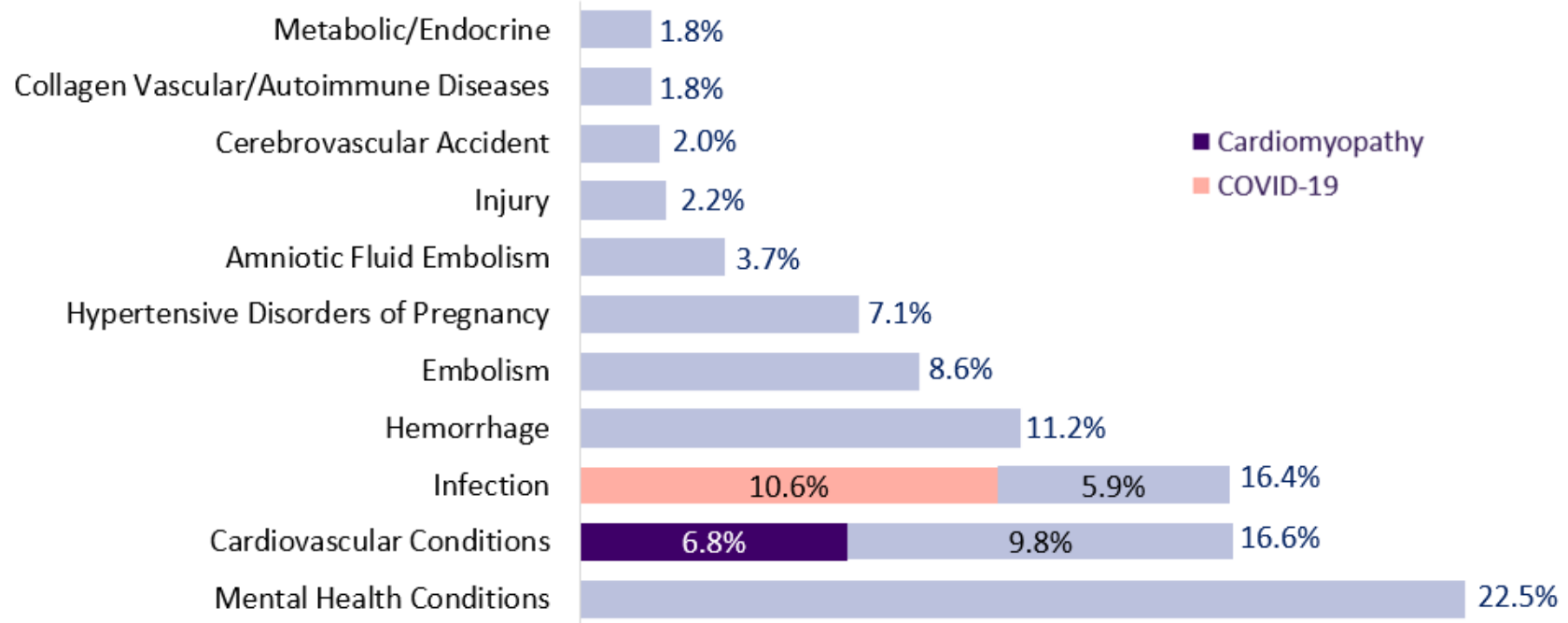


APPENDIX A. PMSS-MM CODES: IF PREGNANCY-RELATED,<sup>2</sup> COMMITTEE DETERMINATION OF UNDERLYING<sup>1</sup> CAUSE OF DEATH

## Underlying Causes of Pregnancy-related Death

<p><b>Hemorrhage (Excludes Aneurysms or CVA)</b>            10.1 - Hemorrhage – Uterine Rupture            10.2 - Placental Abruption            10.3 - Placenta Previa            10.4 - Ruptured Ectopic Pregnancy            10.5 - Hemorrhage – Uterine Atony/Postpartum Hemorrhage            10.6 - Placenta Accreta/Increta/Percreta            10.7 - Hemorrhage due to Retained Placenta            10.10 - Hemorrhage – Laceration/Intra-Abdominal Bleeding            10.9 - Other Hemorrhage/NOS</p> <p><b>Infection</b>            20.1 - Postpartum Genital Tract (e.g., of the Uterus/ Pelvis/Perineum/Necrotizing Fasciitis)            20.2 - Sepsis/Septic Shock            20.4 - Chorioamnionitis/Antepartum Infection            20.6 - Urinary Tract Infection            20.7 - Influenza            20.8 - COVID-19            20.10 - Pneumonia            20.11 - Other Non-Pelvic Infection (e.g., TB, Meningitis, HIV)            20.9 - Other Infection/NOS</p> <p><b>Embolism (Excludes Cerebrovascular)</b>            30.1 - Embolism – Thrombotic            30.9 - Other Embolism (Excludes Amniotic Fluid Embolism)/NOS</p> <p><b>Amniotic Fluid Embolism</b>            31.1 - Amniotic Fluid Embolism</p> <p><b>Hypertensive Disorders of Pregnancy (HDP)</b>            40.1 - Preeclampsia            50.1 - Eclampsia            60.1 - Chronic Hypertension with Superimposed Preeclampsia</p> <p><b>Anesthesia Complications</b>            70.1 - Anesthesia Complications</p> <p><b>Cardiomyopathy</b>            80.1 - Postpartum/Peripartum Cardiomyopathy            80.2 - Hypertrophic Cardiomyopathy            80.9 - Other Cardiomyopathy/NOS</p>	<p><b>Hematologic</b>            82.1 - Sickle Cell Anemia            82.9 - Other Hematologic Conditions including Thrombophilias/TTP/HUS/NOS</p> <p><b>Collagen Vascular/Autoimmune Diseases</b>            83.1 - Systemic Lupus Erythematosus (SLE)            83.9 - Other Collagen Vascular Diseases/NOS</p> <p><b>Conditions Unique to Pregnancy</b>            85.1 - Conditions Unique to Pregnancy (e.g., Gestational Diabetes, Hyperemesis, Liver Disease of Pregnancy)</p> <p><b>Injury</b>            88.1 - Intentional (Homicide)            88.2 - Unintentional            88.9 - Unknown Intent/NOS</p> <p><b>Cancer</b>            89.1 - Gestational Trophoblastic Disease (GTD)            89.3 - Malignant Melanoma            89.9 - Other Malignancies/NOS</p> <p><b>Cardiovascular Conditions (excluding cardiomyopathy, HDP, and CVA)</b>            90.1 - Coronary Artery Disease/Myocardial Infarction (MI)/Atherosclerotic Cardiovascular Disease            90.2 - Pulmonary Hypertension            90.3 - Valvular Heart Disease Congenital and Acquired            90.4 - Vascular Aneurysm/Dissection (Non-Cerebral)            90.5 - Hypertensive Cardiovascular Disease            90.6 - Marfan Syndrome            90.7 - Conduction Defects/Arrhythmias            90.8 - Vascular Malformations Outside Head and Coronary Arteries            90.9 - Other Cardiovascular Disease, including CHF, Cardiomegaly, Cardiac Hypertrophy, Cardiac Fibrosis, Non-Acute Myocarditis/NOS</p> <p><b>Pulmonary Conditions (Excludes ARDS-Adult Respiratory Distress Syndrome)</b>            91.1 - Chronic Lung Disease            91.2 - Cystic Fibrosis            91.3 - Asthma            91.9 - Other Pulmonary Disease/NOS</p>	<p><b>Neurologic/Neurovascular Conditions (Excluding CVA)</b>            92.1 - Epilepsy/Seizure Disorder            92.9 - Other Neurologic Diseases/NOS</p> <p><b>Renal Disease</b>            93.1 - Chronic Renal Failure/End-Stage Renal Disease (ESRD)            93.9 - Other Renal Disease/NOS</p> <p><b>Cerebrovascular Accident (CVA) not Secondary to HDP</b>            95.1 - Cerebrovascular Accident (Hemorrhage/Thrombosis/Aneurysm/Malformation) not Secondary to Hypertensive Disorders of Pregnancy</p> <p><b>Metabolic/Endocrine</b>            96.2 - Diabetes Mellitus            96.9 - Other Metabolic/Endocrine Disorders/NOS</p> <p><b>Gastrointestinal Disorders</b>            97.1 - Crohn's Disease/Ulcerative Colitis            97.2 - Liver Disease/Failure/Transplant            97.9 - Other Gastrointestinal Diseases/NOS</p> <p><b>Mental Health Conditions</b>            100.1 - Depressive Disorder            100.2 - Anxiety Disorder (including Post-Traumatic Stress Disorder)            100.3 - Bipolar Disorder            100.4 - Psychotic Disorder            100.5 - Substance Use Disorder            100.9 - Other Psychiatric Conditions/NOS</p> <p><b>Unknown COD</b>            999.1 - Unknown COD</p>
--	---	---

# Maternal Mortality Review Committees in 38 U.S. States, 2020: Most frequent underlying causes of pregnancy-related deaths (N=511)\*



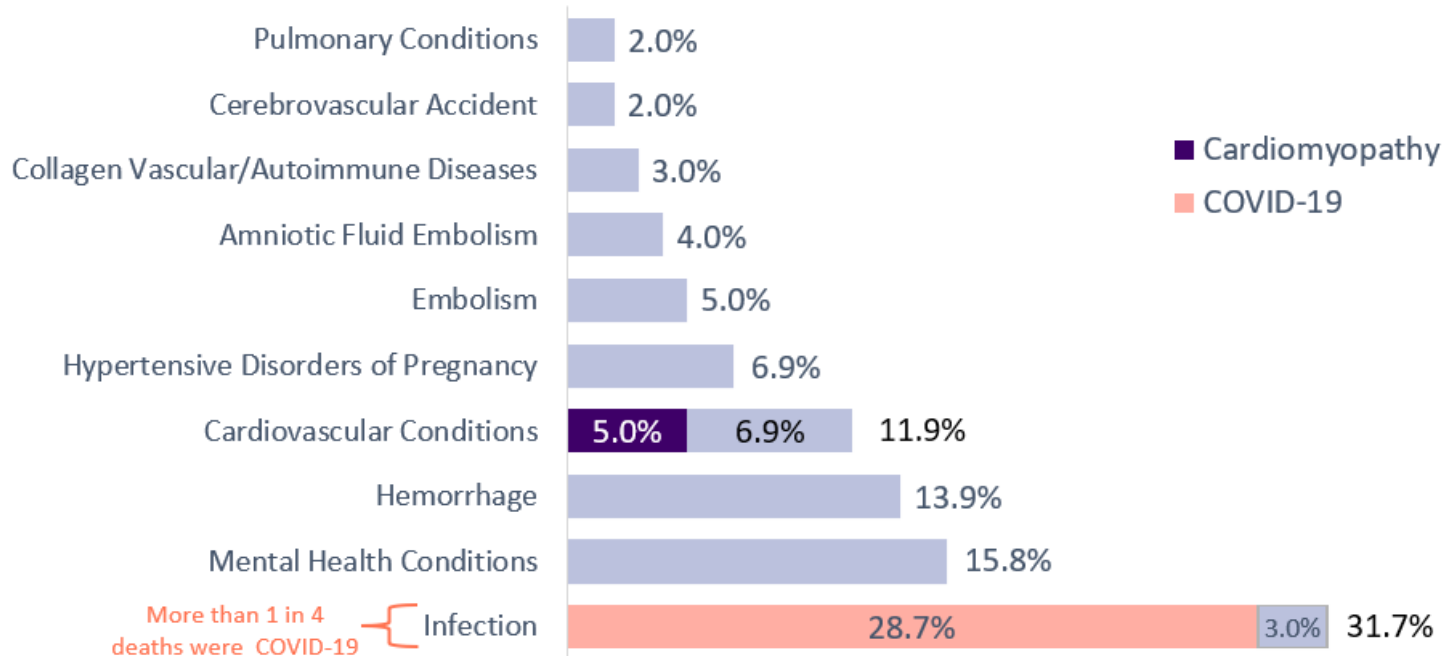
\*Underlying cause of death was missing (n=3) or unknown (n=11) for 14 (2.7%) pregnancy-related deaths

<https://www.cdc.gov/maternal-mortality/php/data-research/index.html>

# Underlying Cause of Death by Race-ethnicity

## Maternal Mortality Review Committees in 38 U.S. States, 2020:

### Most frequent underlying causes of pregnancy-related deaths among Hispanic persons (n=101)\*

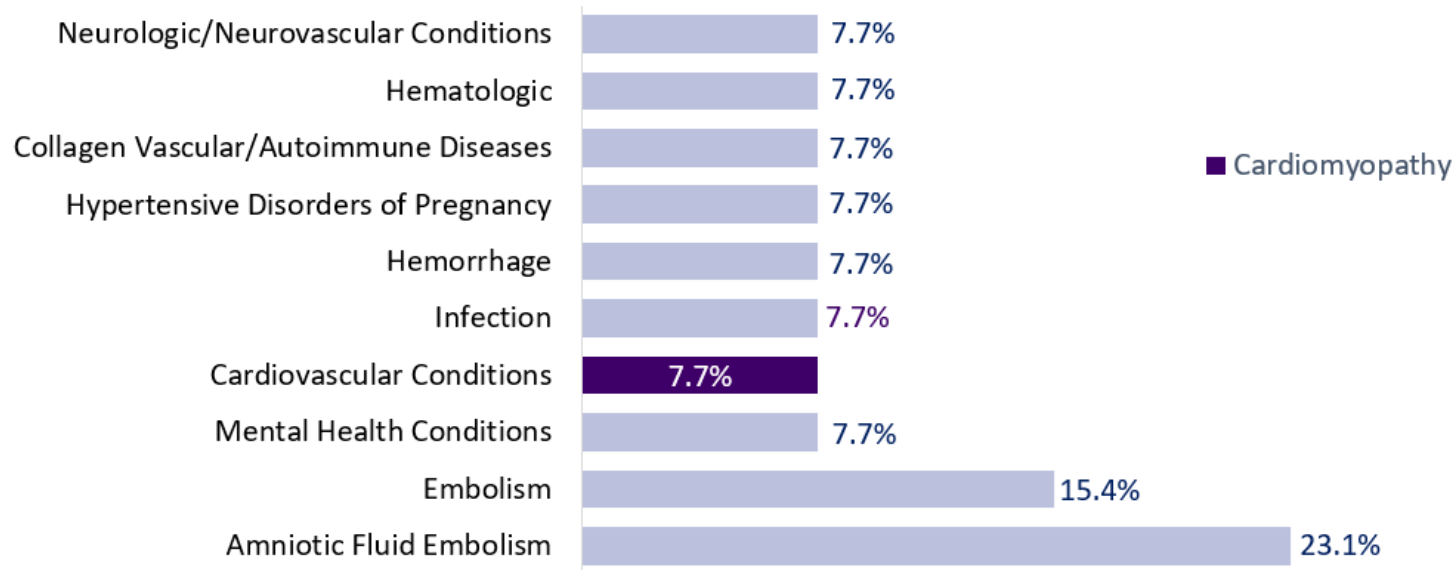


\*Underlying cause of death was unknown for 0 (0.0%) pregnancy-related deaths

<https://www.cdc.gov/maternal-mortality/php/data-research/index.html>

## Maternal Mortality Review Committees in 38 U.S. States, 2020:

### Most frequent underlying causes of pregnancy-related deaths among non-Hispanic Asian persons (n=13)\*

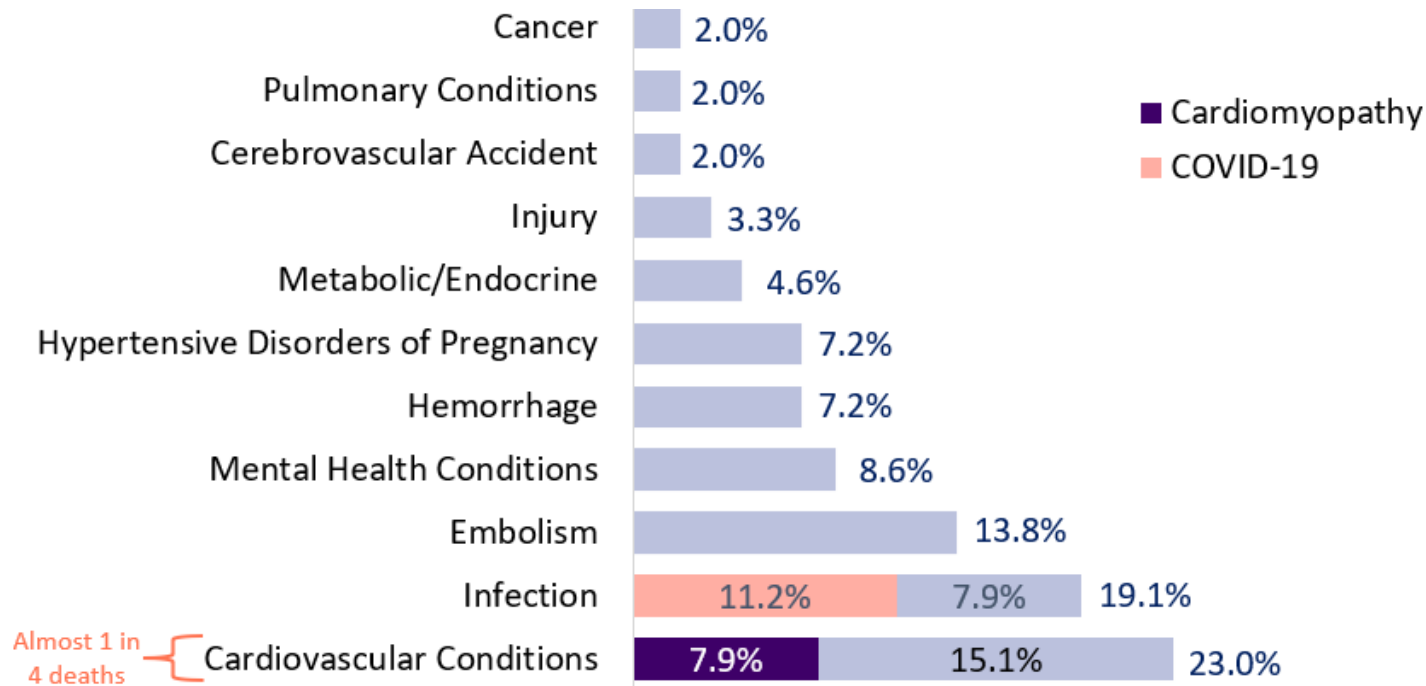


\*Underlying cause was missing (n=1) or unknown (n=1) for a total of 2 (13.3%) pregnancy-related deaths

<https://www.cdc.gov/maternal-mortality/php/data-research/index.html>

## Maternal Mortality Review Committees in 38 U.S. States, 2020:

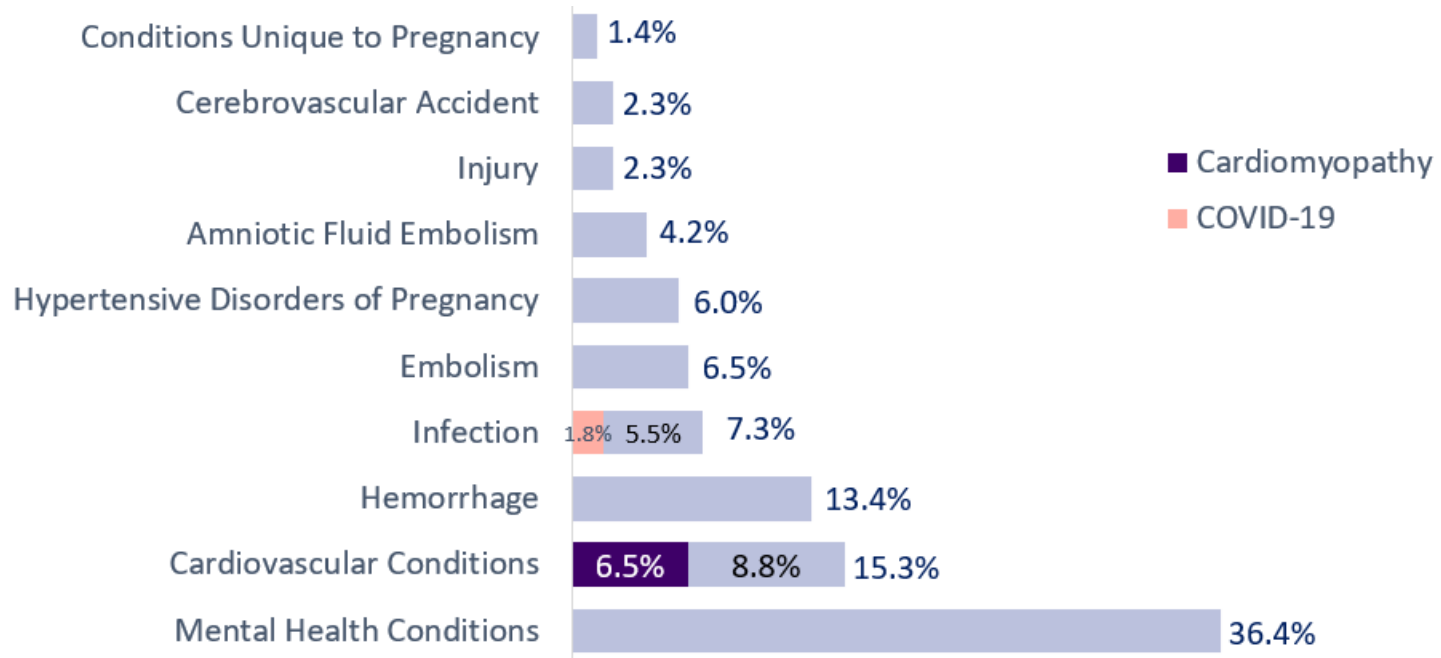
### Most frequent underlying causes of pregnancy-related deaths among non-Hispanic Black persons (n=152)\*



\* Underlying cause of death was unknown for 5 (3.2%) pregnancy-related deaths

<https://www.cdc.gov/maternal-mortality/php/data-research/index.html>

# Maternal Mortality Review Committees in 38 U.S. States, 2020: Most frequent underlying causes of pregnancy-related deaths among non-Hispanic White persons (n=217)\*



\* Underlying cause of death was missing (n=1) or unknown (n=3) for 4 (1.8%) pregnancy-related deaths

<https://www.cdc.gov/maternal-mortality/php/data-research/index.html>

# Circumstances Surrounding A Death

COMMITTEE DETERMINATIONS ON CIRCUMSTANCES SURROUNDING DEATH				
DID <b>OBESITY</b> CONTRIBUTE TO THE DEATH?	<input type="checkbox"/> YES	<input type="checkbox"/> PROBABLY	<input type="checkbox"/> NO	<input type="checkbox"/> UNKNOWN
DID <b>DISCRIMINATION</b> <sup>5</sup> CONTRIBUTE TO THE DEATH?	<input type="checkbox"/> YES	<input type="checkbox"/> PROBABLY	<input type="checkbox"/> NO	<input type="checkbox"/> UNKNOWN
DID <b>MENTAL HEALTH CONDITIONS</b> OTHER THAN SUBSTANCE USE DISORDER CONTRIBUTE TO THE DEATH?	<input type="checkbox"/> YES	<input type="checkbox"/> PROBABLY	<input type="checkbox"/> NO	<input type="checkbox"/> UNKNOWN
DID <b>SUBSTANCE USE DISORDER</b> CONTRIBUTE TO THE DEATH?	<input type="checkbox"/> YES	<input type="checkbox"/> PROBABLY	<input type="checkbox"/> NO	<input type="checkbox"/> UNKNOWN

These circumstances are defined as whether obesity/substance use disorder/mental health condition/discrimination contributed to the death, and not just whether the circumstance was present.



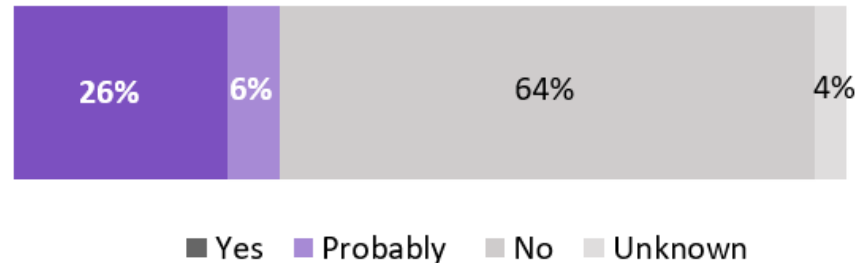
# Maternal Mortality Review Committees in 38 U.S. States, 2020: Committee determinations on circumstances surrounding death, *obesity*

- **MMRCs** determine whether obesity contributed to the death, and not just whether the person was obese.
- The committee may determine that 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.*

- Obesity was a circumstance in **32%** of deaths.

Committee determination on circumstances surrounding death: Did obesity contribute to the death?



This determination was missing for 3 (0.6%) pregnancy-related deaths  
<https://www.cdc.gov/maternal-mortality/php/report/index.html>

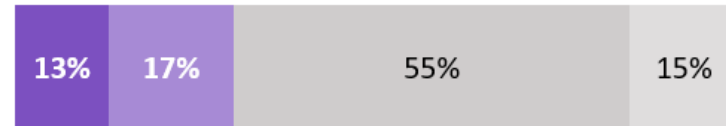
# Maternal Mortality Review Committees in 38 U.S. States, 2020: Committee determinations on circumstances surrounding death, *discrimination*

- **MMRCs** determine whether discrimination contributed to the death, and not just whether the individual was exposed to discrimination
- Discrimination is 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.<sup>1</sup>

*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.*

- Discrimination was a circumstance in **30%** of deaths.

Committee determination on circumstances surrounding death: Did discrimination contribute to the death?



■ Yes ■ Probably ■ No ■ Unknown

This determination was missing for 2 (0.4%) pregnancy-related deaths  
<https://www.cdc.gov/maternal-mortality/php/report/index.html>

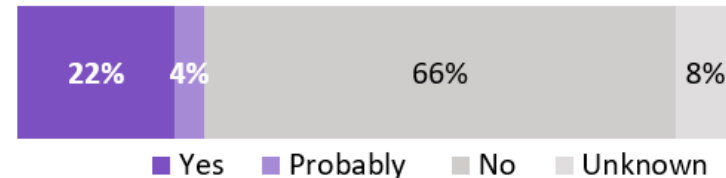
<sup>1</sup> Hardeman RR, et al. Developing Tools to Report Racism in Maternal Health for the CDC Maternal Mortality Review Information Application (MMRIA): Findings from the MMRIA Racism & Discrimination Working Group. *Matern Child Health J.* 2022 Apr;26(4):661-669.

## Maternal Mortality Review Committees in 38 U.S. States, 2020:

### Committee determinations on circumstances surrounding death, *mental health conditions other than substance use disorder*

- **MMRCs** determine whether a mental health condition other than substance use disorder contributed to the death, and not just whether the person had a mental health condition.
- Mental health conditions are present when the individual had a documented diagnosis of a psychiatric disorder (includes depressive, anxiety, psychotic, and bipolar disorders).
- The committee may determine that a mental health condition is a circumstance that contributed to the death when the condition directly compromised an individual's health or health care.  
*For example, when a mental health condition, such as severe depression, impacted their ability to manage type II diabetes*
- Mental health conditions was a circumstance in **26%** of deaths.

Committee determination on circumstances surrounding death: Did mental health conditions other than substance use disorder contribute?



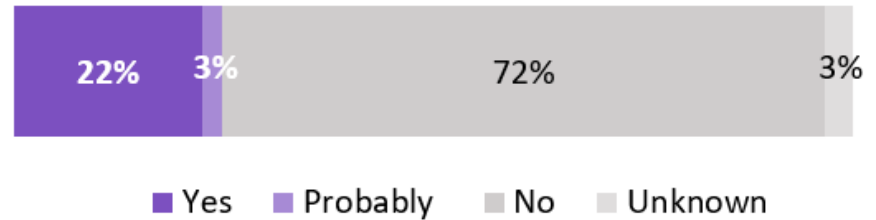
This determination was missing for 2 (0.4%) pregnancy-related deaths  
<https://www.cdc.gov/maternal-mortality/php/report/index.html>

## Maternal Mortality Review Committees in 38 U.S. States, 2020:

### Committee determinations on circumstances surrounding death, *substance use disorder*

- **MMRCs** determine whether substance use disorder contributed to the death, and not just whether the individual had a substance use disorder.
- The committee may determine that 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.*
- Substance use disorder was a circumstance in about **25%** of deaths.

Committee determination on circumstances surrounding death: Did substance use disorder (SUD) contribute to the death?



**84%** of pregnancy-related deaths with an MMRC preventability determination were determined to be **preventable**

A preventability determination was missing (n=1) or unable to determine (n=9) for 10 (1.9%) pregnancy-related deaths.  
<https://www.cdc.gov/maternal-mortality/php/report/index.html>

**Pregnancy-Related Deaths Among  
American Indian or Alaska Native Persons:  
Data From Maternal Mortality Review  
Committees in 38 States, 2020**

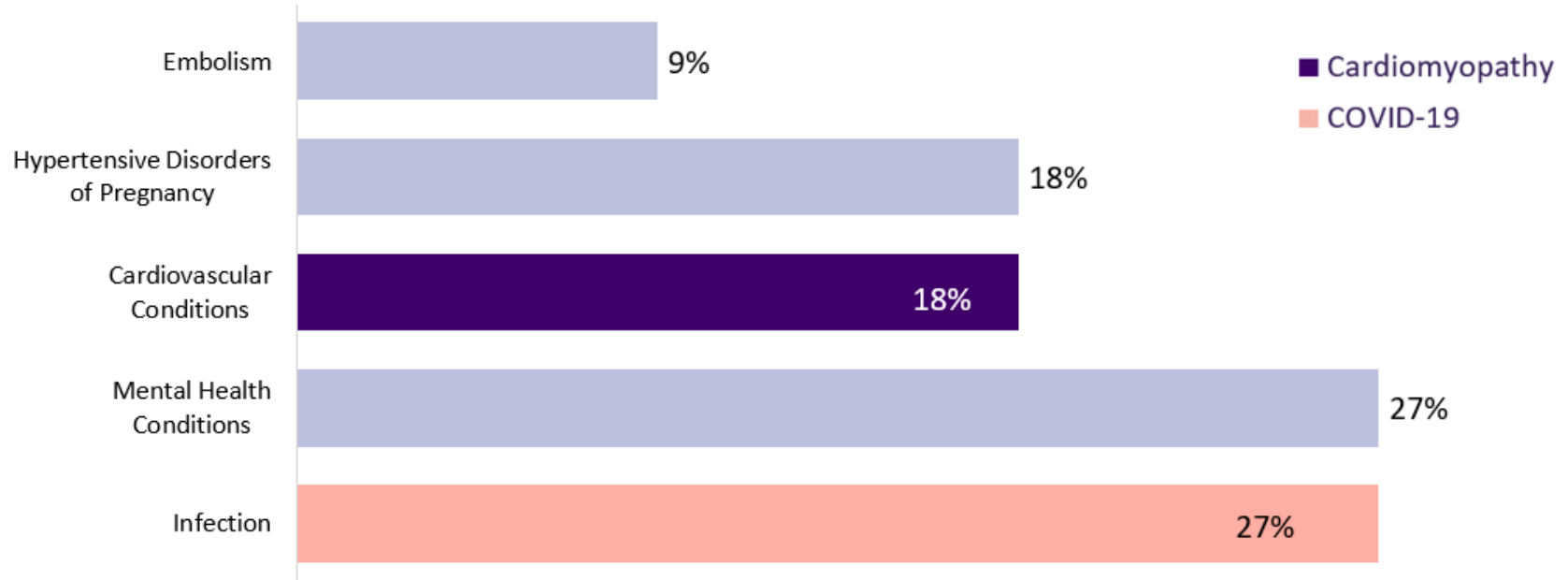
## Maternal Mortality Review Committees in 38 U.S. States, 2020:

### Summary of an alternative approach to classifying pregnancy-related deaths among American Indian or Alaska Native persons



## Maternal Mortality Review Committees in 38 U.S. States, 2020:

### Most frequent underlying causes of pregnancy-related deaths among American Indian or Alaska Native persons (n=11)\*



\*Underlying cause of death was unknown for 1 (8.3%) pregnancy-related death among American Indian or Alaska Native persons  
<https://www.cdc.gov/maternal-mortality/php/data-research/2020-mmrc-aian.html>



**92%** of pregnancy-related deaths with an MMRC preventability determination were determined to be **preventable**

# Thank you.

## Questions?

[PMSS@cdc.gov](mailto:PMSS@cdc.gov)

[MMRIA@cdc.gov](mailto:MMRIA@cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention.