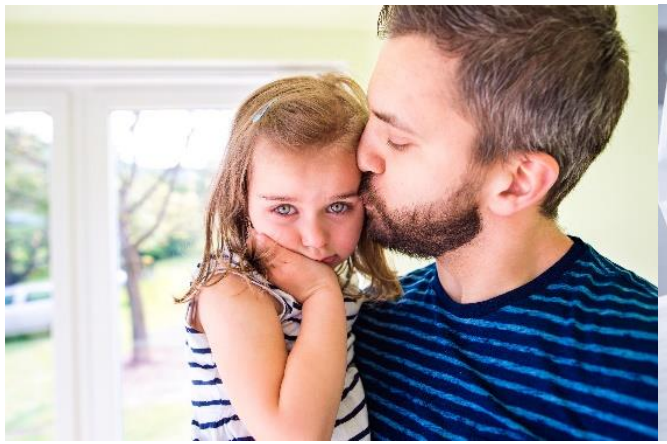
Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM)




MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

ERASE MM Enhancing Reviews and Surveillance to Eliminate Maternal Mortality

REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

Disclosure

- I have no potential conflicts of interest to disclose

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

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

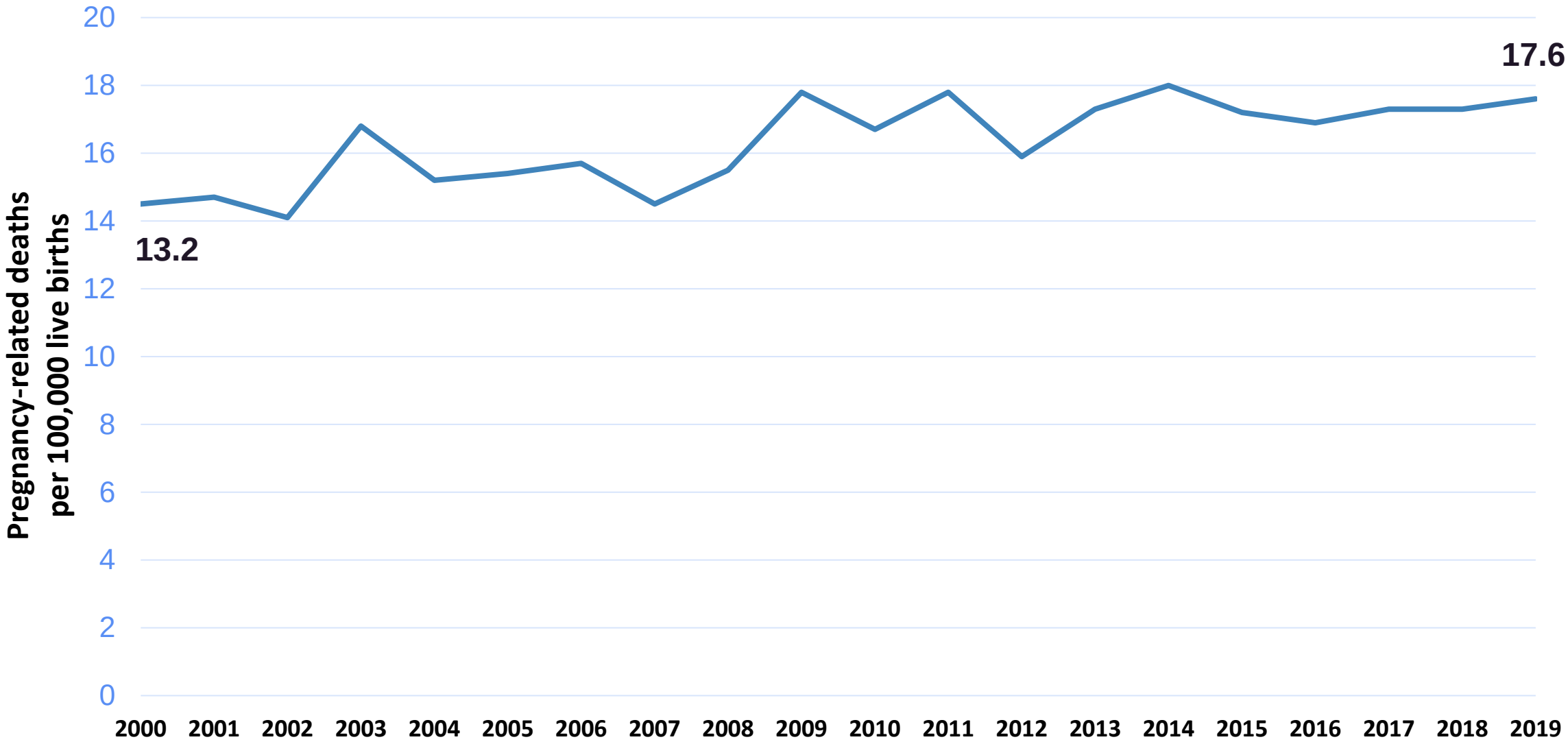
	Pregnancy Mortality Surveillance System (PMSS)
Data Source	Death records, and death records linked birth or fetal death records, additional information as available
Time Frame	During pregnancy – 1 year
Source of Classification	Medical epidemiologists
Terms	Pregnancy-associated, (Associated and) Pregnancy-related, (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

Adapted from: St. Pierre A, Zaharatos J, Goodman D, Callaghan WM. Challenges and opportunities in identifying, reviewing, and preventing maternal deaths. *Obstet Gynecol*. 2018;131(1):138–142.

Pregnancy Mortality Surveillance System

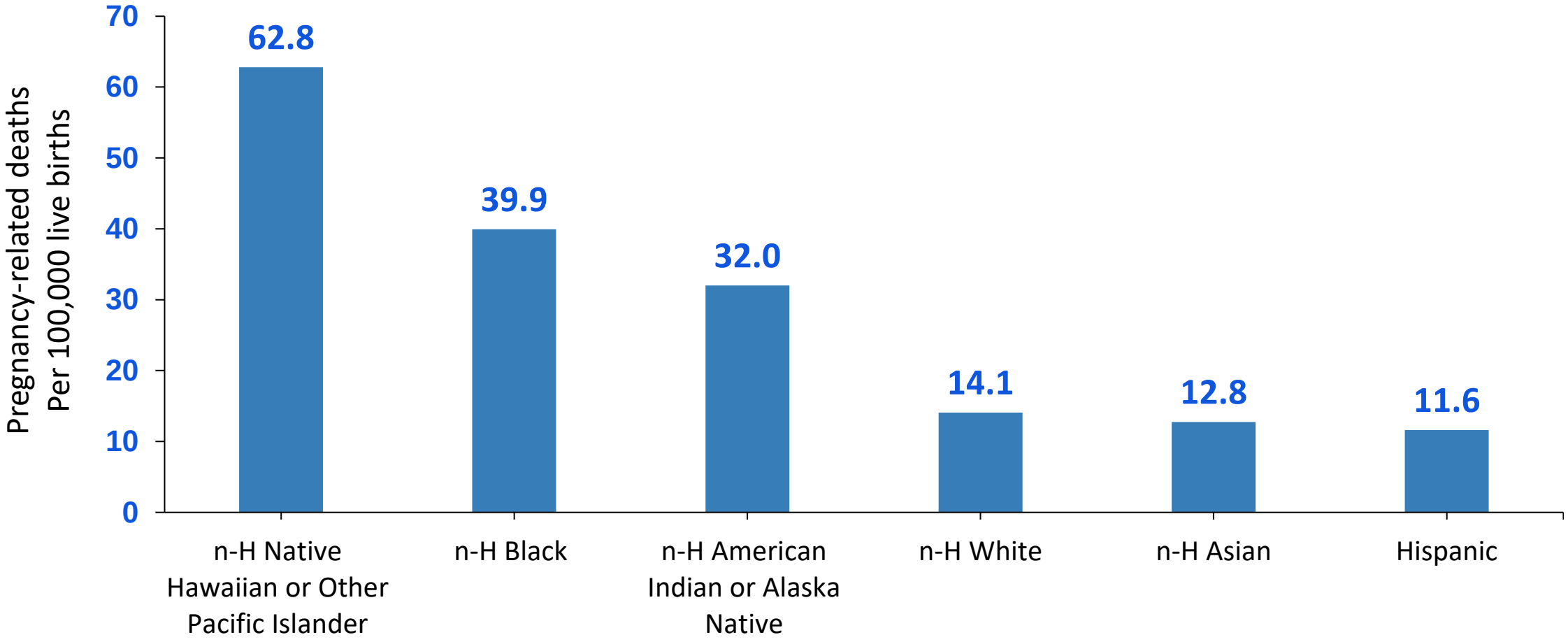
2017-2019 Data Update

Pregnancy-related Mortality Ratio by Year: 2000-2019, PMSS*



*CDC Pregnancy Mortality Surveillance System. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm

Pregnancy-related Mortality Ratio by Race-ethnicity: 2017-2019, PMSS*

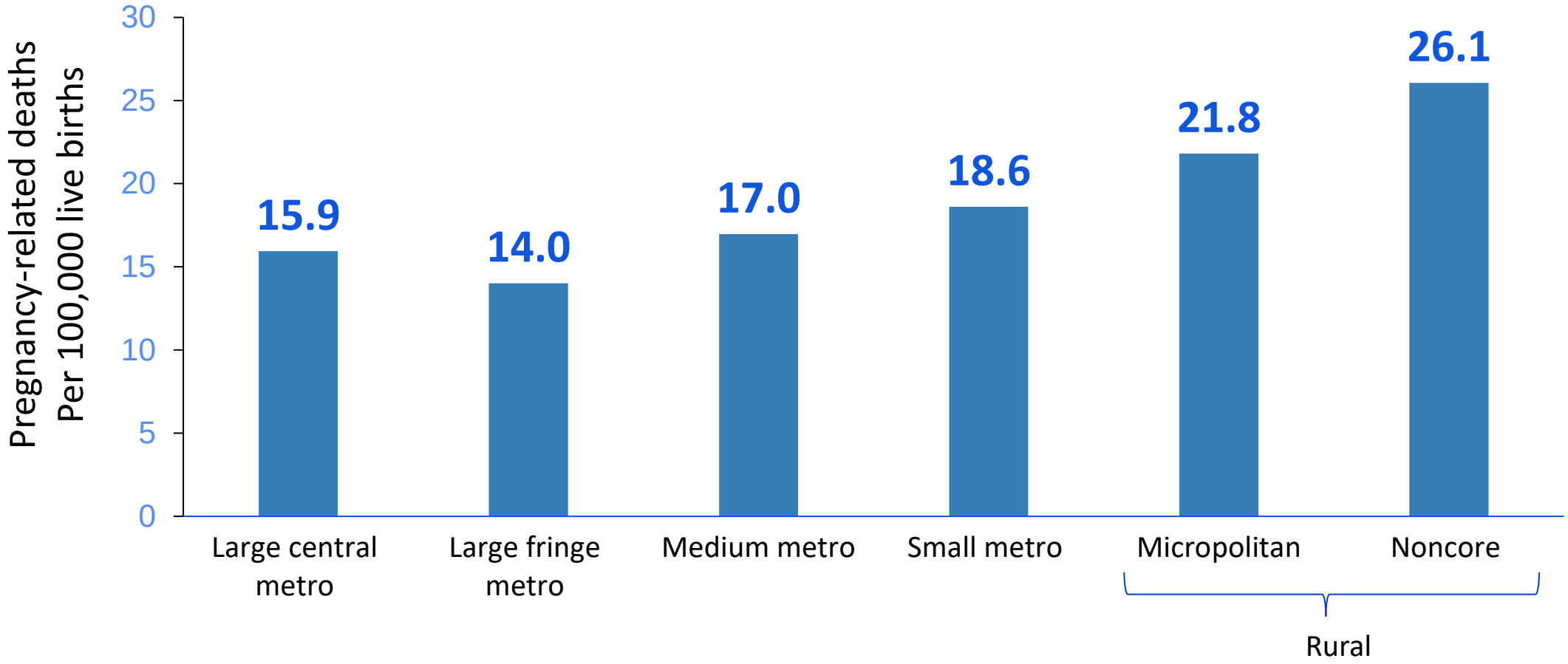


Multiracial PRMR for 2018-2019 = 7.1 pregnancy0related deaths per 100,000 live births.

Race or ethnicity was missing for 1.4% of pregnancy-related deaths in 2017-2019; PRMRs for non-Hispanic Other Race were not calculated due to small numbers.

*CDC Pregnancy Mortality Surveillance System. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm

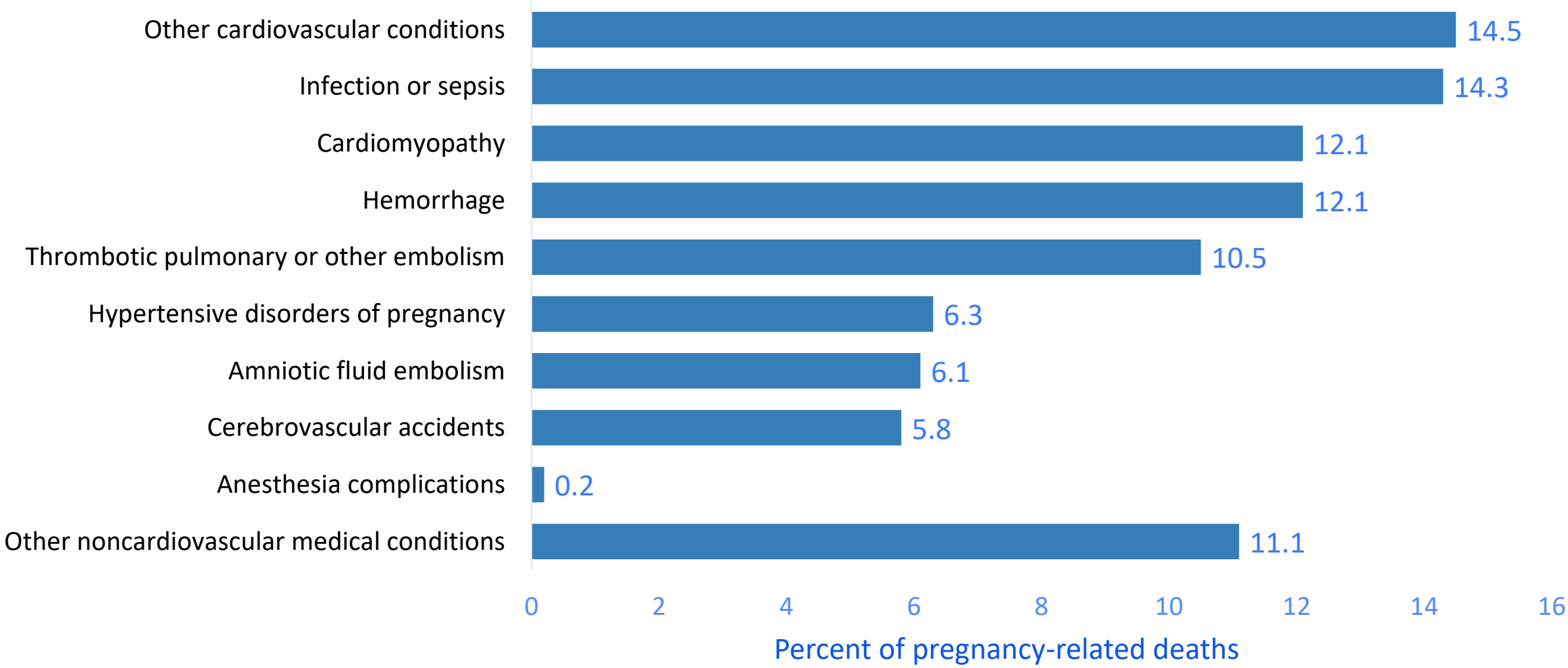
Pregnancy-related Mortality Ratio by Urban-Rural Classification: 2017-2019, PMSS*



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

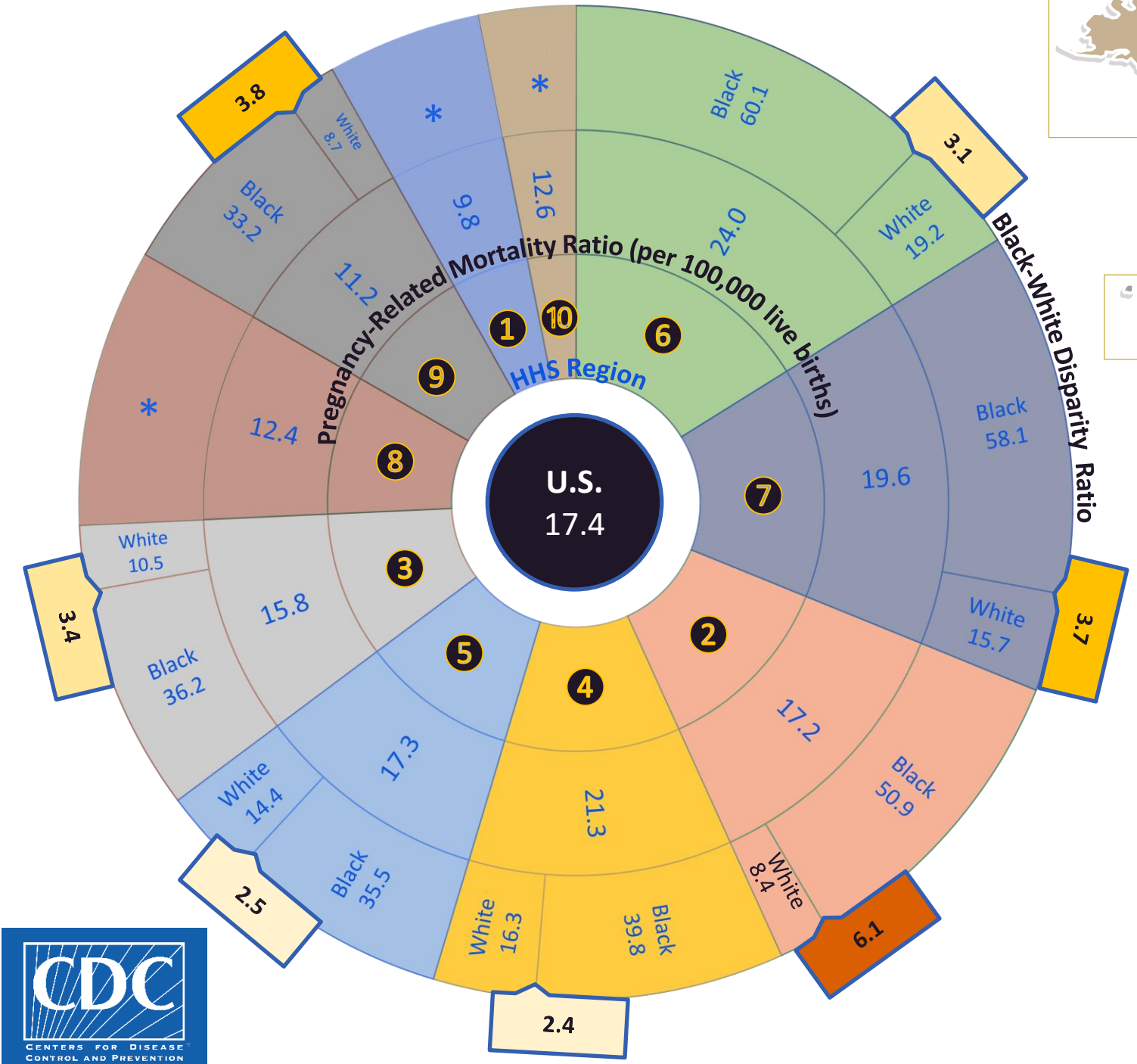
*CDC Pregnancy Mortality Surveillance System. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm

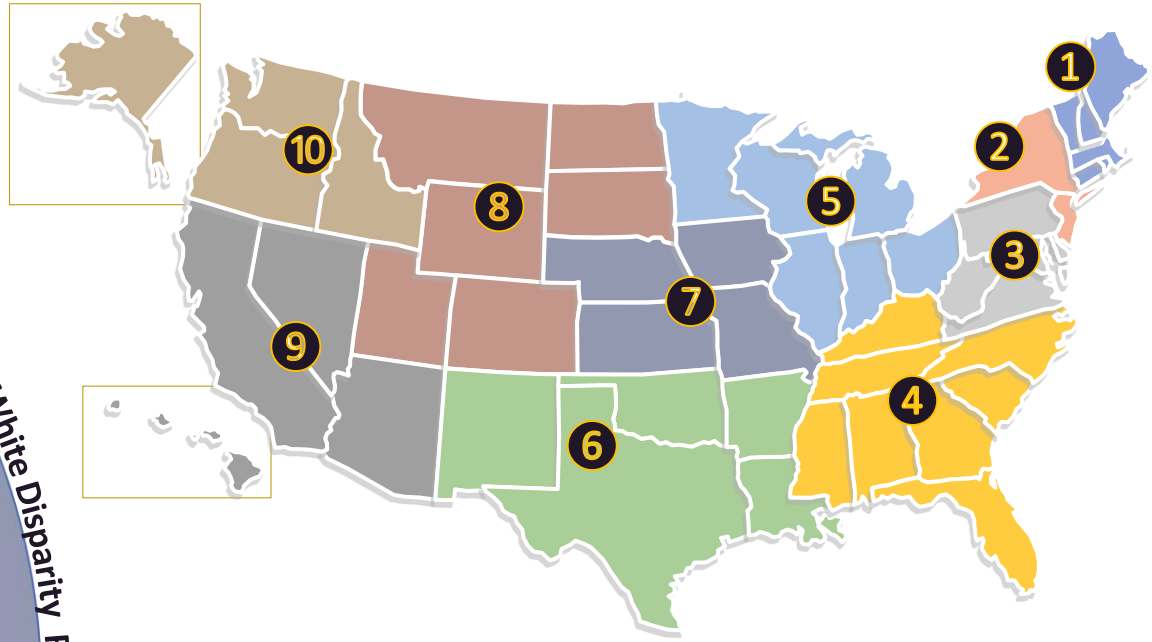
Distribution of Causes of Pregnancy-related Death: 2017-2019, PMSS*



Cause of death was unknown for 7.0% of pregnancy-related deaths in 2017-2019; Injury-related deaths are not included due to insufficient information to determine pregnancy-relatedness.

*CDC Pregnancy Mortality Surveillance System. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm





Pregnancy Related Mortality Ratio by
U.S. Dept of Health & Human Services Region
Black-White Disparity Ratio

CDC Pregnancy Mortality Surveillance System
2014-2016

*Race specific ratios and disparity ratio suppressed because at least one numerator count was <8.

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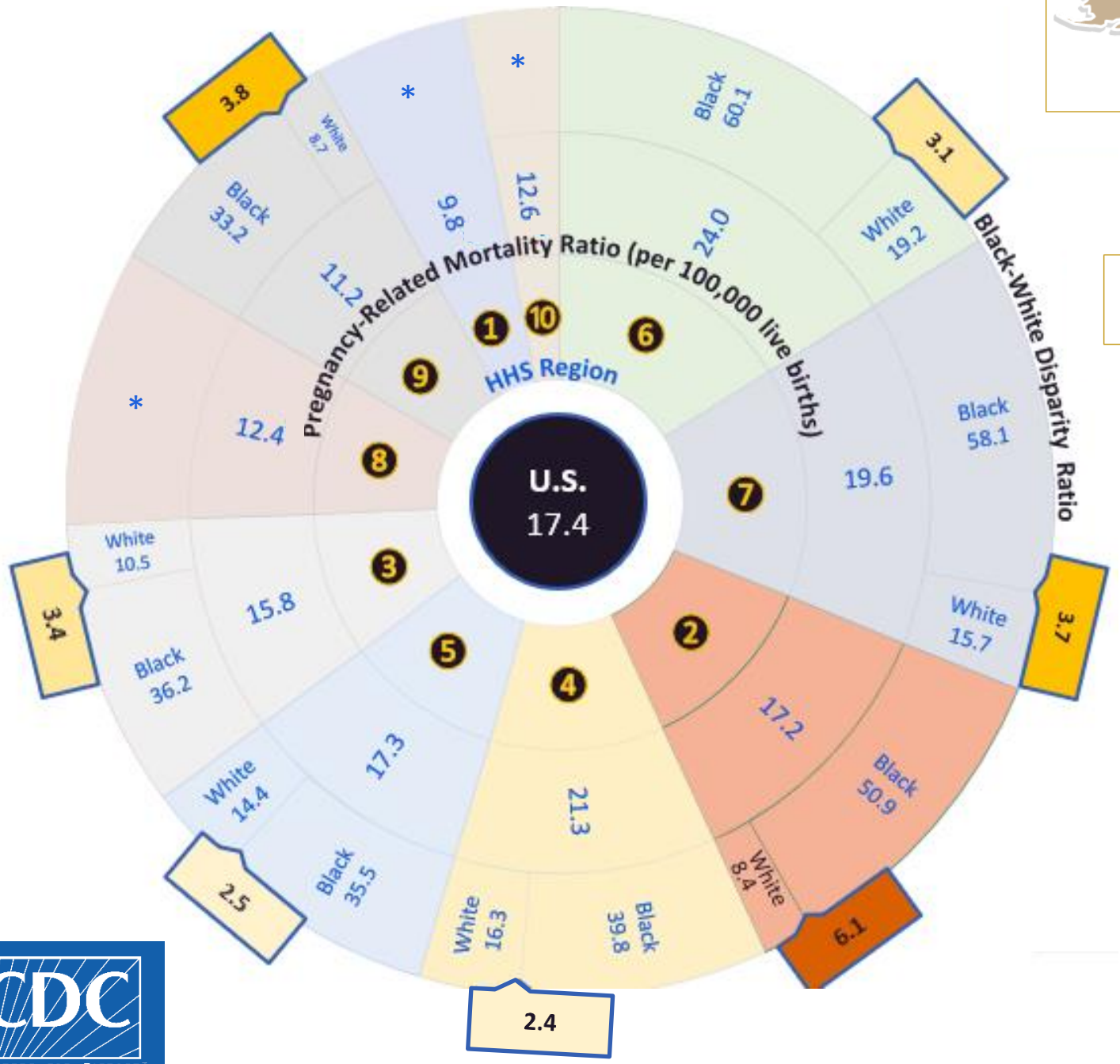

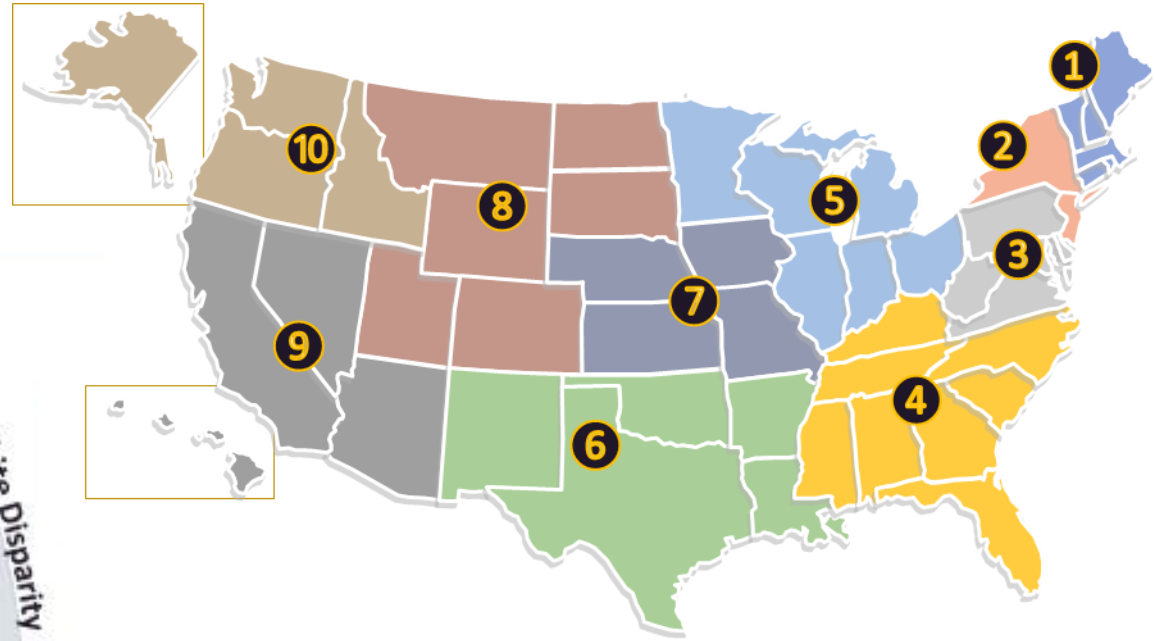

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U.S. Dept of Health & Human Services Region
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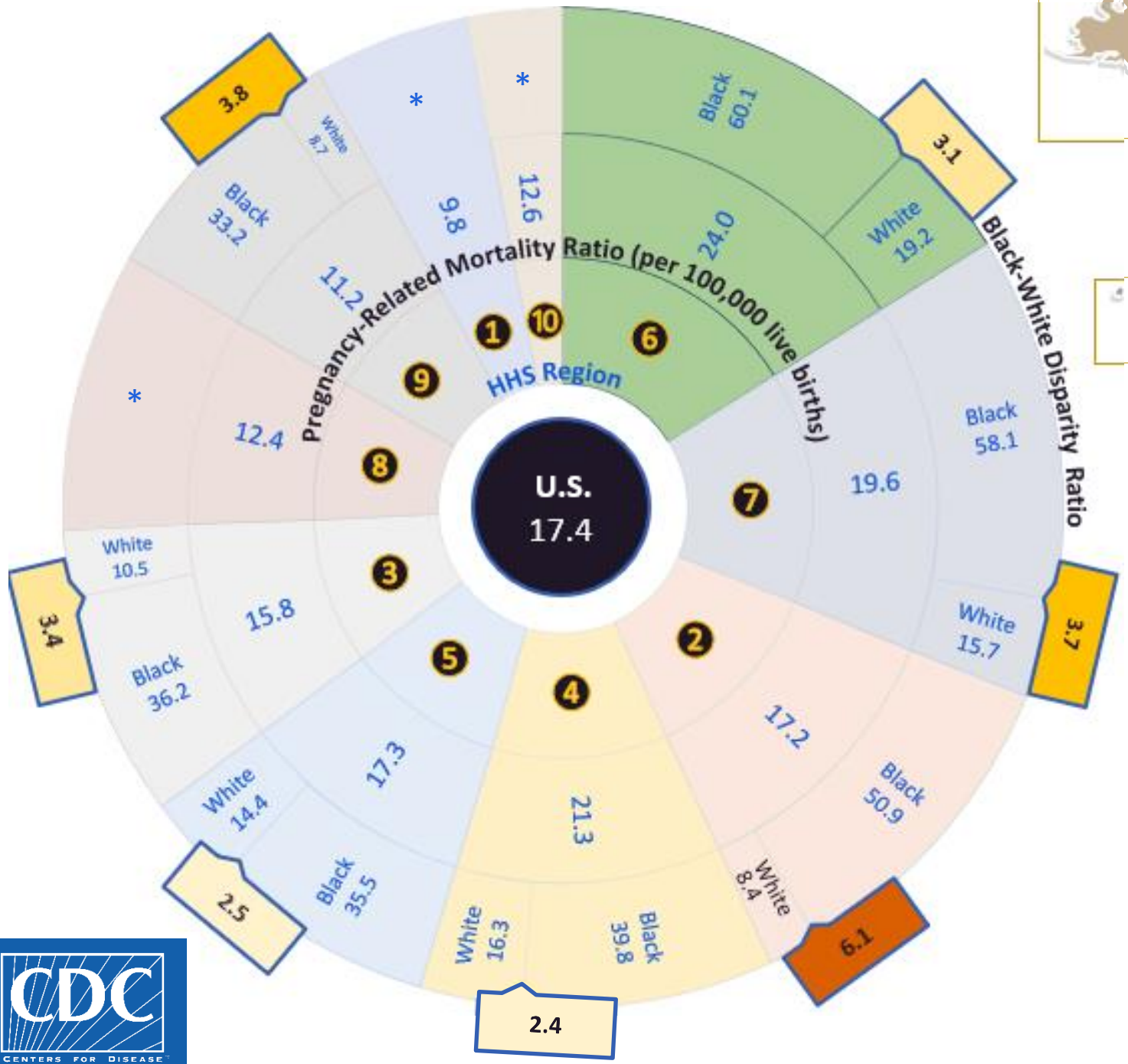
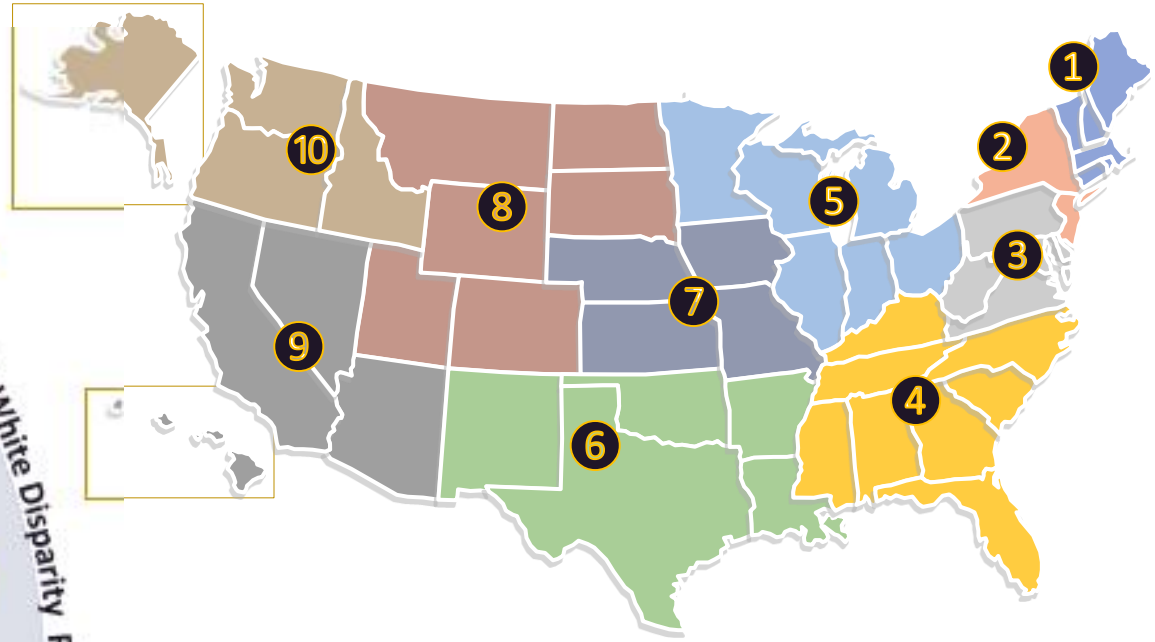
CDC
Centers for Disease Control and Prevention





Pregnancy Related Mortality Ratio by
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Black-White Disparity Ratio

CDC Pregnancy Mortality Surveillance System
2014-2016

*Race specific ratios and disparity ratio suppressed because at least one numerator count was <8.

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What were the circumstances surrounding the death and how can we prevent deaths like this in the future?

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

	Pregnancy Mortality Surveillance System (PMSS)	State and Local 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**, medical records, social service records, autopsy, informant interviews, etc**.
Time Frame	During pregnancy – 1 year	During pregnancy – 1 year
Source of Classification	Medical epidemiologists	**Multidisciplinary committees**
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.	**Understand medical and non-medical contributors to deaths, inform prioritization of interventions that effectively reduce pregnancy-related deaths**

Maternal Mortality Review

Is

An ongoing anonymous and confidential process of data collection, analysis, interpretation, and action

A systematic process guided by policies, statutes, rules, etc.

Intended to move from data collection to prevention activities

Is not

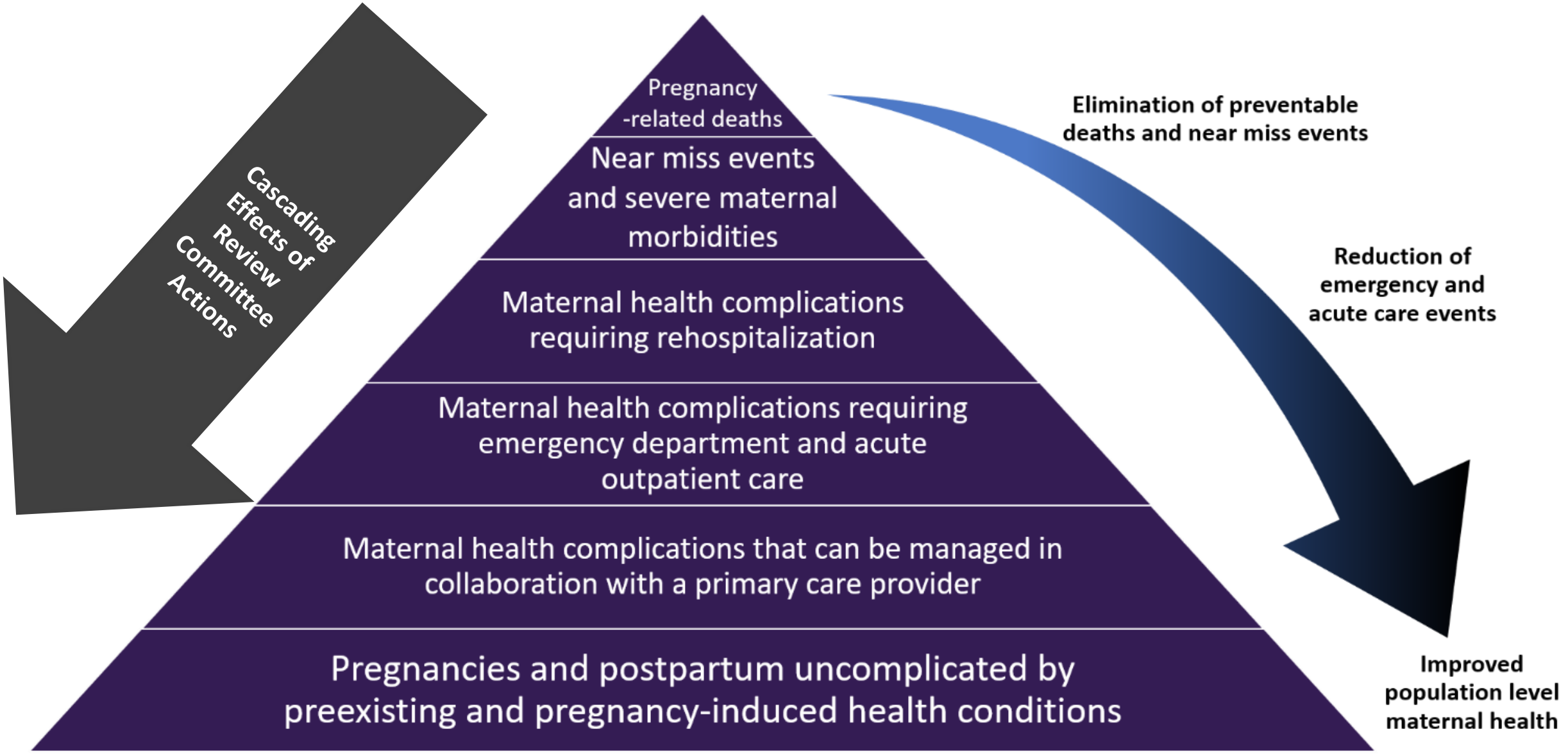
A mechanism for assigning blame or responsibility for any death

A research study

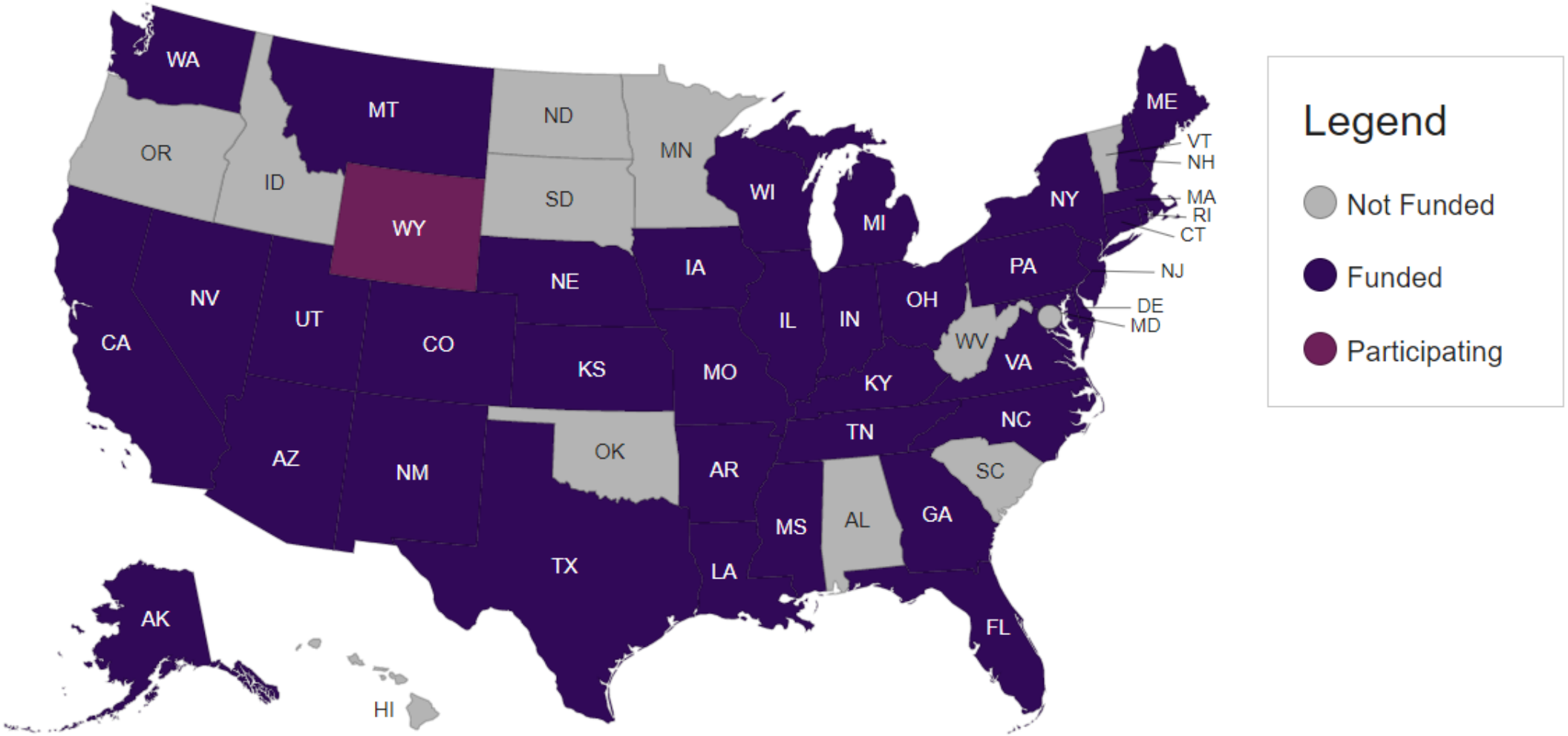
Peer review / Institutional review

A substitute for existing mortality and morbidity inquiries

Data that Fuels Action



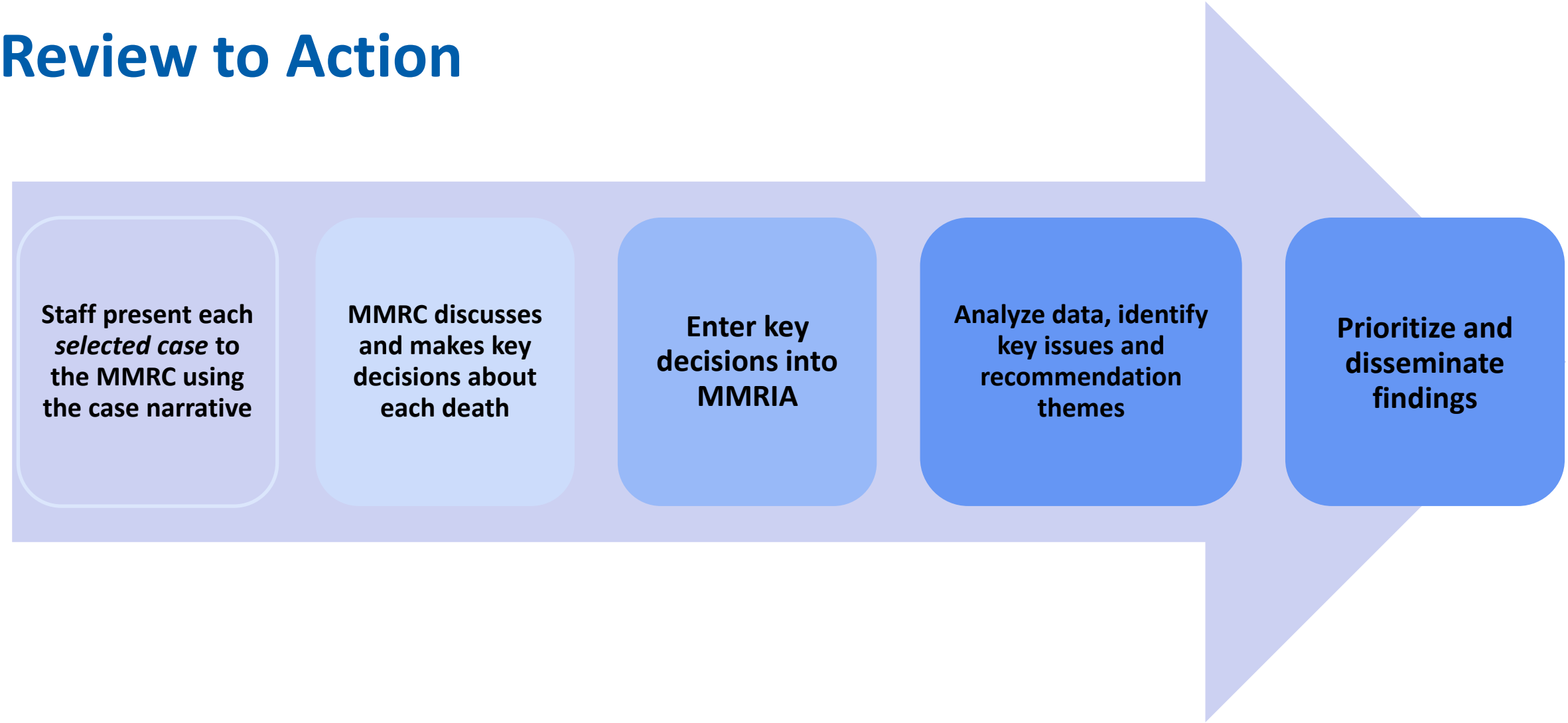
States and US Territories Funded Through ERASE MM



Territories AS GU PR VI MP

www.cdc.gov/erasemm

Review to Action



Adapted from WA State DOH

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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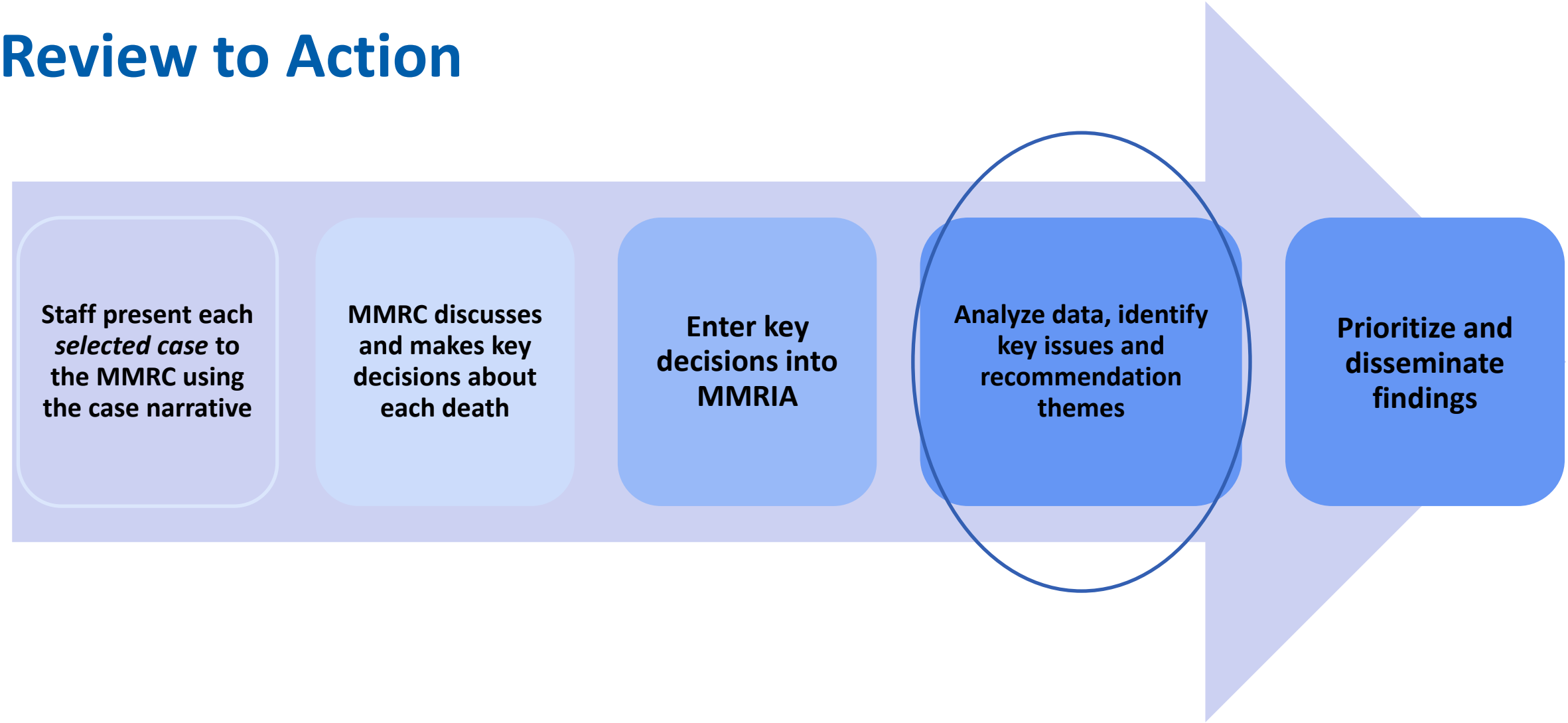
REVIEW to ACTION

Review to Action



Adapted from WA State DOH

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP
ERASE MM
REVIEW to ACTION

Underlying Cause of Death, Manner of Death, and Circumstances Surrounding a Death

Underlying Cause of Death	Manner of Death	Circumstances Surrounding A Death
▪ MMRC identified* ▪ Disease or injury that initiated the chain of events leading to death ▪ Uses coding that includes 69 specific causes of pregnancy-related death	▪ MMRC identified* ▪ Describes the way in which a death occurs ▪ Documented by MMRCs for 2 types of deaths — Suicide — Homicide	▪ MMRC identified ▪ Used to identify 4 specific issues that can both be present and complicate the chain of events leading to death — Obesity — Discrimination — Mental Health Condition other than substance use disorder — Substance use disorder
	Documented by MMRCs as: Yes, Probably, No, Unknown	

* Determined by the MMRC, after review of information across all sources, independent of the underlying cause of death or manner of death that is documented on the death certificate. The ways MMRCs capture underlying cause of death codes, manner of death, and circumstances surrounding a death are available at: https://reviewtoaction.org/sites/default/files/2022-12/mmria-form-v22-fillable_Dec11.pdf

Underlying Causes of Pregnancy-related Death

Hemorrhage (Excludes Aneurysms or CVA)
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

Infection
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

Embolism - Thrombotic (Non-Cerebral)
30.1 - Embolism – Thrombotic (Non-Cerebral)
30.9 - Other Embolism (Excludes Amniotic Fluid Embolism)/NOS

Amniotic Fluid Embolism
31.1 - Embolism - Amniotic Fluid

Hypertensive Disorders of Pregnancy (HDP)
40.1 - Preeclampsia
50.1 - Eclampsia
60.1 - Chronic Hypertension with Superimposed Preeclampsia

Anesthesia Complications
70.1 - Anesthesia Complications

Cardiomyopathy
80.1 - Postpartum/Peripartum Cardiomyopathy
80.2 - Hypertrophic Cardiomyopathy
80.9 - Other Cardiomyopathy/NOS

Hematologic
82.1 - Sickle Cell Anemia
82.9 - Other Hematologic Conditions including Thrombophilias/TTP/HUS/NOS

Collagen Vascular/Autoimmune Diseases
83.1 - Systemic Lupus Erythematosus (SLE)
83.9 - Other Collagen Vascular Diseases/NOS

Conditions Unique to Pregnancy
85.1 - Conditions Unique to Pregnancy (e.g, Gestational Diabetes, Hyperemesis, Liver Disease of Pregnancy)

Injury
88.1 - Intentional (Homicide)
88.2 - Unintentional
88.9 - Unknown Intent/NOS

Cancer
89.1 - Gestational Trophoblastic Disease (GTD)
89.3 - Malignant Melanoma
89.9 - Other Malignancies/NOS

Cardiovascular Conditions (excluding cardiomyopathy, HDP, and CVA)
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

Pulmonary Conditions (Excludes ARDS-Adult Respiratory Distress Syndrome)
91.1 - Chronic Lung Disease
91.2 - Cystic Fibrosis
91.3 - Asthma
91.9 - Other Pulmonary Disease/NOS

Neurologic/Neurovascular Conditions (Excluding CVA)
92.1 - Epilepsy/Seizure Disorder
92.9 - Other Neurologic Diseases/NOS

Renal Disease
93.1 - Chronic Renal Failure/End-Stage Renal Disease (ESRD)
93.9 - Other Renal Disease/NOS

Cerebrovascular Accident (CVA) not Secondary to HDP
95.1 - Cerebrovascular Accident (Hemorrhage/Thrombosis/Aneurysm/Malformation) not Secondary to Hypertensive Disorders of Pregnancy

Metabolic/Endocrine
96.2 - Diabetes Mellitus
96.9 - Other Metabolic/Endocrine Disorders/NOS

Gastrointestinal Disorders
97.1 - Crohn's Disease/Ulcerative Colitis
97.2 - Liver Disease/Failure/Transplant
97.9 - Other Gastrointestinal Diseases/NOS

Mental Health Conditions
100.1 - Depressie 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

Unknown COD
999.1 - Unknown COD

Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017-2019

www.cdc.gov/erasemm

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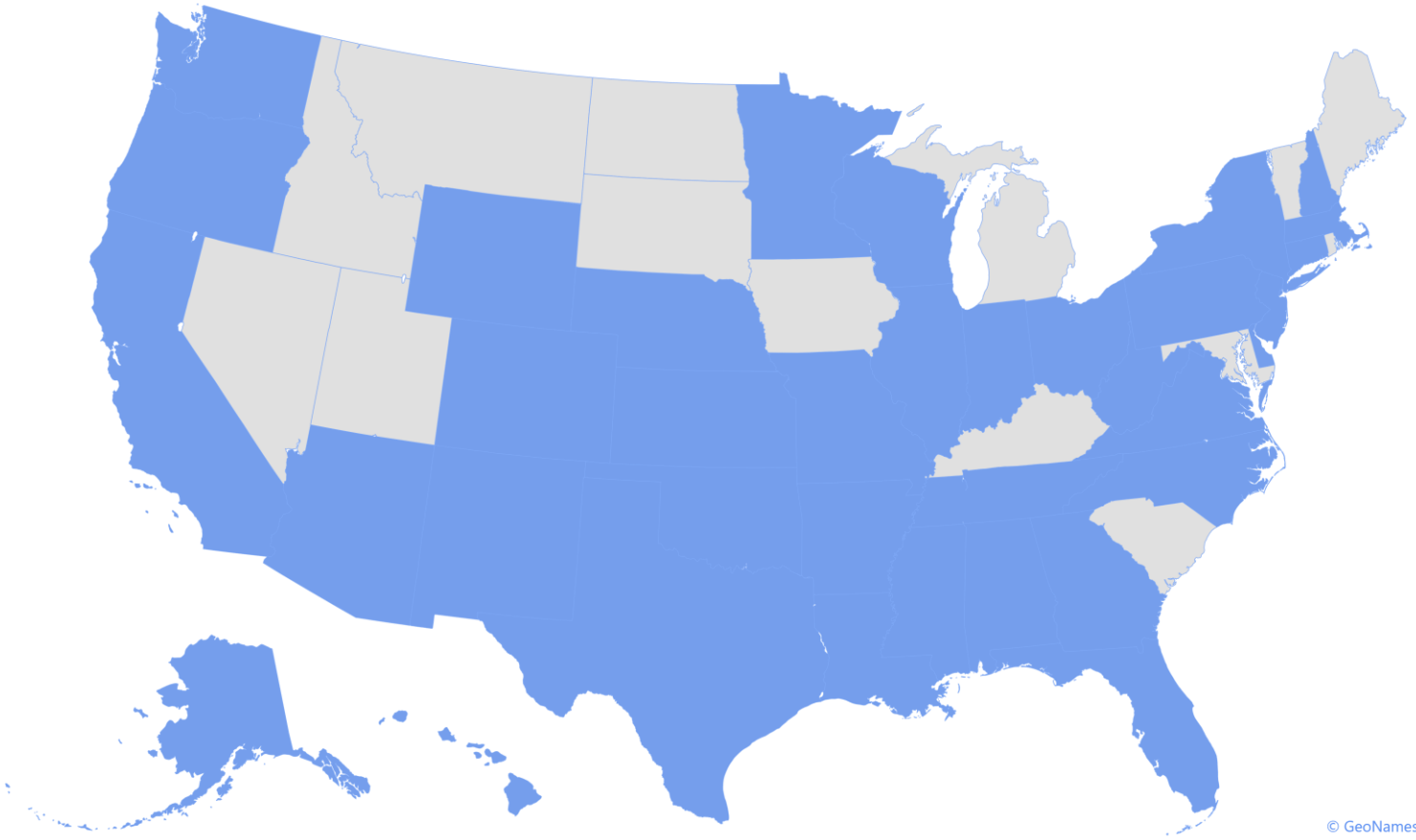
ERASE MM Enhancing Reviews and Surveillance to Eliminate Maternal Mortality

REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019

MMRCs in 36 States Contributed Data on 1,018 Pregnancy-related Deaths Among Their Residents

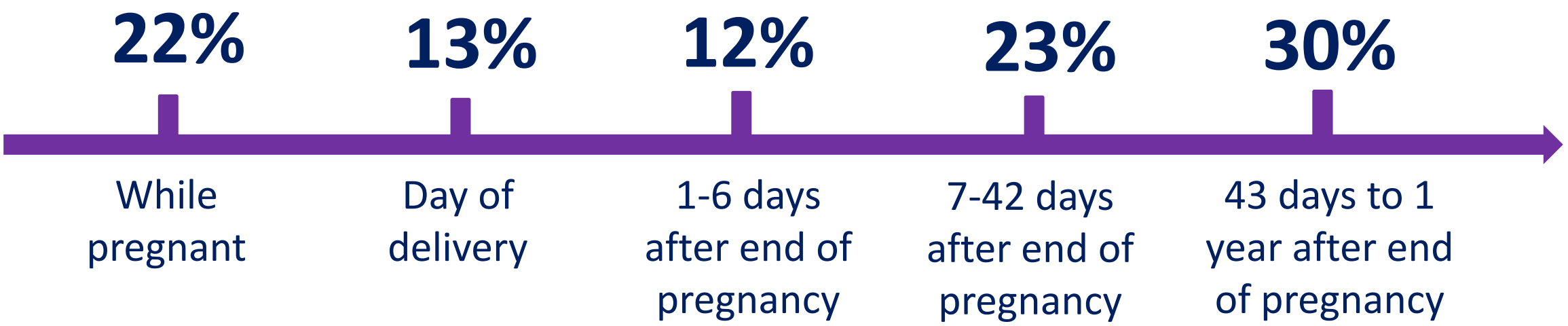


MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

ERASE MM

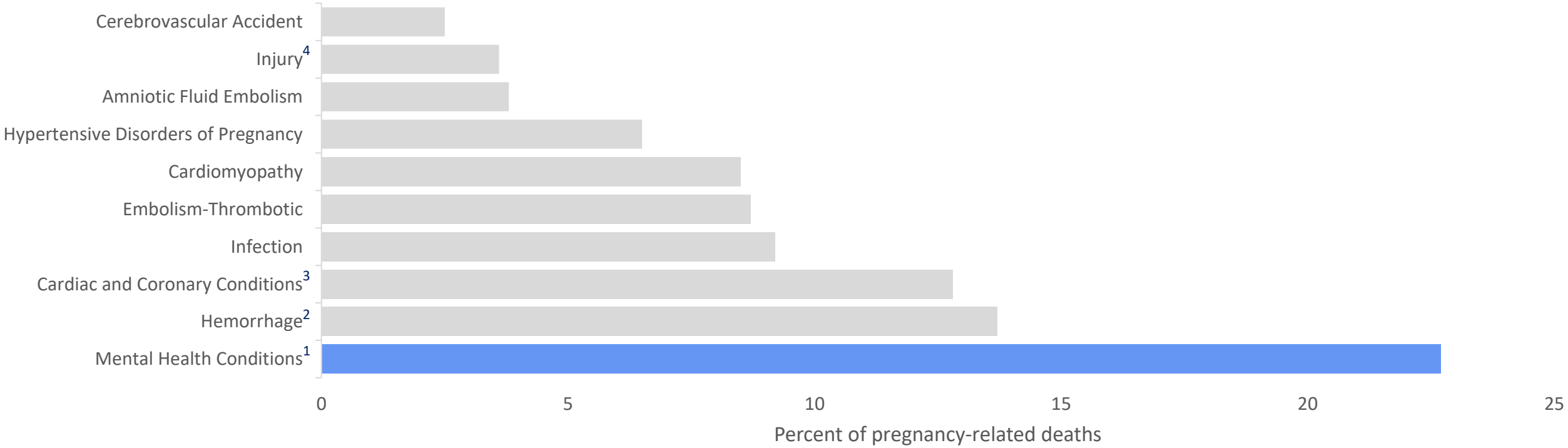
REVIEW to ACTION

Timing of Pregnancy-related Deaths



Timing was missing (n=2) or unknown (n=14) for 16 (1.6%) pregnancy-related deaths.

Most Frequent Underlying Causes of Pregnancy-related Deaths*



[1] Mental health conditions include deaths to suicide, unintentional or unknown intent overdose/poisoning related to substance use disorder, and other deaths determined by the MMRC to be related to a mental health condition, including substance use disorder

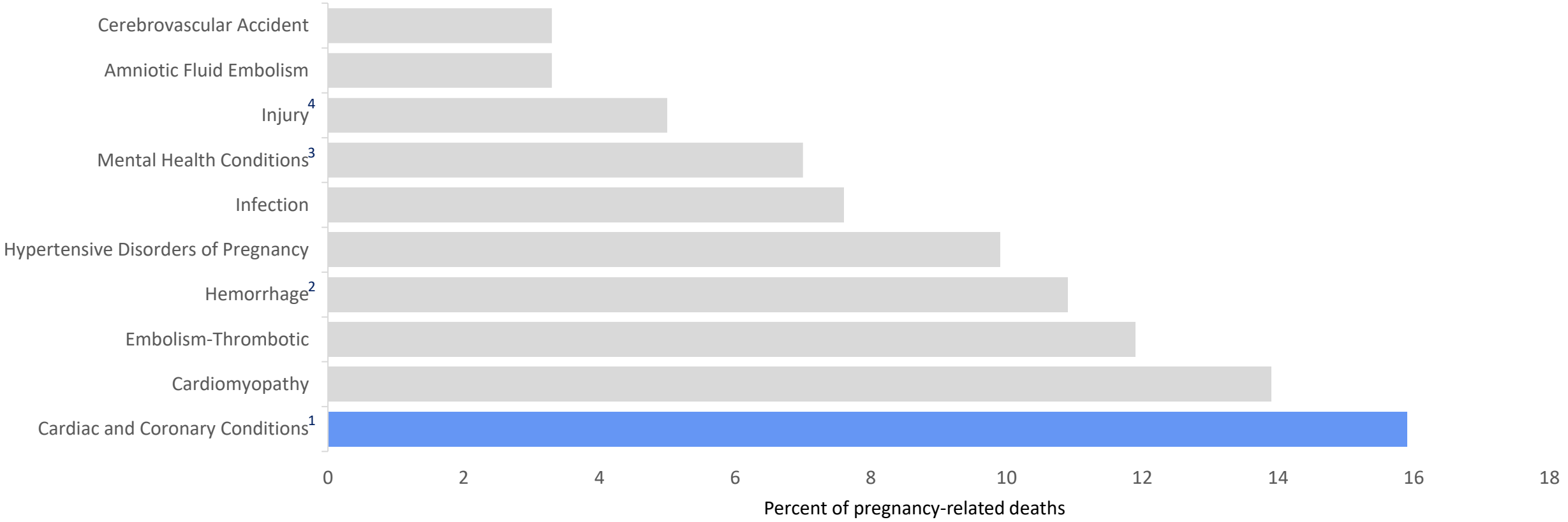
[2] Excludes aneurysms or cerebrovascular accident (CVA)

[3] Cardiac and coronary conditions include deaths to coronary artery disease, pulmonary hypertension, acquired and congenital valvular heart disease, vascular aneurysm, hypertensive cardiovascular disease, Marfan Syndrome, conduction defects, vascular malformations, and other cardiovascular disease; and excludes cardiomyopathy and hypertensive disorders of pregnancy.

[4] Injury includes intentional injury (homicide), unintentional injury, including overdose/poisoning deaths not related to substance use disorder, and injury of unknown intent or not otherwise specified.

*Only 10 most frequent underlying causes of death are shown; underlying cause of death was missing (n=10) or unknown (n=21) for 31 (3.0%) pregnancy-related deaths

Most Frequent Underlying Causes of Pregnancy-related Deaths Among non-Hispanic Black Persons*



[1] Cardiac and coronary conditions include deaths to coronary artery disease, pulmonary hypertension, acquired and congenital valvular heart disease, vascular aneurysm, hypertensive cardiovascular disease, Marfan Syndrome, conduction defects, vascular malformations, and other cardiovascular disease; and excludes cardiomyopathy and hypertensive disorders of pregnancy.

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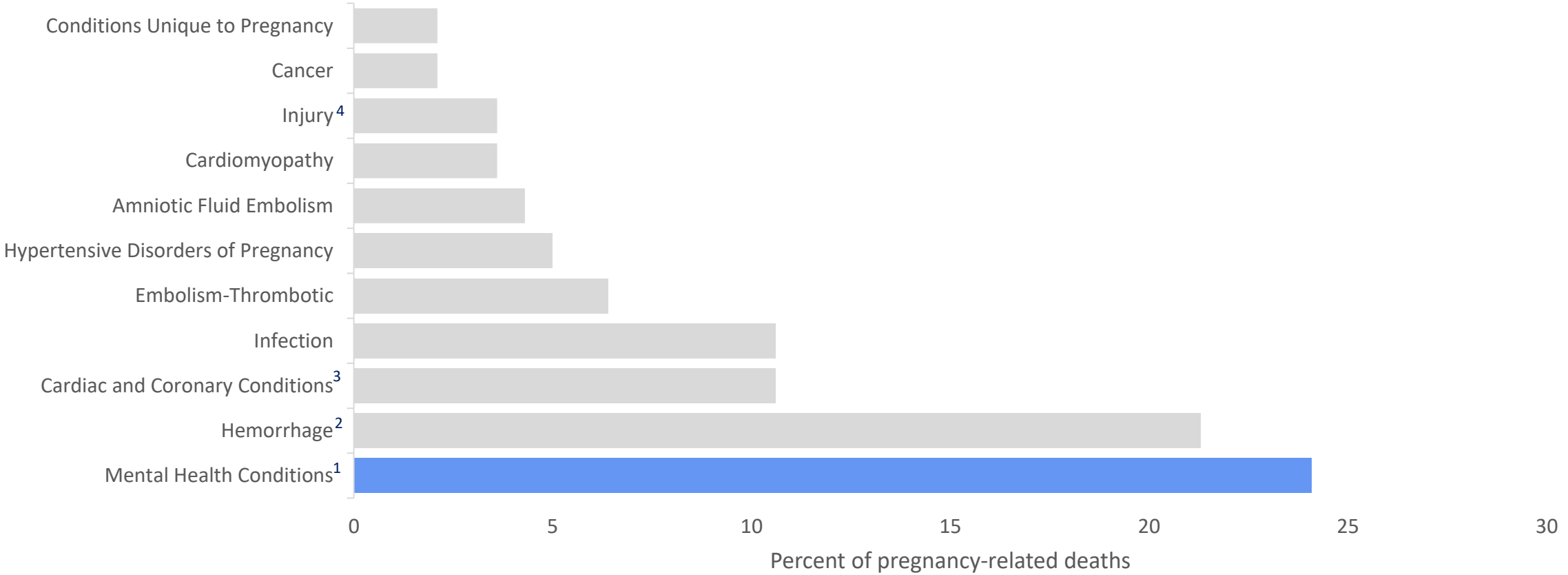
[4] Injury includes intentional injury (homicide), unintentional injury, including overdose/poisoning deaths not related to substance use disorder, and injury of unknown intent or not otherwise specified.

*Only 10 most frequent underlying causes of death are shown; underlying cause of death was missing (n=6) or unknown (n=7) for 13 (4.1%) pregnancy-related deaths

Most Frequent Underlying Causes of Pregnancy-related Deaths Among Hispanic Persons*



[1] Mental health conditions include deaths to suicide, unintentional or unknown intent overdose/poisoning related to substance use disorder, and other deaths determined by the MMRC to be related to a mental health condition, including substance use disorder

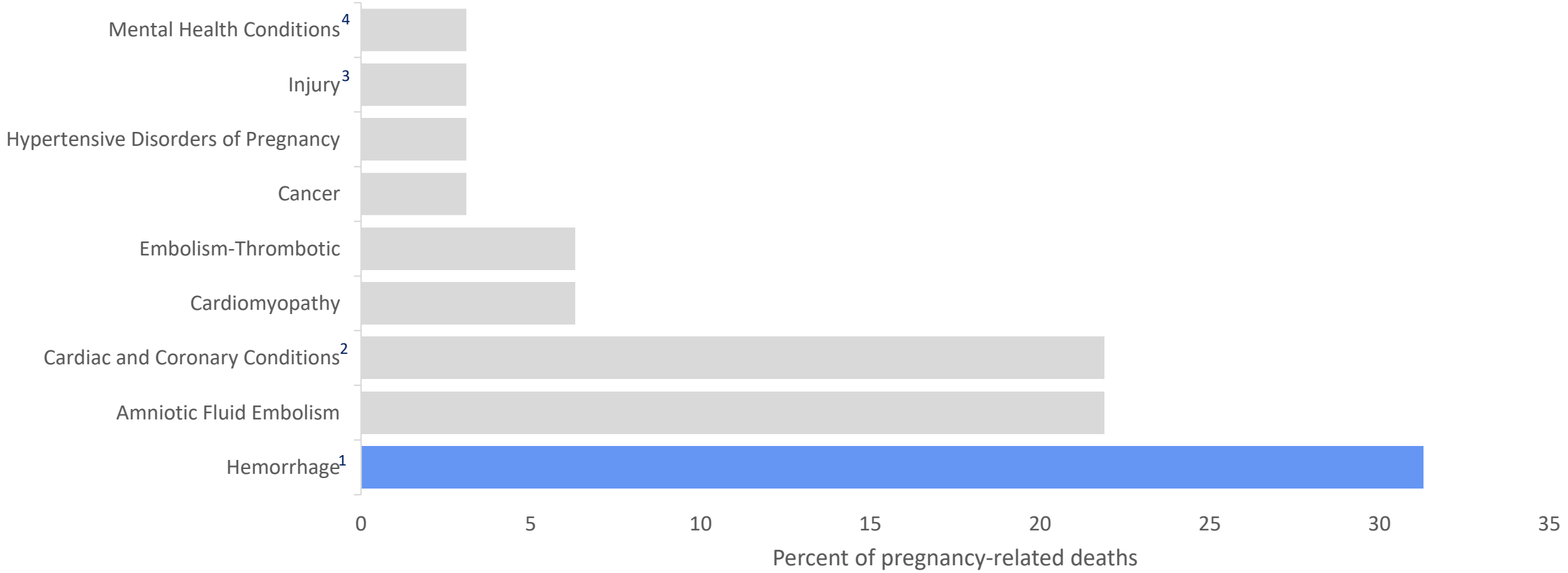
[2] Excludes aneurysms or cerebrovascular accident (CVA)

[3] Cardiac and coronary conditions include deaths to coronary artery disease, pulmonary hypertension, acquired and congenital valvular heart disease, vascular aneurysm, hypertensive cardiovascular disease, Marfan Syndrome, conduction defects, vascular malformations, and other cardiovascular disease; and excludes cardiomyopathy and hypertensive disorders of pregnancy.

[4] Injury includes intentional injury (homicide), unintentional injury, including overdose/poisoning deaths not related to substance use disorder, and injury of unknown intent or not otherwise specified.

*Only 10 most frequent underlying causes of death are shown. More than 10 are shown because the frequency was the same for the 10th cause for 2 causes; underlying cause of death was unknown for 3 (2.1%) pregnancy-related deaths.

Most Frequent Underlying Causes of Pregnancy-related Deaths Among non-Hispanic Asian Persons*



[1]Excludes aneurysms or cerebrovascular accident (CVA)

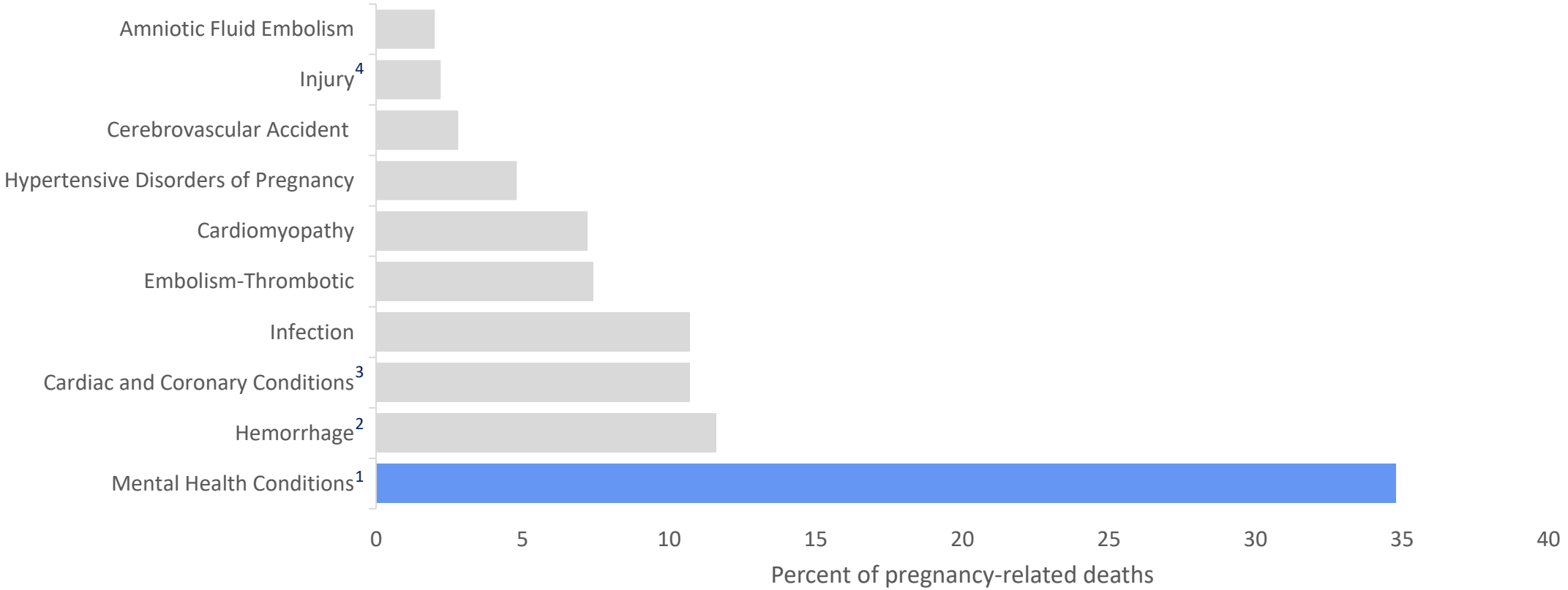
[2]Cardiac and coronary conditions include deaths to coronary artery disease, pulmonary hypertension, acquired and congenital valvular heart disease, vascular aneurysm, hypertensive cardiovascular disease, Marfan Syndrome, conduction defects, vascular malformations, and other cardiovascular disease; and excludes cardiomyopathy and hypertensive disorders of pregnancy.

[3]Injury includes intentional injury (homicide), unintentional injury, including overdose/poisoning deaths not related to substance use disorder, and injury of unknown intent or not otherwise specified.

[4]Mental health conditions include deaths to suicide, unintentional or unknown intent overdose/poisoning related to substance use disorder, and other deaths determined by the MMRC to be related to a mental health condition, including substance use disorder

*Underlying cause was unknown for 2 (5.9%) pregnancy-related deaths

Most Frequent Underlying Causes of Pregnancy-related Deaths Among non-Hispanic White Persons*



[1] Mental health conditions include deaths to suicide, unintentional or unknown intent overdose/poisoning related to substance use disorder, and other deaths determined by the MMRC to be related to a mental health condition, including substance use disorder

[2] Excludes aneurysms or CVA

[3] Cardiac and coronary conditions include deaths to coronary artery disease, pulmonary hypertension, acquired and congenital valvular heart disease, vascular aneurysm, hypertensive cardiovascular disease, Marfan Syndrome, conduction defects, vascular malformations, and other cardiovascular disease; and excludes cardiomyopathy and hypertensive disorders of pregnancy.

[4] Injury includes intentional injury (homicide), unintentional injury, including overdose/poisoning deaths not related to substance use disorder, and injury of unknown intent or not otherwise specified.

*Only 10 most frequent underlying causes of death are shown; underlying cause of death was missing (n=4) or unknown (n=6) for 10 (2.1%) pregnancy-related deaths.

Manner of Death

MANNER OF DEATH

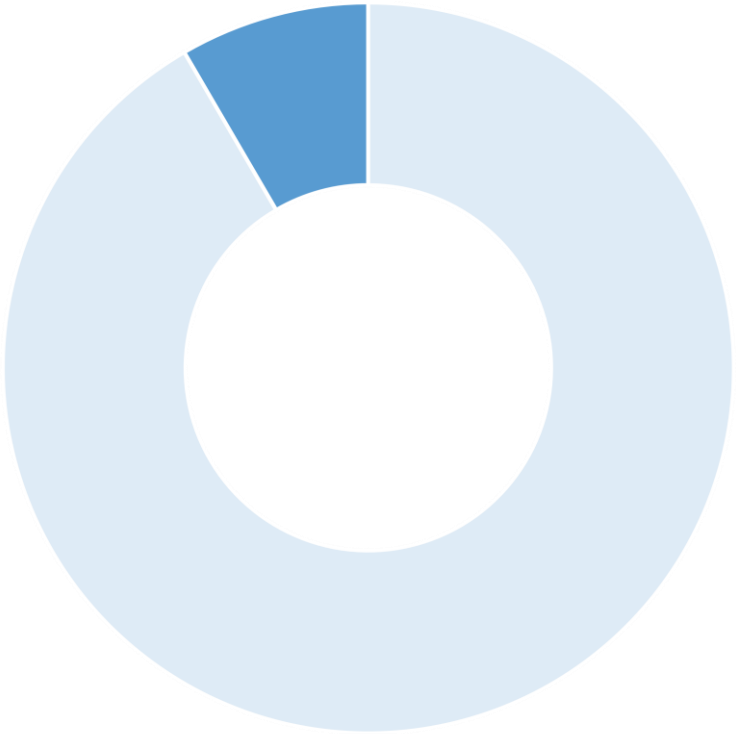
WAS THIS DEATH A SUICIDE?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
WAS THIS DEATH A HOMICIDE?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN

IF ACCIDENTAL DEATH, HOMICIDE, OR SUICIDE, LIST THE **MEANS OF FATAL INJURY**	☐ FIREARM ☐ SHARP INSTRUMENT ☐ BLUNT INSTRUMENT ☐ POISONING/ OVERDOSE ☐ HANGING/ STRANGULATION/ SUFFOCATION	☐ FALL ☐ PUNCHING/ KICKING/BEATING ☐ EXPLOSIVE ☐ DROWNING ☐ FIRE OR BURNS ☐ MOTOR VEHICLE	☐ INTENTIONAL NEGLECT ☐ OTHER, SPECIFY: ☐ UNKNOWN ☐ NOT APPLICABLE
IF HOMICIDE, WHAT WAS THE **RELATIONSHIP OF THE PERPETRATOR TO THE DECEDENT?**	☐ NO RELATIONSHIP ☐ PARTNER ☐ EX-PARTNER ☐ OTHER RELATIVE	☐ OTHER ☐ ACQUAINTANCE ☐ OTHER, SPECIFY:	☐ UNKNOWN ☐ NOT APPLICABLE

MMRC-Determined Manner of Death

8%

of pregnancy-related deaths were determined to be a suicide

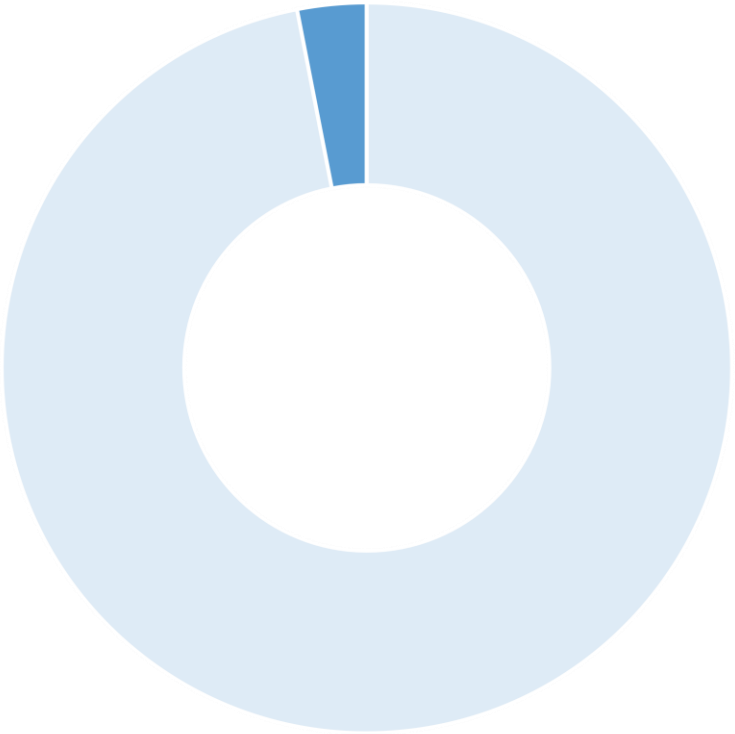


A suicide manner of death determination was missing (n=5) or unknown (n=42) for 47 (4.6%) pregnancy-related deaths.

MMRC-Determined Manner of Death

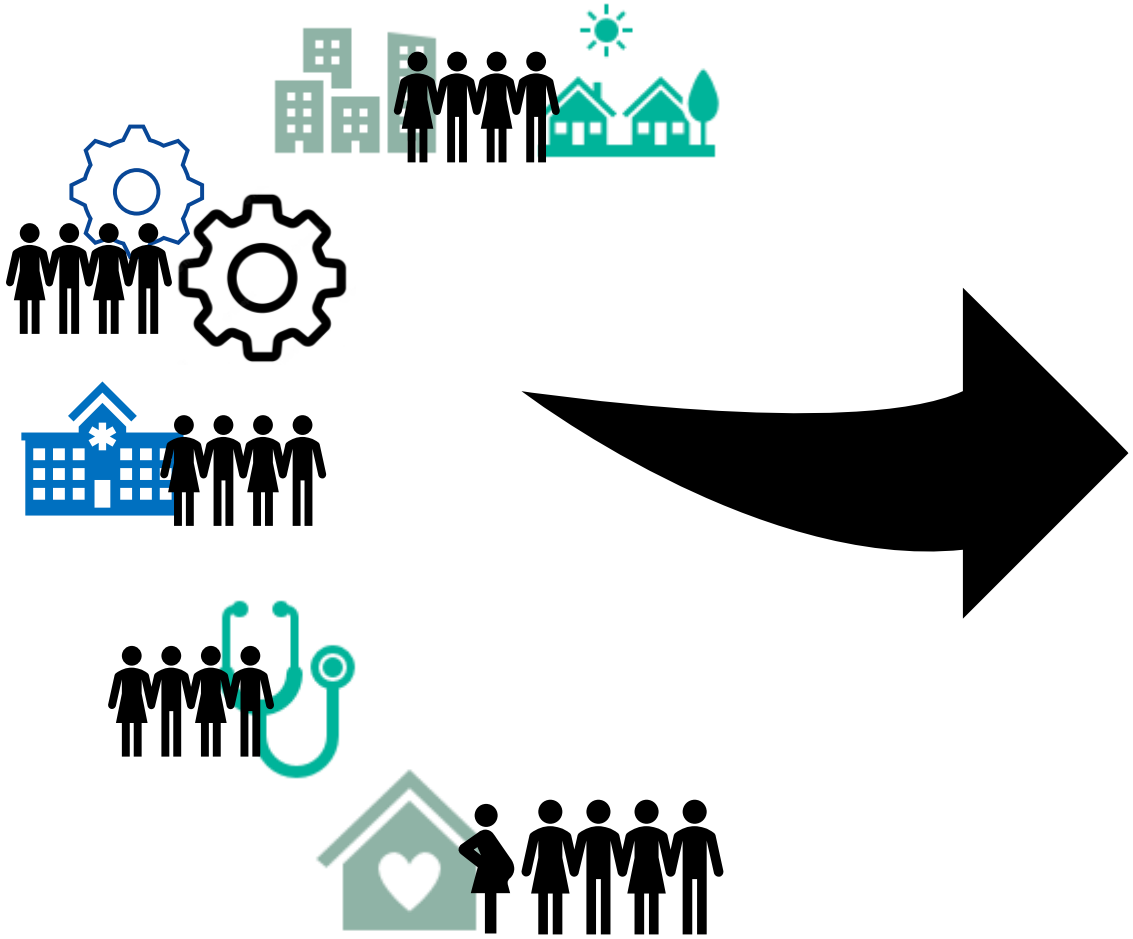
3%

of pregnancy-related deaths were determined to be a homicide



A homicide manner of death determination was missing (n=10) or unknown (n=7) for 17 (1.7%) pregnancy-related deaths.

MMRCs Determined:

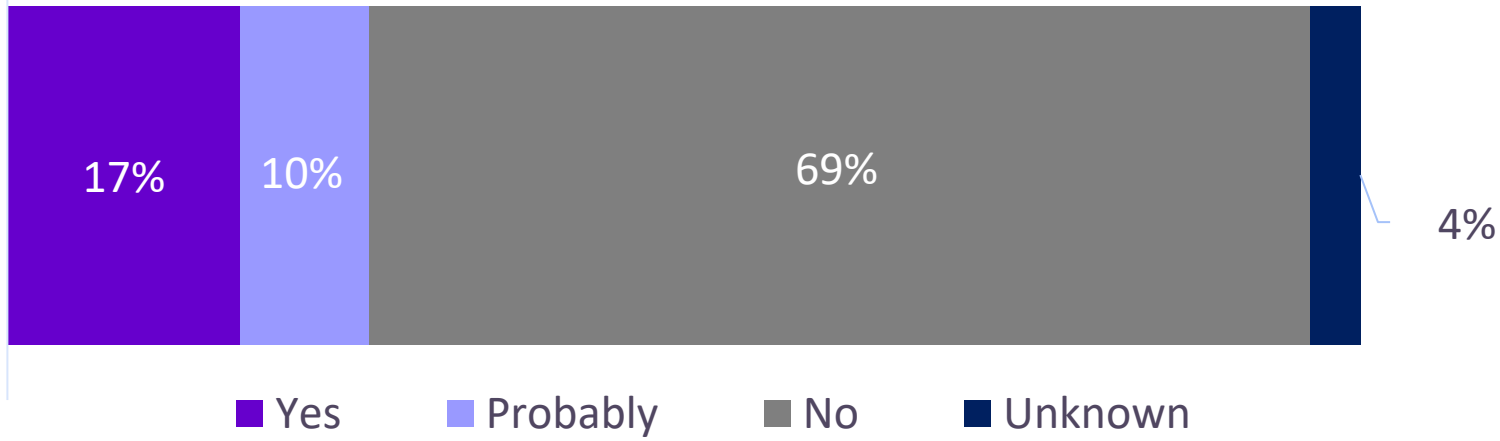


84% of pregnancy-related deaths were determined to be preventable

Committee determinations on Circumstances Surrounding Death, obesity

- This decision captures whether obesity contributed to the death, NOT whether the individual was obese/obesity was present. The committee may determine that obesity contributed to the death when the condition directly compromised their health status (e.g, obesity complicated ventilation options for a pregnant person with COVID).
- A high BMI may be a source of stigma leading to discrimination and victim-blaming. Completing this checkbox may help assess using aggregate analysis how often and under what circumstances obesity actually contributes to pregnancy-related deaths.
- Committee determinations for obesity was missing for 2 (0.2%) pregnancy-related death and are excluded from the below graph.

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

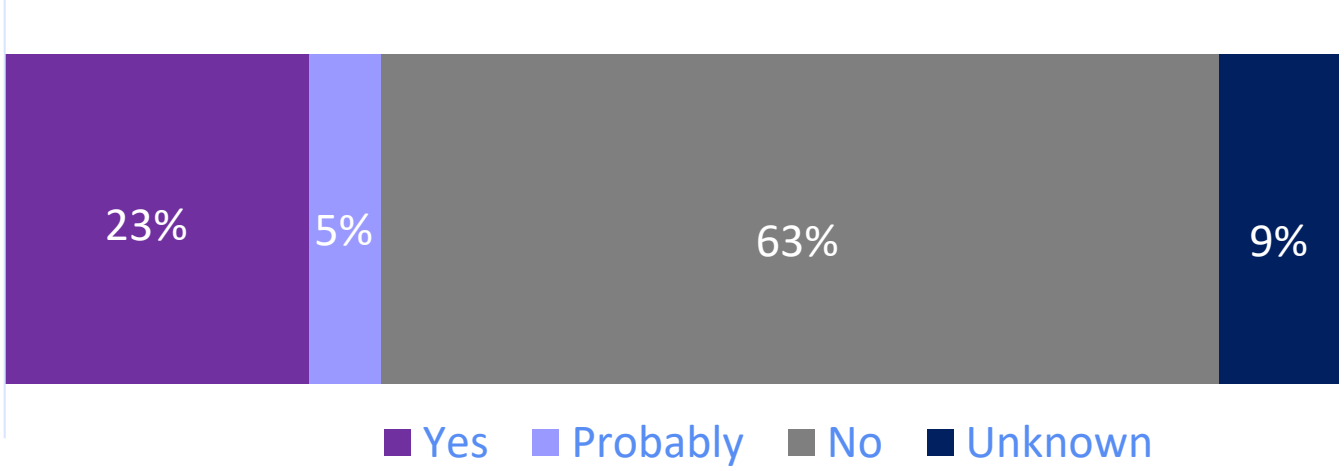


Provisional results

Committee determinations on Circumstances Surrounding Death, mental health conditions other than substance use disorder

- Determining if a mental health condition that is present contributed to the death is decided independent of whether a mental health condition was the underlying cause of death.
- Mental health conditions are identified as a circumstance by the committee when the patient had a documented diagnosis of a psychiatric disorder. This includes postpartum depression. If a formal diagnosis is not available, the committee will refer to their review committee subject matter experts (e.g, psychiatrist, psychologist, licensed counselor) to determine whether the criteria for a diagnosis of a mental health condition are met based on the available information.
- The committee may determine that a mental health condition contributed to the death when the condition directly compromised their health status (e.g., mental health condition impacted their ability to manage type II diabetes).
- Committee determinations for mental health conditions were missing for 4 (0.3%) pregnancy-related deaths and are excluded from the below graph.

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

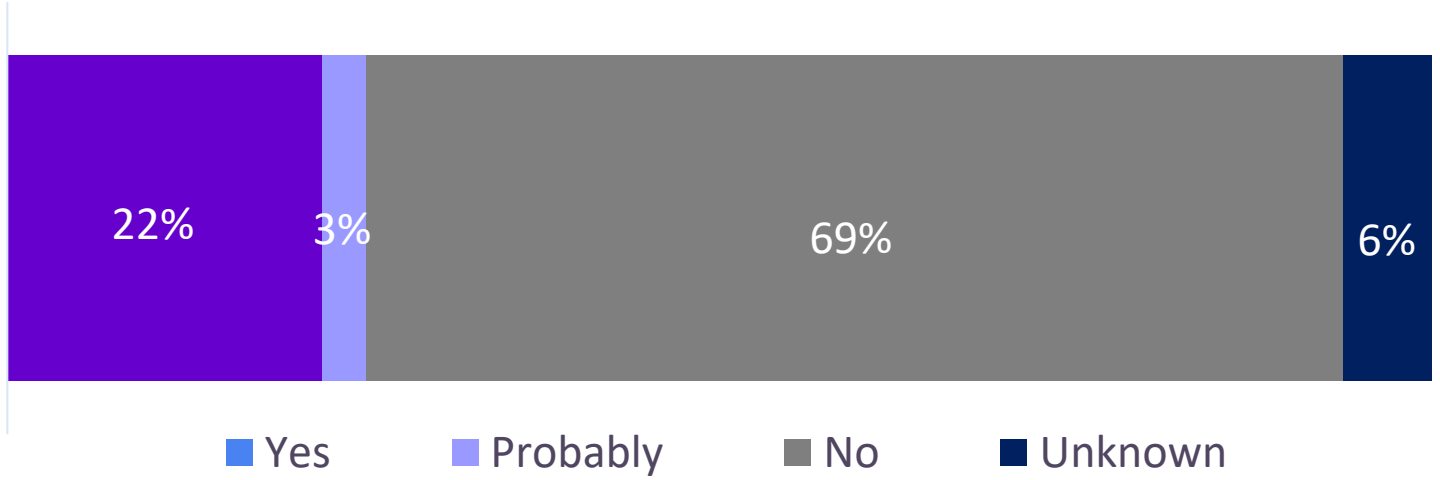


Provisional results

Committee determinations on Circumstances Surrounding Death, substance use disorder

- Substance use disorder is characterized by recurrent use of alcohol and/or drugs causing clinically and functionally significant impairment, such as health problems or disability.
- The committee may determine that substance use disorder contributed to the death when the disorder directly compromised their health status (e.g, acute methamphetamine intoxication exacerbated preeclampsia, or they were more vulnerable to infections or medical conditions).
- Committee determinations for substance use disorder were missing for 5 (0.5%) pregnancy-related deaths and are excluded from the below graph.

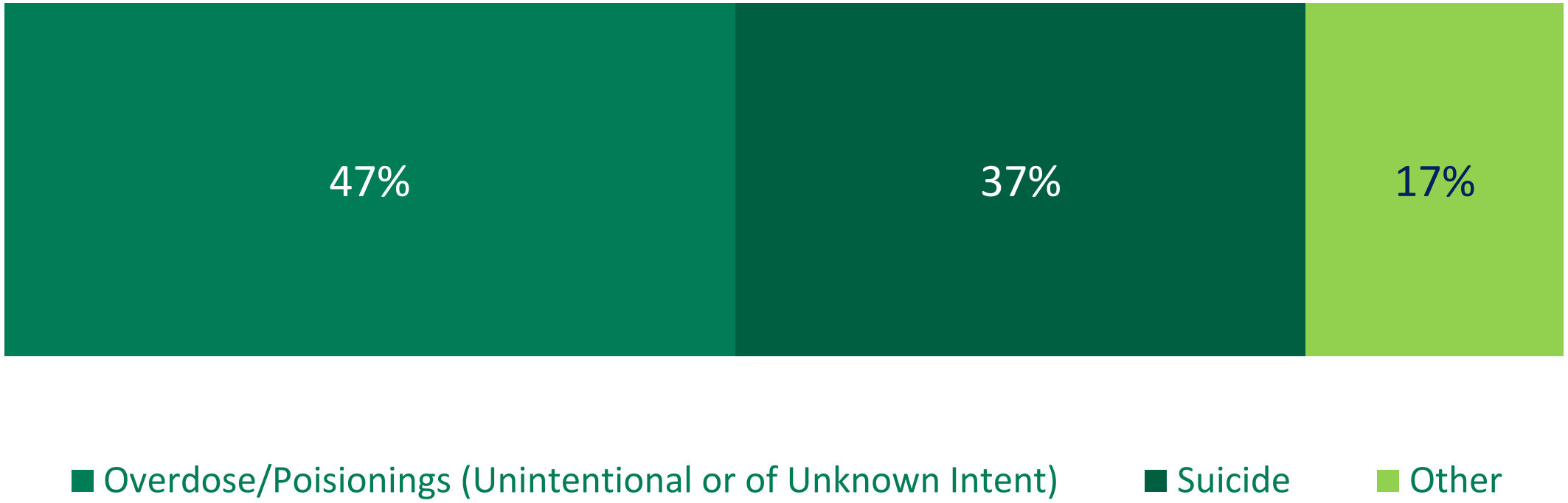
Committee determination on circumstances surrounding death: Did substance use disorder (SUD) contribute to the death?



Provisional results

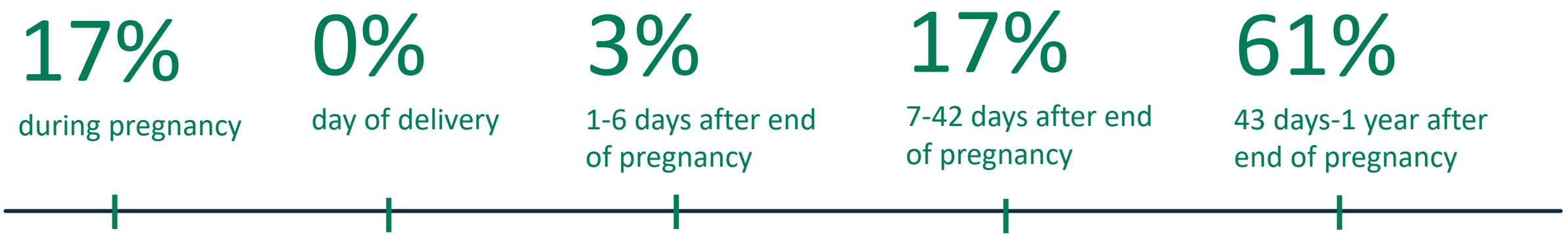
Half of the pregnancy-related deaths in 36 State Data are included in 3 underlying cause of death groups

Pregnancy-related Mental Health Deaths



Provisional results

Most Pregnancy-related Mental Health Deaths Occurred in the Late Postpartum



Timing of death was missing or unknown for 6 pregnancy-related mental health deaths

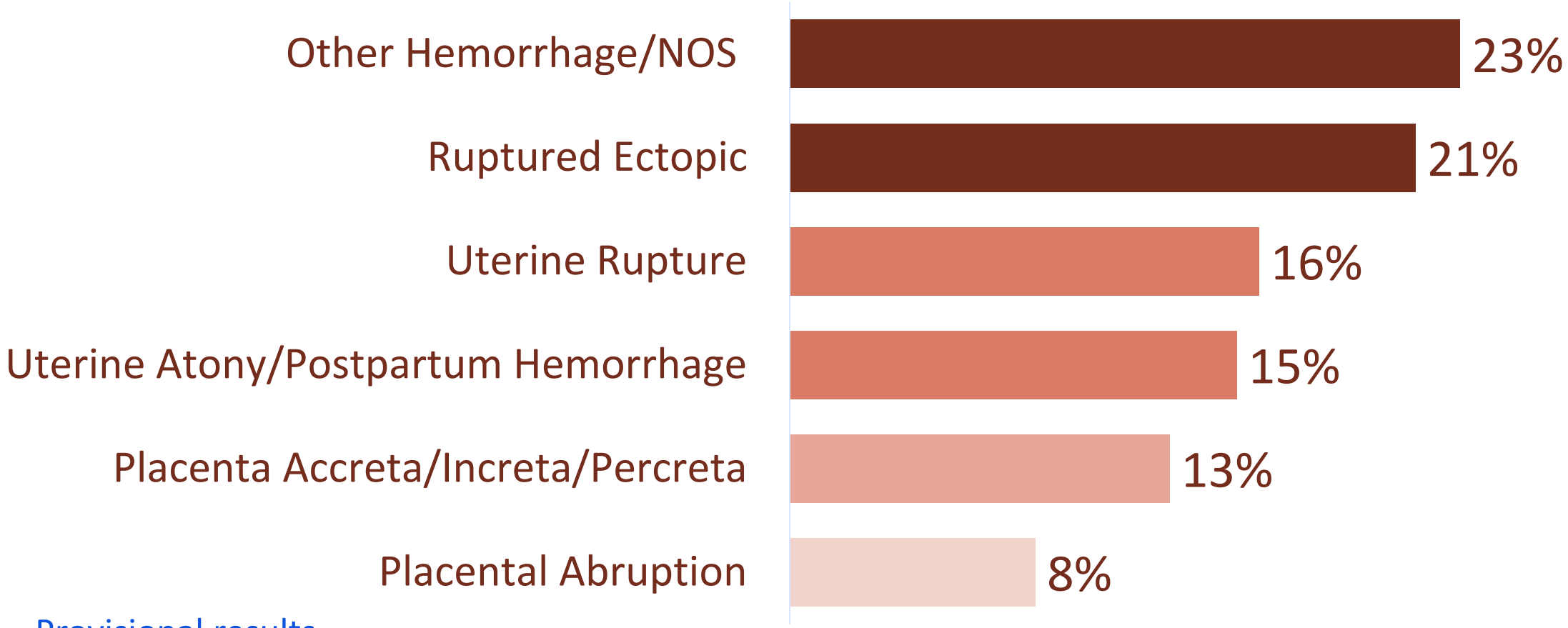
Provisional results

98% Of pregnancy-related mental health deaths with a preventability determination were determined to be preventable

A preventability determination was missing or unable to be determined for 2 pregnancy-related mental health deaths.

Provisional results

Pregnancy-related Hemorrhage Deaths



Provisional results

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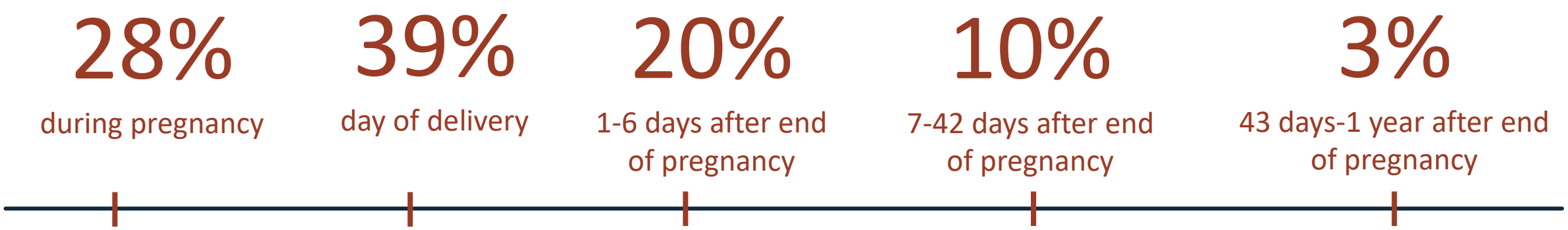
REVIEW to ACTION

Almost 90% of Hemorrhage deaths occurred during pregnancy or the first week after the end of pregnancy



Timing of death was missing or unknown for 1 pregnancy-related hemorrhage death

Provisional results

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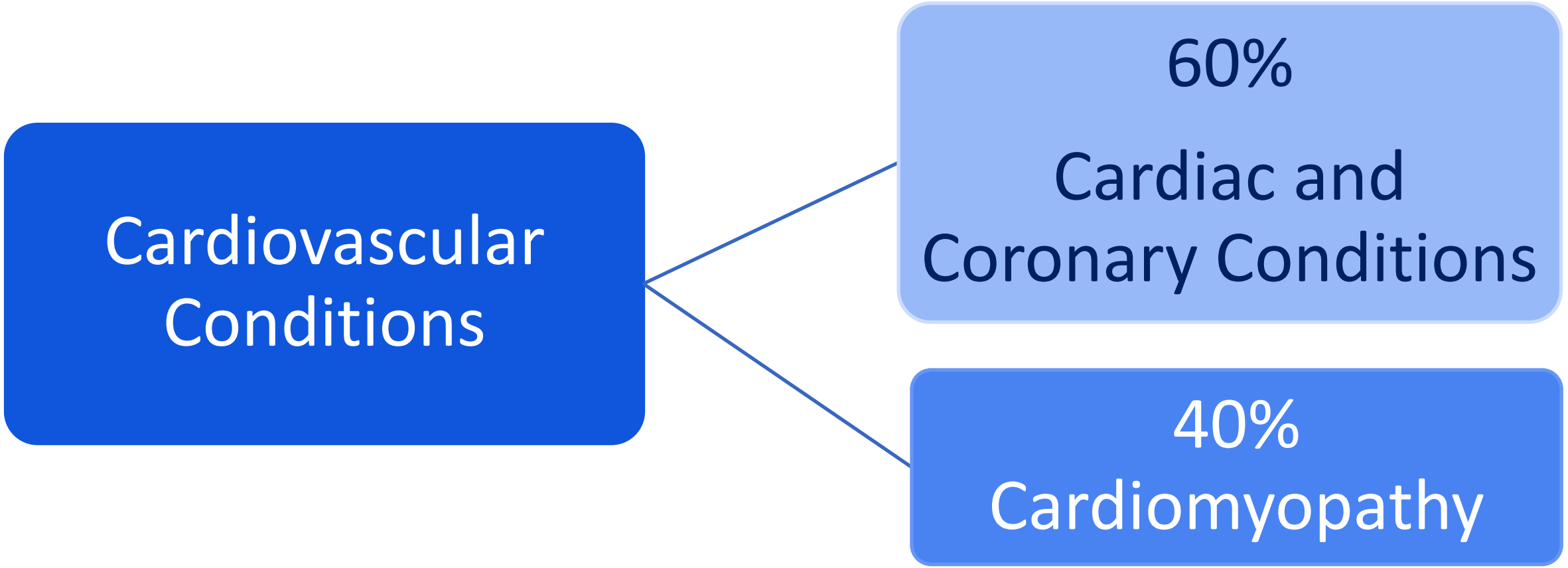
90% Of pregnancy-related hemorrhage deaths with a preventability determination were determined to be preventable

A preventability determination was missing or unable to be determined for 2 pregnancy-related hemorrhage deaths.

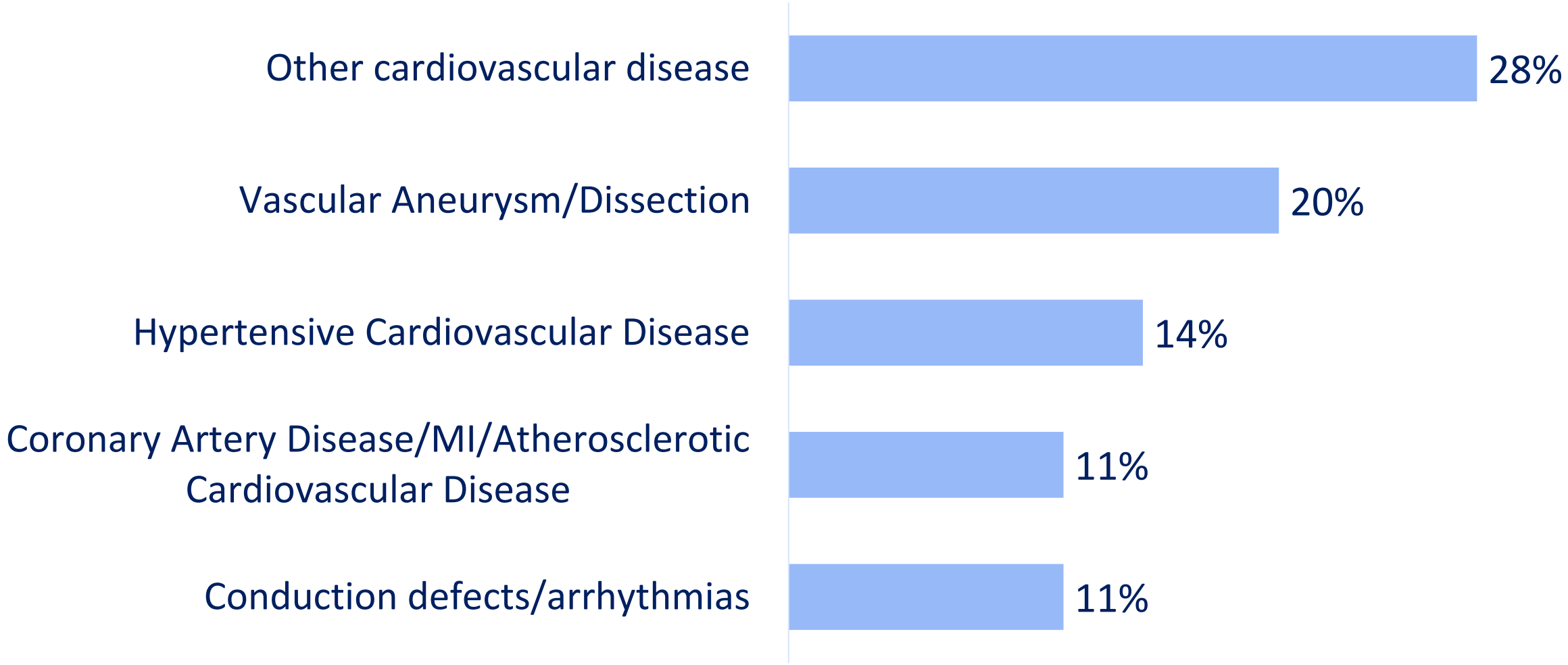
Provisional results

Pregnancy-related Cardiovascular Conditions Deaths



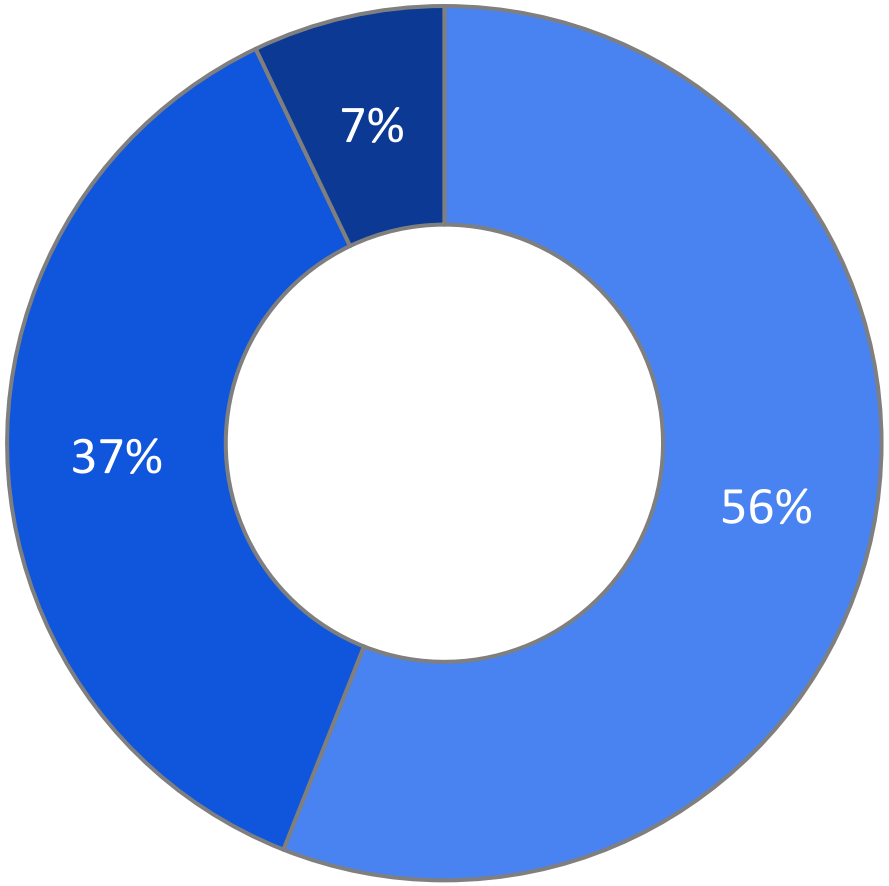
Provisional results

Cardiac and Coronary Conditions



Provisional results

Cardiomyopathy



Provisional results

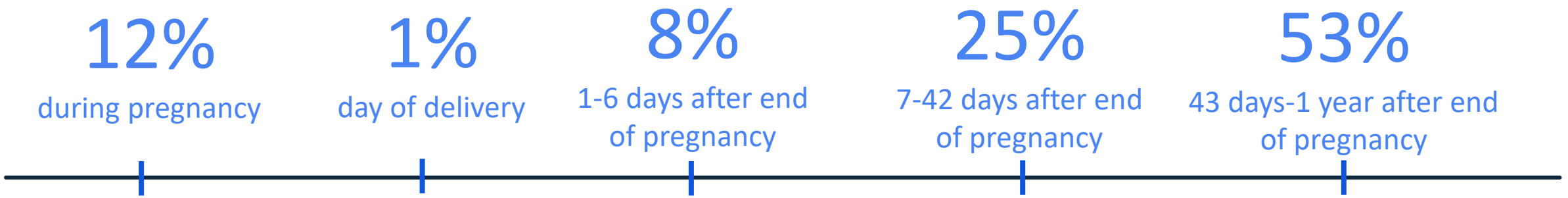
Among All Pregnancy-related Cardiac and Coronary Conditions

Provisional results

Timing of death was missing or unknown for 1 pregnancy-related cardiovascular and coronary conditions death

Among All Pregnancy-related Cardiac and Coronary Conditions

Among All Pregnancy-related Cardiomyopathy



Provisional results

Timing of death was missing or unknown for 1 pregnancy-related cardiovascular and coronary conditions death

75% of pregnancy-related Cardiac and Coronary Conditions deaths with a preventability determination were determined to be preventable

77% of pregnancy-related Cardiomyopathy deaths with a preventability determination were determined to be preventable

A preventability determination was missing or unable to be determined for 4 pregnancy-related cardiac and coronary conditions and 1 cardiomyopathy deaths.

Provisional results

Key Findings

- Pregnancy-related deaths occurred during pregnancy, delivery, and up to a year after the end of pregnancy
  - More than 50% of pregnancy-related deaths occurred 7 days to 1 year after the end of pregnancy
- The leading cause of pregnancy-related death varied by race and ethnicity
- Over 80% of pregnancy-related deaths were determined to be preventable

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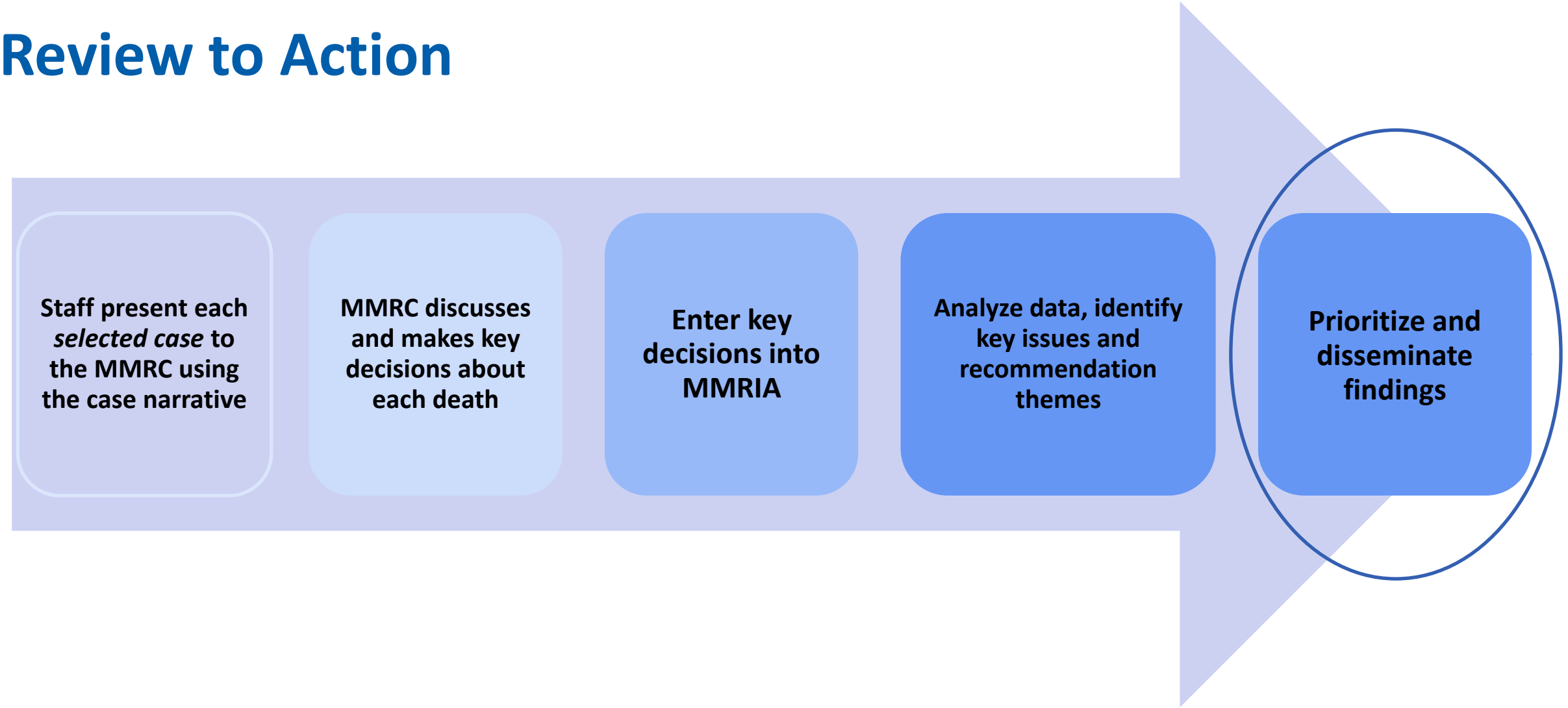
REVIEW to ACTION

Review to Action



Adapted from WA State DOH

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REVIEW to ACTION

Examples from Prior Qualitative Analyses of MMRIA Data

Community and Facility

Contributing Factor	Recommendations to Address Contributing Factor
Access to clinical care	Expand office hours; Increase number of providers who accept Medicaid; Increase availability of group prenatal care
Unstable housing	Prioritize pregnant women for temporary housing programs
Lack of/inadequate transportation options	Strengthen/build systems that link persons to affordable transportation; Provide vouchers for non-emergency transportation
Obesity and associated chronic condition complications	Improve access to healthy food options; Improve education and promotion of health eating habits and weight management strategies
Limited experience with OB emergencies	Implement OB emergency simulation training for Emergency Dept. staff; Ensure Emergency Dept staff ask about recent pregnancy history and consult with OB on call if pregnant within prior year
Lack of appropriate personnel or services	Increase access to telemedicine by facilities with no OB onsite; Ensure Medicaid managed care organizations' contracts include sufficient access to high risk care specialists
Lack of guiding protocols	Ensure sepsis, hemorrhage, and mass transfusion protocols are in place and monitor for staff use; Develop/implement relevant patient safety bundles; Implement systems that foster care coordination across providers; Increase use of patient navigators

Examples from Prior Qualitative Analyses of MMRIA Data

Patient and Provider

Contributing Factor	Recommendations to Address Contributing Factor
Lack knowledge of warning signs or need to seek care	Improve counseling and increase use of patient education materials on warning signs and when to seek care, such as the AWHONN *Save Your Life* discharge instructions
Non-adherence to medical regimens or advice	Standardize patient education to ensure providers communicate consistent messages; Implement techniques that ensure patient understanding, such as patient "teaching back" to the provider; Make education materials available in clinic and online; Strengthen/expand access to patient navigators, case managers, and peer support; Ensure access/use of interpreter services when needed; Increase home health or social work follow-up services
Missed/delayed diagnosis	Repeat blood pressure measurement in a timely manner (and perhaps manually) when initial blood pressure result is unexpected; Offer/expand non-OB provider education on cardiac conditions in pregnant and postpartum women; Increase the thorough evaluation of patients with pain and shortness of breath
Inappropriate/delayed treatment	Establish polices and protocols that support only performing cesarean deliveries when medically indicated; Implement a maternal early warning system
Lack of continuity of care	Improve care transition protocols and communication between OB providers and primary care providers and specialty care providers

Examples from Prior Qualitative Analyses of MMRIA Data

System(s)

Contributing Factor	Recommendations to Address Contributing Factor
Inadequate receipt of care	Develop/expand implementation of policies that ensure women deliver at/are transported to a hospital with a level of maternal care that matches her health risk; Enlist state perinatal quality collaboratives to identify quality improvement procedures and periodic drills/simulation training for birth facilities, including OB emergencies; Design/expand implementation of education initiatives
Case coordination/management	Extend/expand Medicaid eligibility for pregnant women to include 1 year of postpartum care; Create a quality improvement entity to manage outpatient care gaps and implement and monitor care coordination improvements; Develop/implement a postpartum care bundle that integrates services for high risk women; Develop and implement protocols and polices that improve hospital documentation of abnormal test results, follow-up care plans, and condition management plans; Develop a universal electronic health record system that allows sharing medical records within and between hospitals
Guiding policies, procedures, or standards not in place	Develop and implement protocols and policies that increase timely referrals and consultation; Increase (and monitor for) consistency of protocols and policies within healthcare systems

Data to Action Examples

Data to Action – Tennessee

REDUCING PREVENTABLE MATERNAL DEATHS

WHAT HEALTH CARE PROVIDERS CAN DO

- Develop protocols for interpersonal violence screening
- Implement systems of care for mental health disorders
- Implement education on implicit bias for staff
- Provide consistent screening, assessment and treatment for cardiac conditions
- Increase access to naloxone

81%

OF DEATHS

were determined to be preventable with **37%** having a good chance and **44%** having some chance of being prevented

*Total of pregnancy-related and not-related deaths does not add up to the total deaths because relatedness could not be determined in some cases.

Tennesee Department of Health, Authorization No. XXXXXX, XXXX copies, August 2020. This public document was promulgated at a cost of $0.06 per copy.

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TN Department of Health

Visit the Tennessee maternal mortality review program webpage at https://www.tn.gov/health/health-program-areas/fhw/maternal-mortality-review.html

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REVIEW to ACTION

Data to Action – Illinois

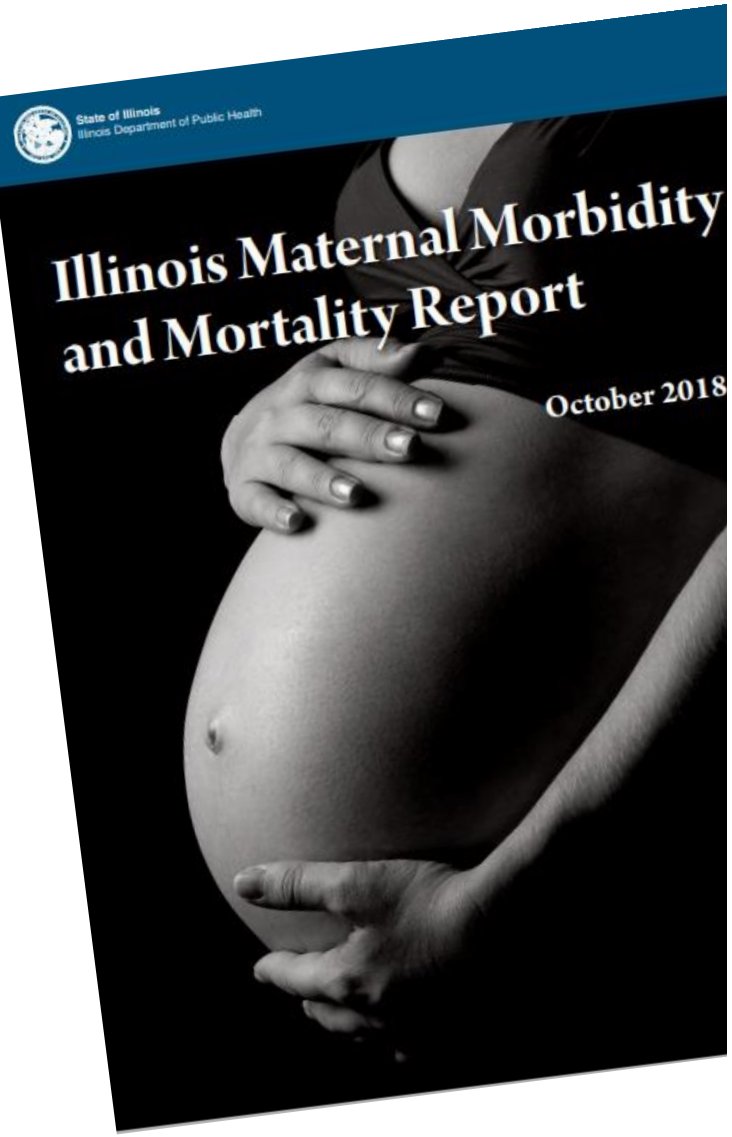
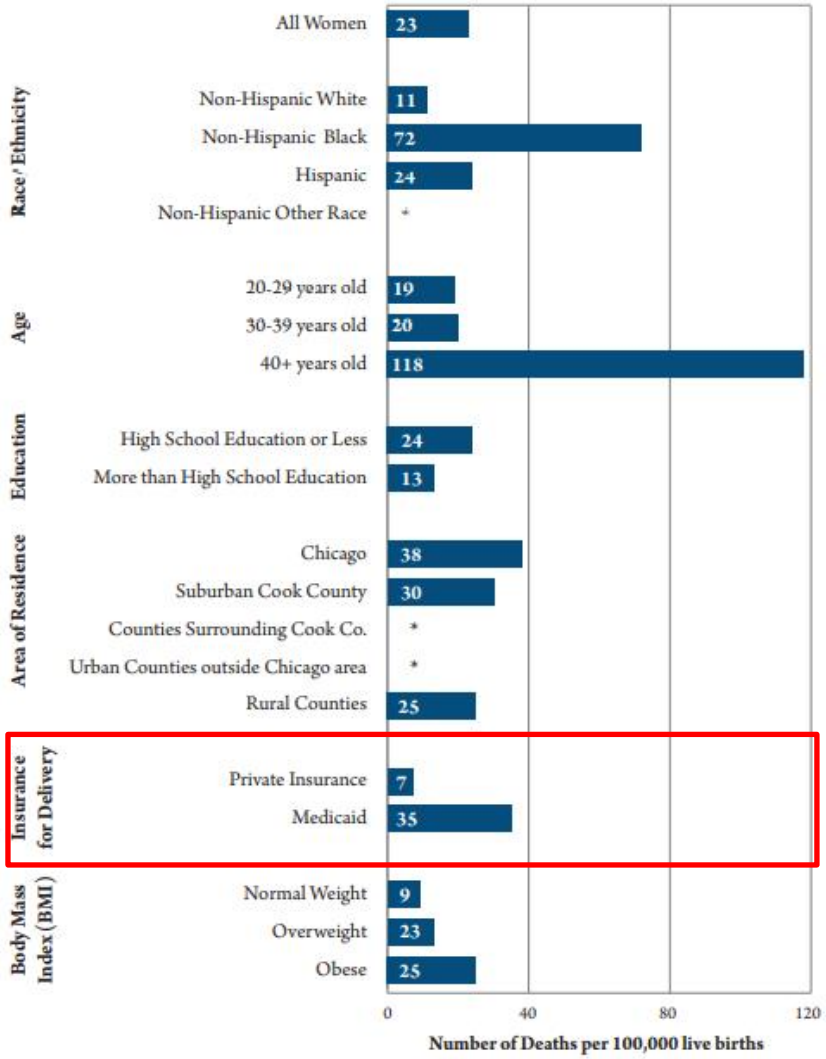


Figure 12: Pregnancy-Related Mortality Ratio (PRMR), By Demographics, Illinois 2015



** Fewer than 5 deaths is not reported due to small sample size*

- 15 bills addressing maternal morbidity and mortality introduced in the State Legislature
- Extended Medicaid coverage for postpartum women out to 1 year

Source: Illinois Maternal Morbidity and Mortality Report. Illinois Department of Public Health (October 2018)

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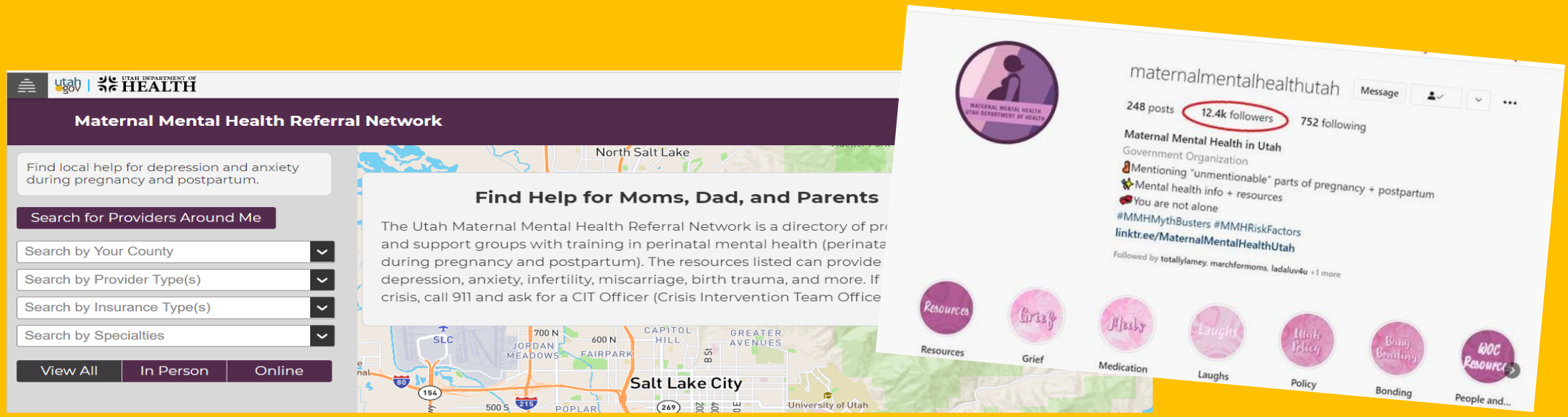
REVIEW to ACTION

Data to Action –
Utah Maternal Mental Health Resources

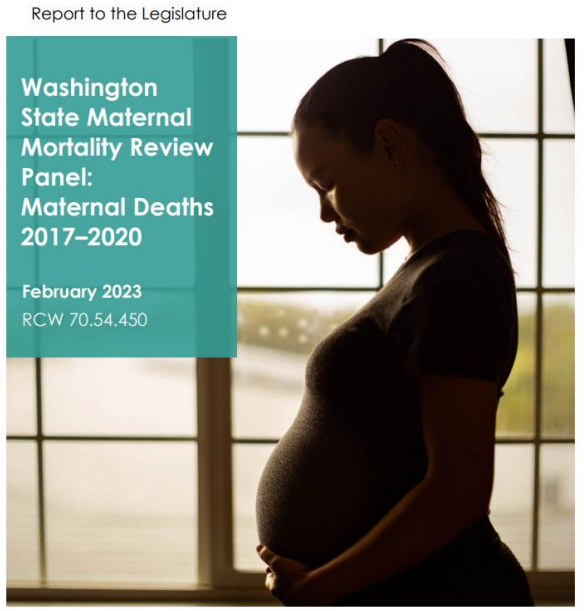
- The UT MMRC prioritized a recommendation to ‘educate providers on available mental health resources and specialists they can refer patients to in the perinatal period’
- In response, the UT Department of Health launched the Utah Maternal Mental Health Resource Network



Source: https://maternalmentalhealth.utah.gov/

Data to Action – Washington State

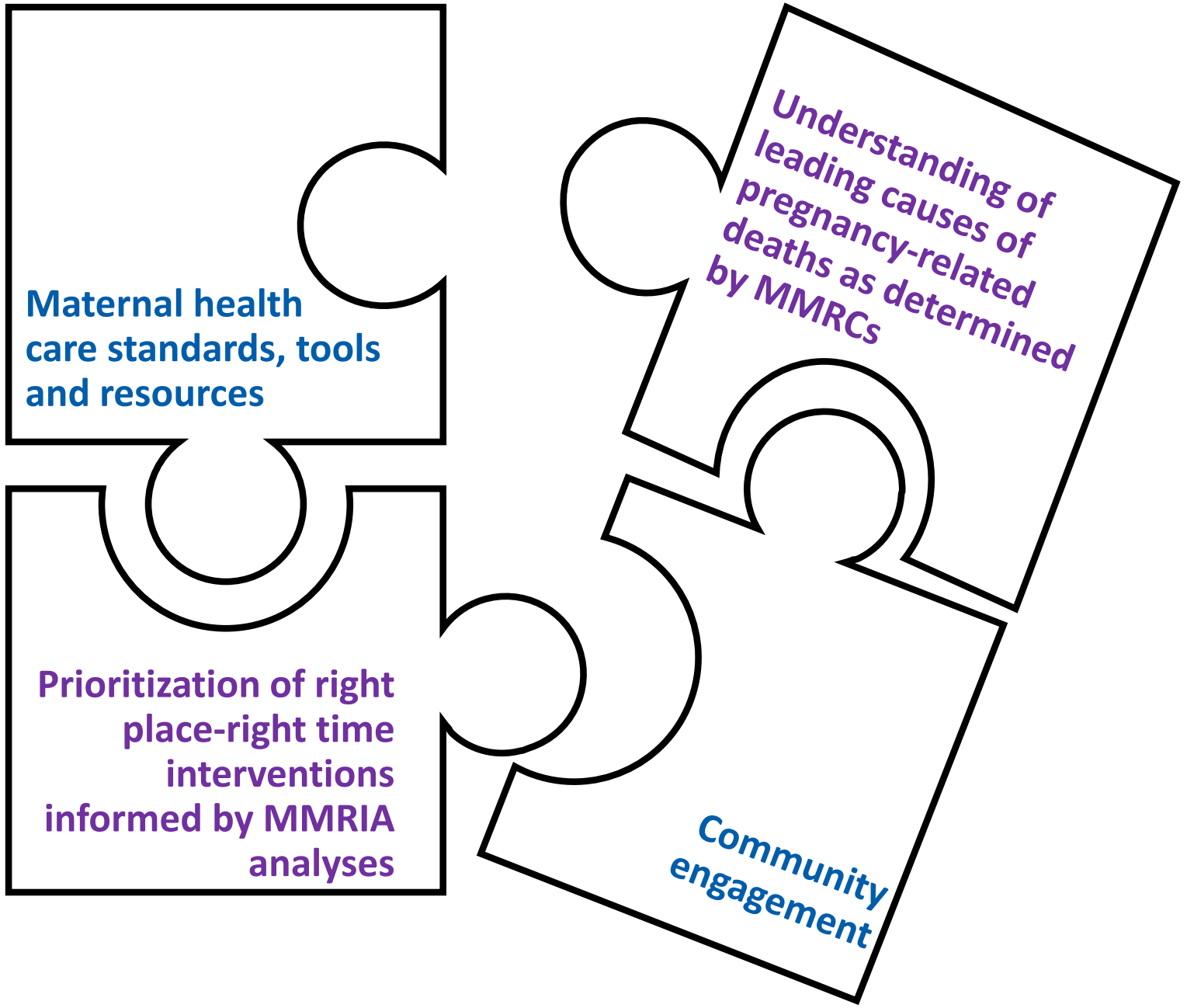
- Washington State Department of Health Maternal Mortality Review Panel found:
  - Pregnancy-related deaths were not always referred to local coroner and medical examiner offices;
  - Even when deaths were referred, autopsies were not always performed;
  - Autopsy quality varied.



- Washington passed a law requiring birthing hospitals and centers to refer deaths of women who are pregnant, or have been pregnant within 42 days of death, to the local coroner or medical examiner's office; and provided a funding source for these autopsies.

Source: Maternal mortality review panel—Duties—Confidentiality, testimonial privilege, and liability—Identification of maternal deaths—Reports—Data-sharing agreements, RCW 70.54.450 (2016).

Data Informing Action



Opportunities for Networking and Collaboration

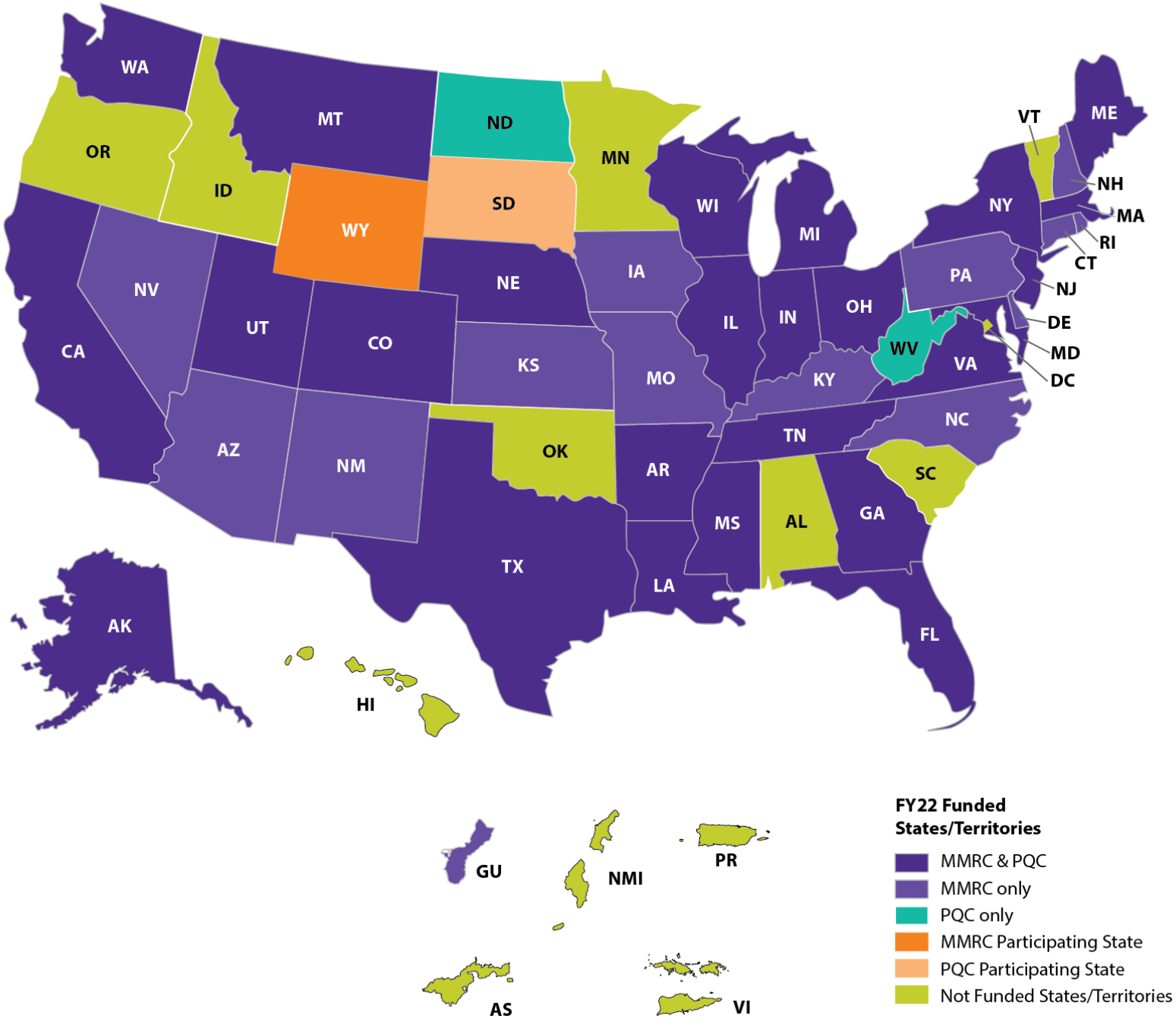
PQCs can be an action arm for MMRC recommendations.

Perinatal Quality Collaboratives (PQCs)

State or multi-state networks of **multidisciplinary teams** working to improve **population-level maternal and infant health care and outcomes statewide**

- Advance **evidence-based** clinical practices and processes using **quality improvement (QI) principles**
- **Convene and collaborate** with **diverse representatives** (clinical teams, experts, partners, patients, families) to **address gaps** and **reduce variation** in care and outcomes

https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pqc.htm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AS
VI
FY22 Funded States/Territories
MMRC & PQC
MMRC only
PQC only
MMRC Participating State
PQC Participating State
Not Funded States/Territories

THANK YOU

Q&A

For more information, contact:

ERASEMM@cdc.gov

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