Strategies for Improving Maternal Health

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Chief, Maternal and Infant Health Branch, Division of Reproductive Health, CDC
Secretary's Advisory Committee on Infant Mortality
December 4, 2019




Centers for Disease Control and Prevention

National Center for Chronic Disease Prevention and Health Promotion

Division of Reproductive Health

AGENDA

- The relationship between maternal and infant outcomes
- Data on Pregnancy-Related Deaths
- Efforts to strengthen surveillance through assessment and quality improvement
- Summary

THE RELATIONSHIP BETWEEN MATERNAL AND INFANT OUTCOMES

MATERNAL HEALTH IS A KEY DRIVER OF INFANT HEALTH

Maternal conditions, behaviors, and environments contribute to infant health and mortality, including pre-term births.

- Hypertensive disorder / cardiovascular disease
- Diabetes
- Obesity
- Tobacco
- Substance Use
- Access to fruits and vegetables
- Environment/Social Determinants of Health
- Access to quality care and services

Top causes of infant mortality, affected by maternal health.

- Birth defects/congenital malformations
- Disorders related to short gestation and low birthweight
- **Newborn affected by maternal complications of pregnancy**
- Sudden Infant Death syndrome
- Newborn injuries

Sources: CDC Division of Reproductive Health; "Gestational Diabetes." Centers for Disease Control and Prevention. July 25 2017. Retrieved from https://www.cdc.gov/diabetes/basics/gestational.html

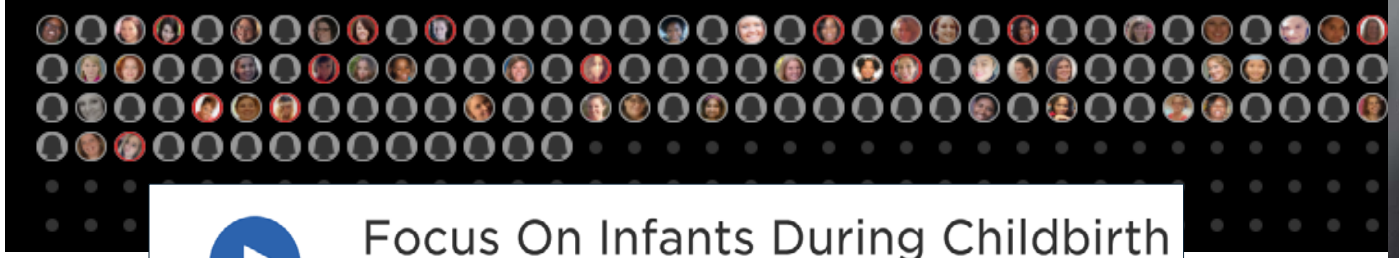
Maternal Morbidities Drive Maternal Outcomes: Maternal Mortality

PRO PUBLICA

Lost Mothers

An estimated 700 to 900 women in the U.S. died from pregnancy-related causes in 2016. We have identified 134 of them so far.

by Nina Martin, ProPublica, Emma Cillekens and Alessandra Freitas, special to ProPublica
July 17, 2017



The New York Times Magazine

FEATURE

Why America's Black Mothers and Babies Are in a Life-or-Death Crisis

The answer to the disparity in death rates has everything to do with the lived experience of being a black woman in America.

Focus On Infants During Childbirth Leaves U.S. Moms In Danger

12:11

+ QUEUE

EMBED

May 12, 2017 · 5:00 AM ET

Heard on Morning Edition

NINA MARTIN, PROPUBLICA

RENEE MONTAGNE

npr

CNN

Childbirth is killing black women in the US, and here's why

CBS NEWS / *August 5, 2018, 10:06 AM*

Maternal mortality: An American crisis

CBS NEWS

TOO MANY MOTHERS DIE

700

- 700 women die each year in U.S. from pregnancy-related causes
- Includes during pregnancy, labor/delivery, or up to a year after the end of pregnancy

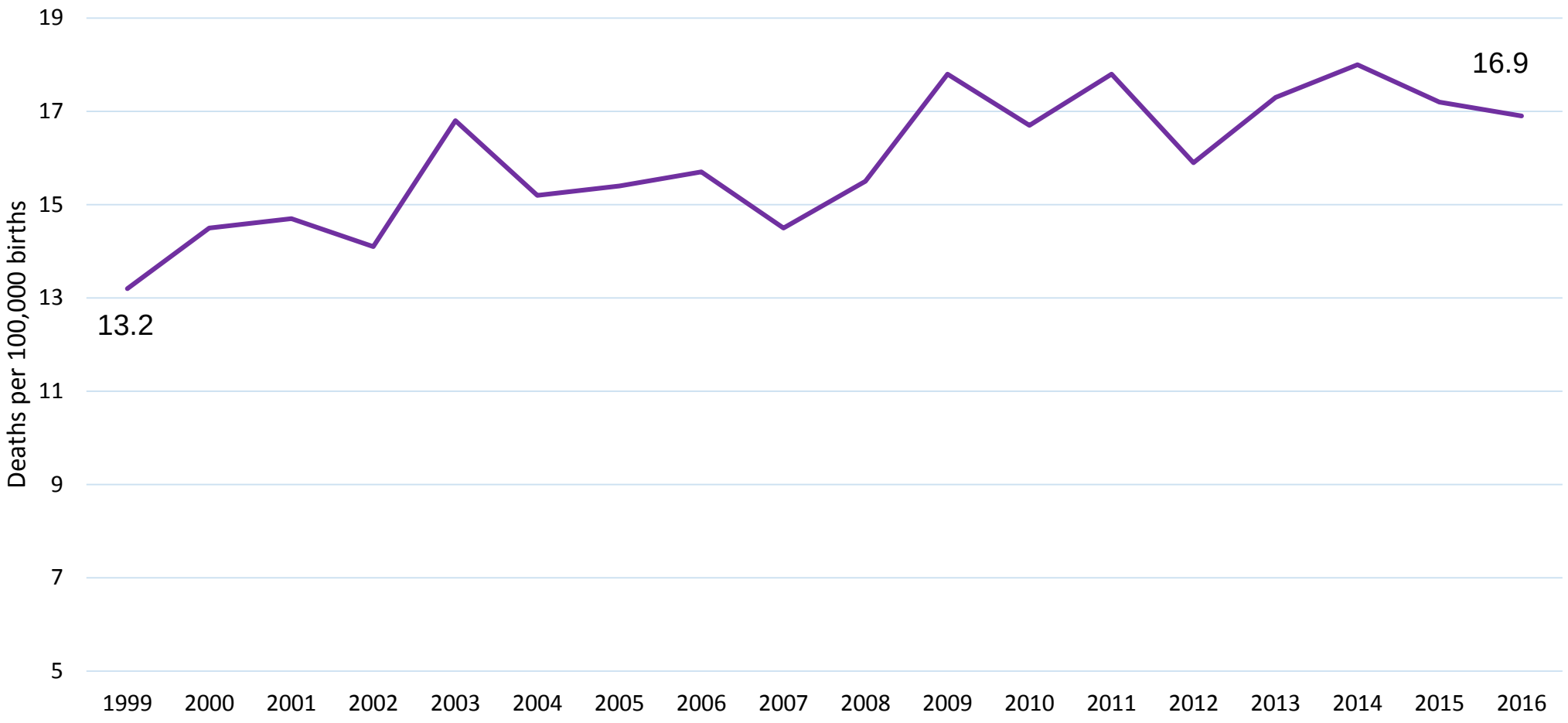
2-3X

- American Indian/ Alaskan Native 2 times more likely to die than white women
- Black women 3 times more likely to die than white women

66%

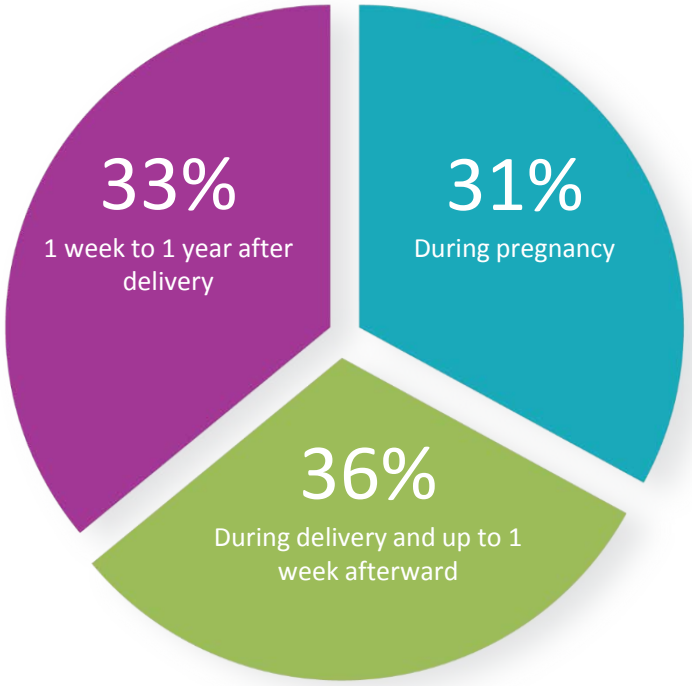
- About 66% of these deaths may be preventable

PREGNANCY-RELATED MORTALITY IS NOT IMPROVING



Source: Pregnancy Mortality Surveillance System (PMSS): 1999-2016.

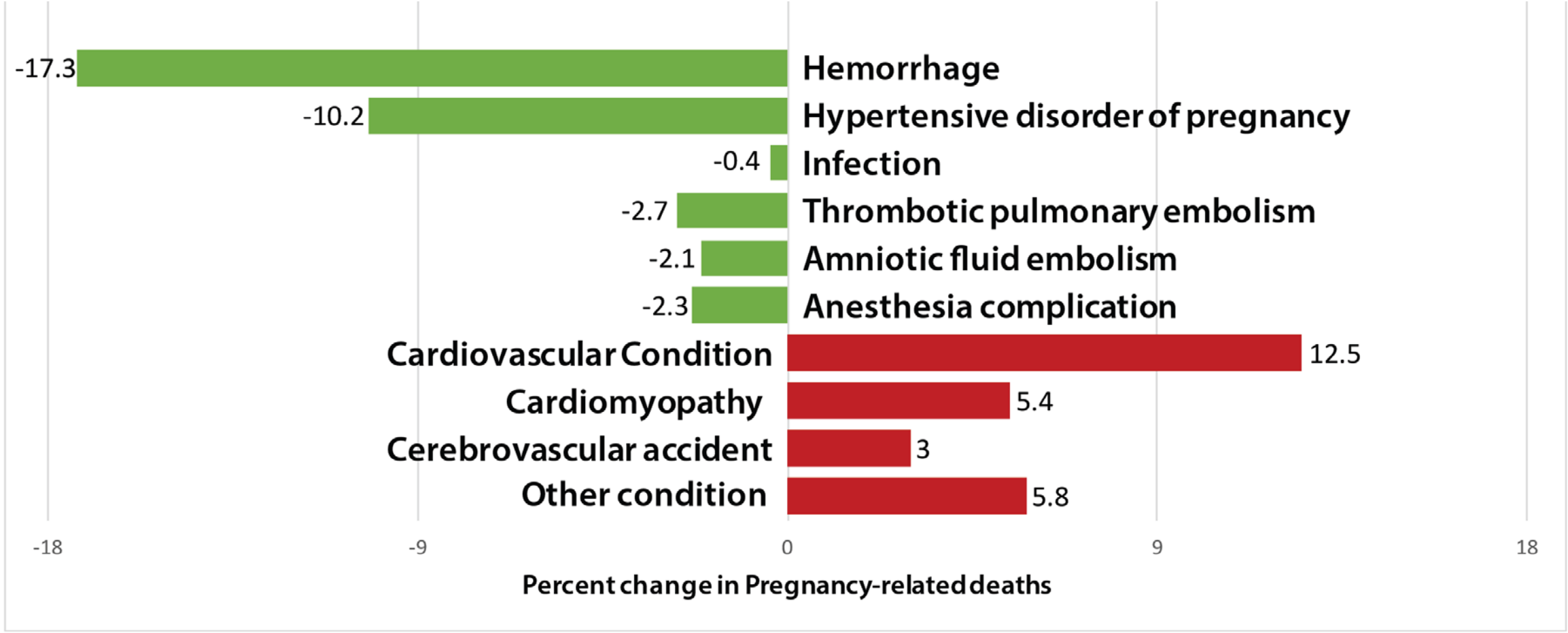
MAJORITY OF PREGNANCY-RELATED DEATHS OCCUR OUTSIDE THE DELIVERY HOSPITALIZATION, AND THE LEADING CAUSES OF DEATH VARY



- During pregnancy: cardiovascular conditions
- At delivery: severe bleeding and amniotic fluid embolism
- In the week after delivery: severe bleeding and hypertensive disorders of pregnancy
- 1 week to 42 days after delivery: infection
- 43 days to 1 year after delivery: cardiomyopathy

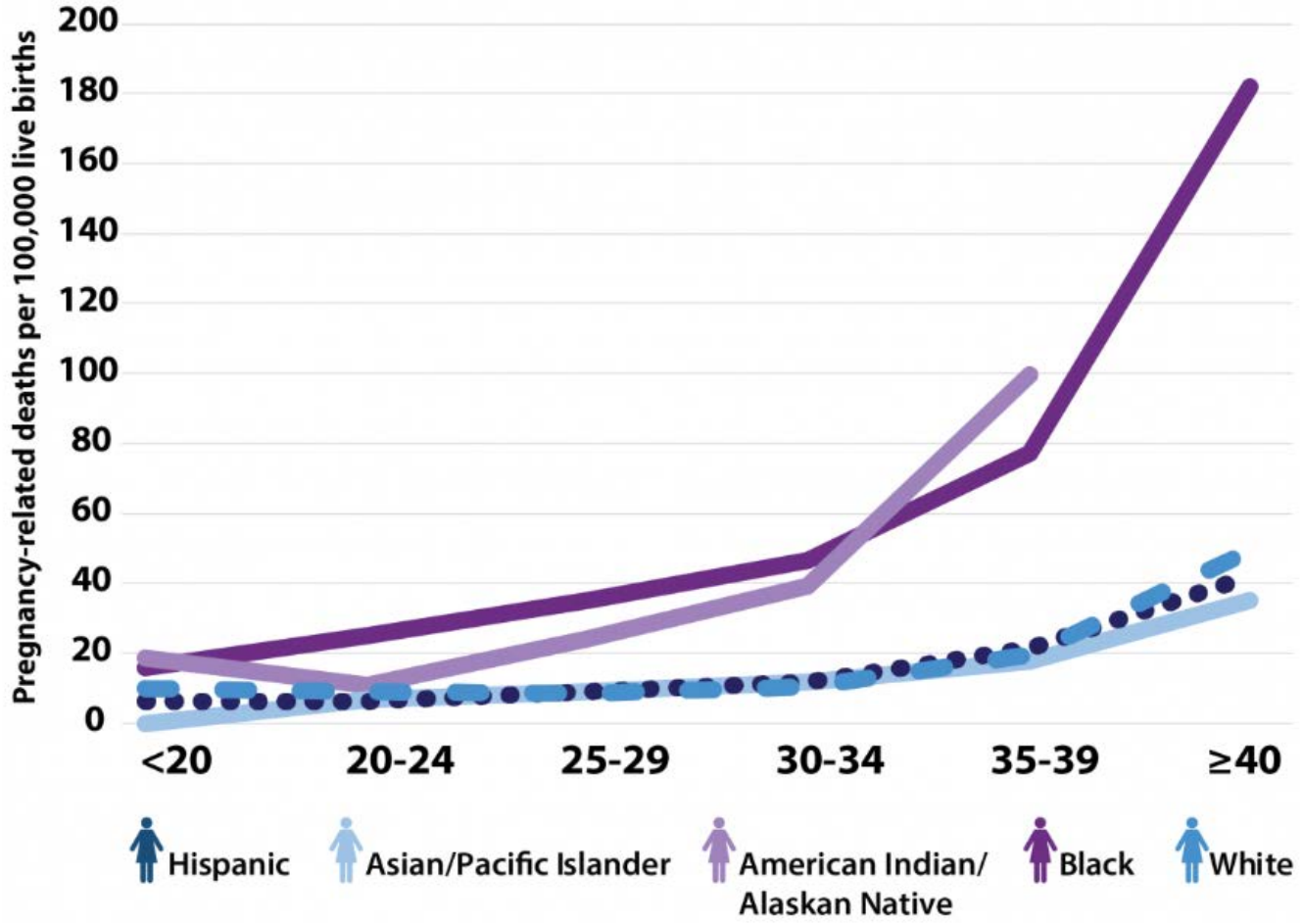
Source: Petersen EE, et al. *Vital Signs*: Pregnancy-Related Deaths, United States, 2011–2015 . MMWR Morb Mortal Wkly Rep 2019;68:423–429.

CAUSES OF PREGNANCY-RELATED DEATHS CHANGED BETWEEN 1987 AND 2013



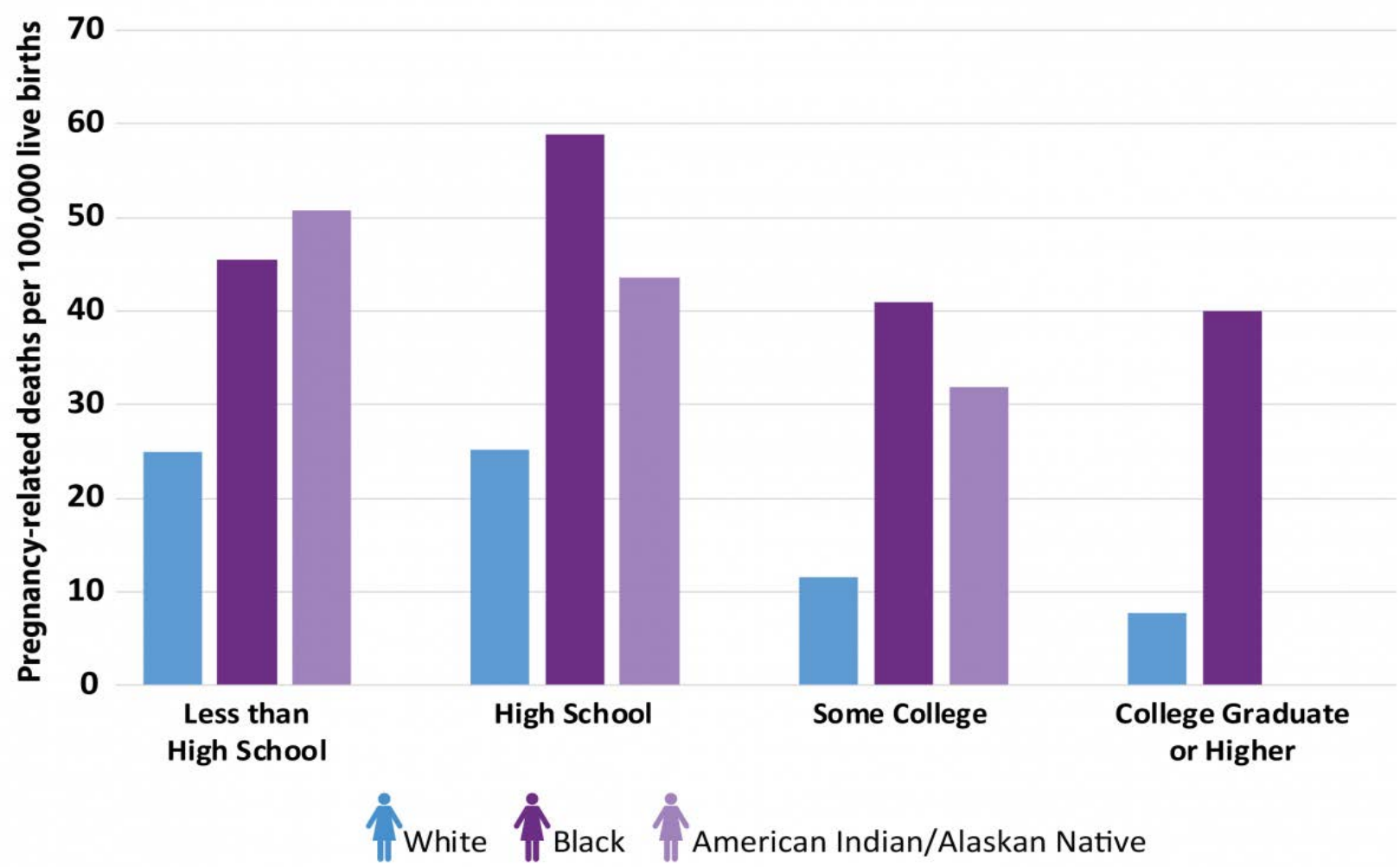
Source: Pregnancy Mortality Surveillance System

RISK INCREASES DIFFERENTLY WITH AGE

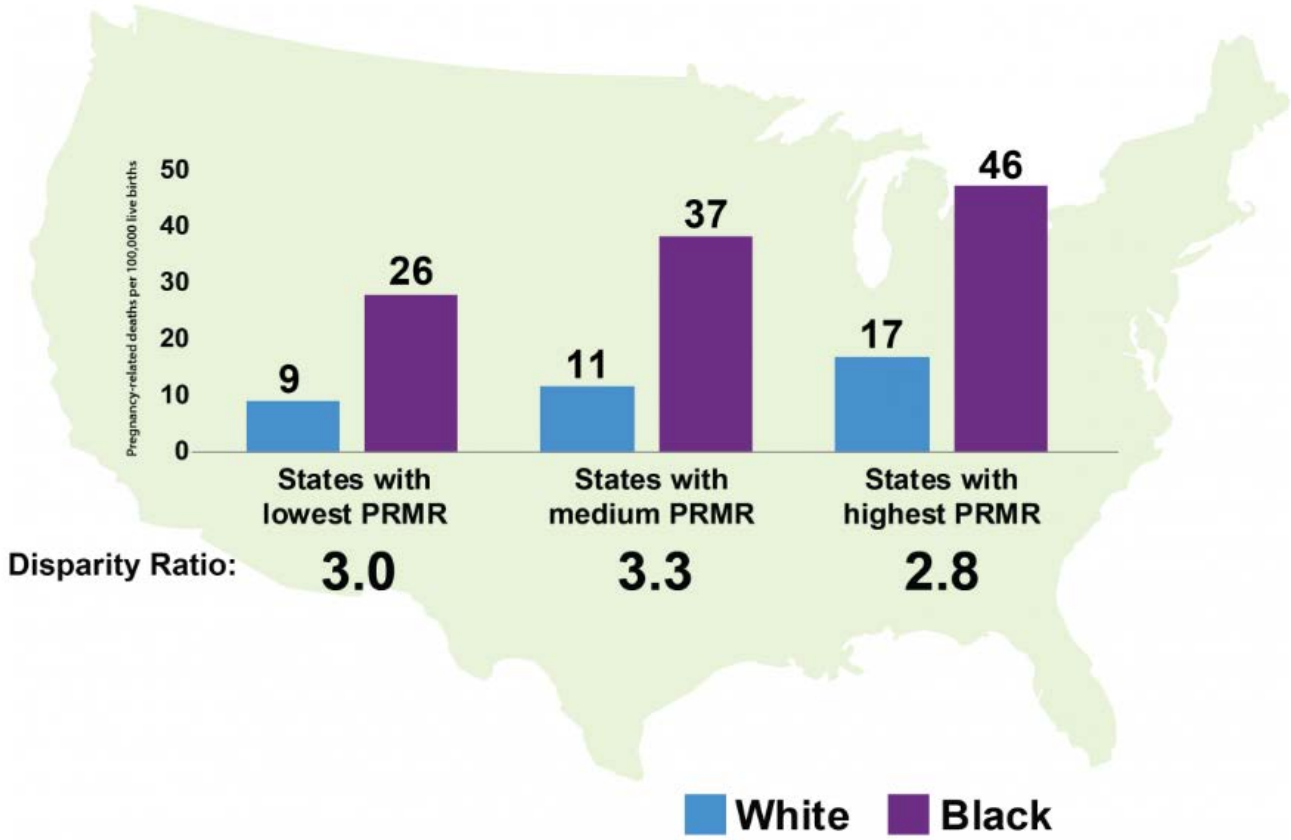


Source: Petersen EE, et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016. MMWR Morb Mortal Wkly Rep 2019;68:762–765.

DISPARITIES IN MATERNAL MORTALITY BY RACE AND EDUCATION



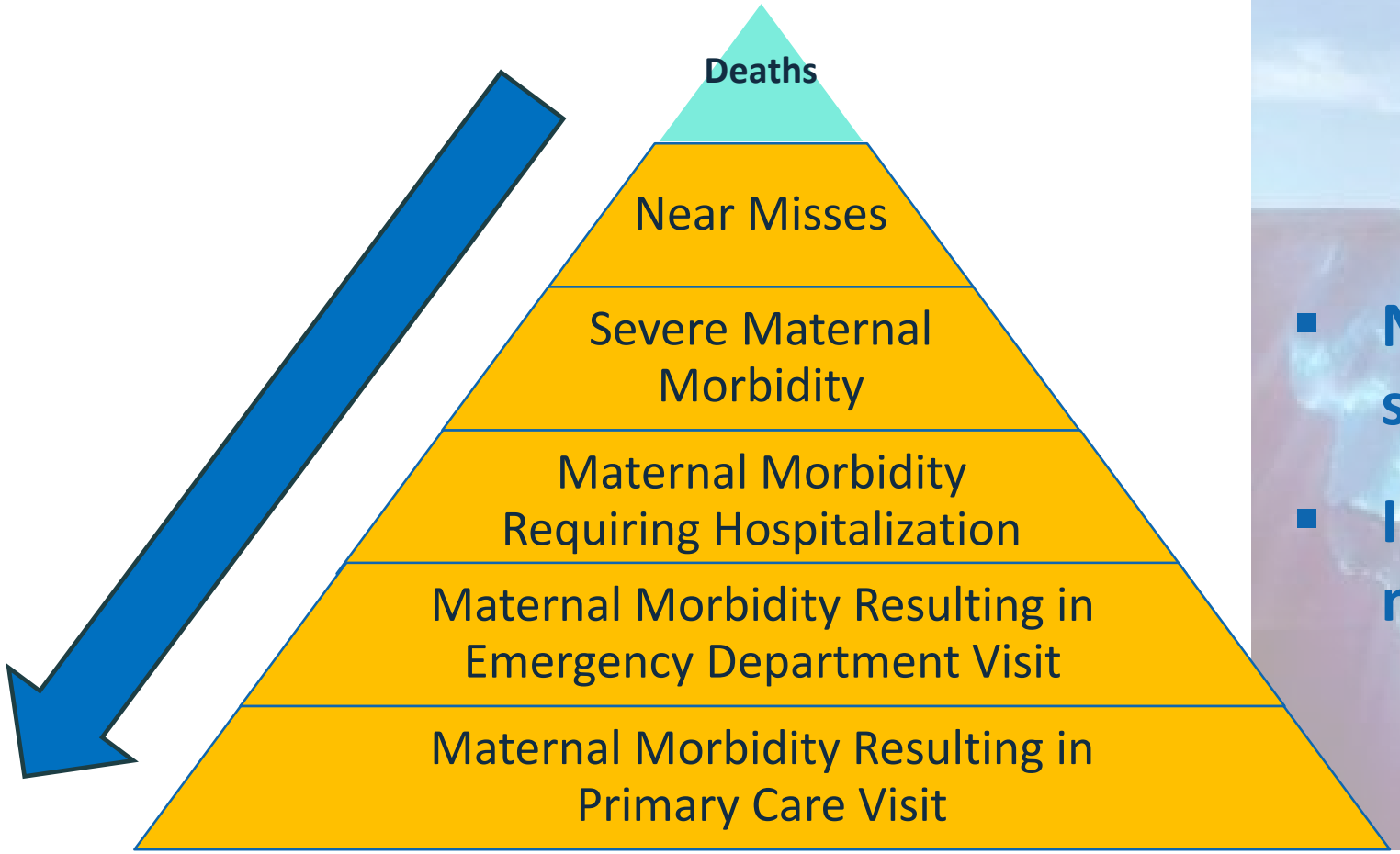
REGARDLESS OF A STATE'S OVERALL RATIO THERE IS A NEED TO ADDRESS DISPARITIES



PRMR: Pregnancy-related mortality ratio

Source: Petersen EE, et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016. MMWR Morb Mortal Wkly Rep 2019;68:762–765.

MATERNAL MORTALITY IS THE TIP OF THE ICEBERG



LEADING CAUSES OF DEATH ARE LINKED TO SEVERE MORBIDITIES

- Severe maternal morbidity includes unexpected outcomes of labor and delivery that result in significant short- and long-term consequences to a women's health
- Severe maternal morbidity is increasing
  - Maternal age
  - Pre-pregnancy obesity
  - Pre-existing chronic medical conditions
- Increased medical costs and hospital stays

SEVERE MATERNAL MORBIDITY INDICATORS

Increased

- Acute myocardial infarction or aneurysm
- Acute renal failure
- Adult respiratory distress syndrome
- Cardiac arrest, fibrillation, or conversion of cardiac rhythm
- Shock
- Ventilation/temporary tracheostomy
- Sepsis
- Hysterectomy
- Blood transfusions

Same or Decreased

- Disseminated intravascular coagulation
- Air and thrombotic embolism
- Amniotic fluid embolism
- Acute congestive heart failure or pulmonary edema
- Puerperal cerebrovascular disorders
- Heart failure or arrest during surgery or procedure
- Eclampsia
- Severe anesthesia complications

Indicators calculated using ICD-9 codes from the Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project

WHAT IS CDC DOING TO HELP PREVENT MATERNAL DEATHS AND COMPLICATIONS OF PREGNANCY?

REVIEW to ACTION
WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

MMRIA
MATERNAL MORTALITY REVIEW INFORMATION APP

NNPQC
National Network of Perinatal Quality Collaboratives

LOCATe℠

IMPROVING THE DATA: REVIEWING MATERNAL DEATHS

- Maternal Mortality Review Committees (MMRCs)
- Review deaths within one year of pregnancy
- Gather data from multiple sources to provide a deeper understanding
- Multidisciplinary review of deaths

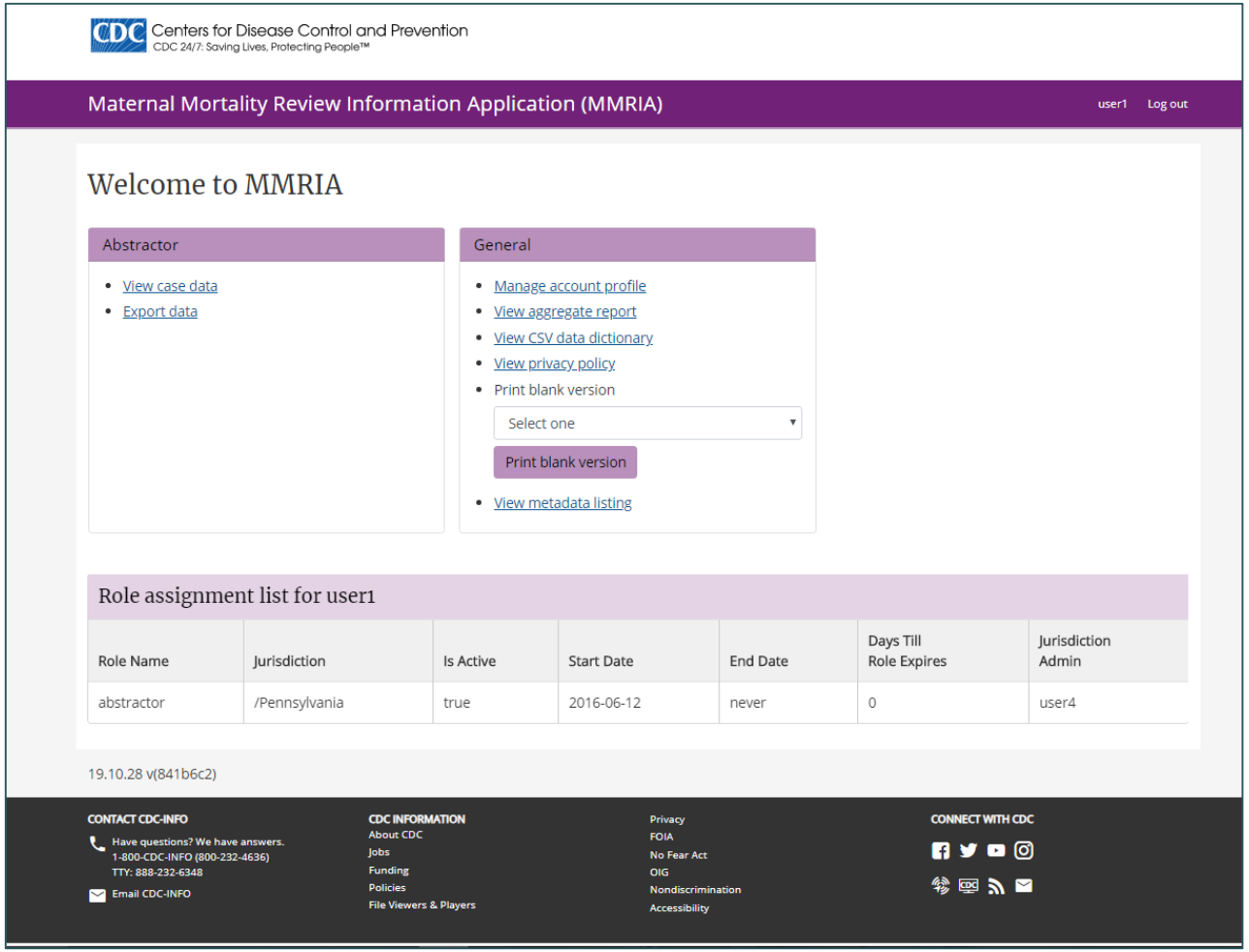
INSIGHT FROM OTHER MORTALITY REVIEW SYSTEMS IMPACTED MMRC DATA PLATFORM DEVELOPMENT

- Fetal and Infant Mortality Review Community Action Teams
- Maternal Mortality Review Information Application (MMRIA) is being used to standardize recommendations from MMRCs
  - MMRIA Designed in partnership with the CDC Foundation
  - Walks a committee through the review process
  - Gathers the documentation, data, and committee decisions
  - Consistent definitions and process allows CDC to bring together data across jurisdictions for a comprehensive picture of the problem

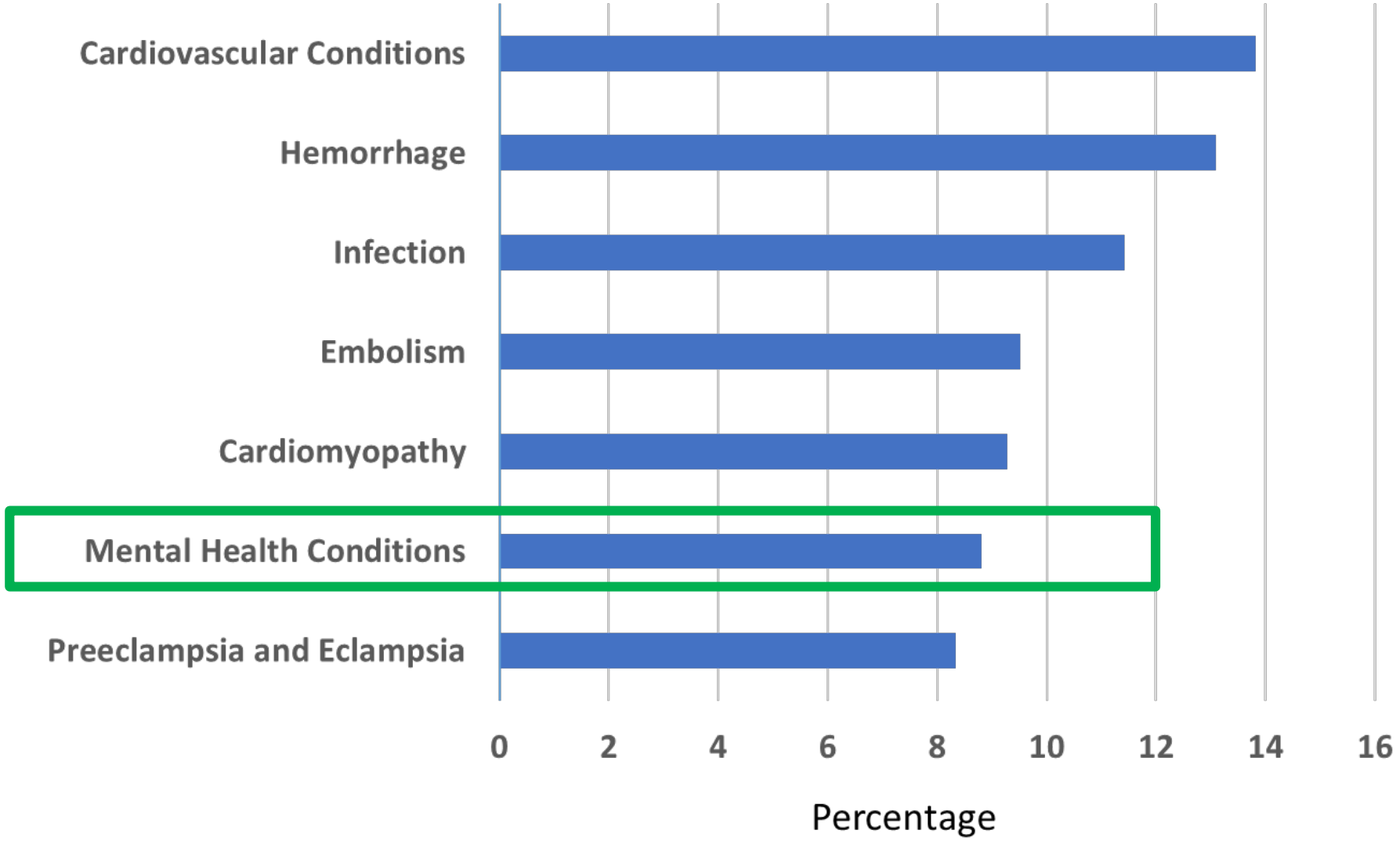
SYSTEMATIC DATA COLLECTION AND USE THROUGH

MMRIA offers platform for comparable data, enables multi-state reporting for national and regional action

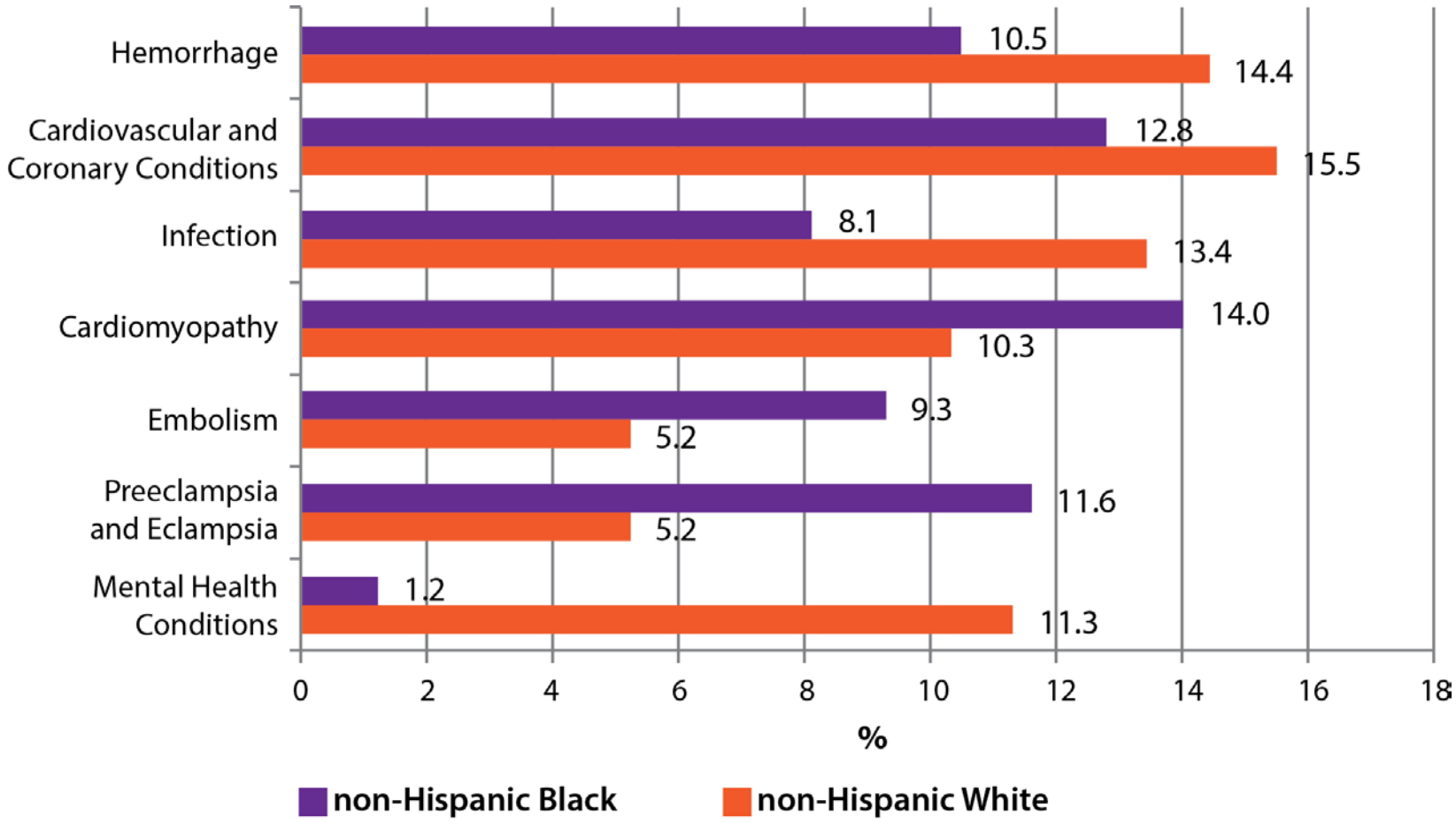
- ✓ CDC provides ongoing training for abstractors, analysts, and committees to use the system
- ✓ Currently finishing the transition to a centrally hosted, CDC system



IMPROVING THE DATA: REVIEWING MATERNAL DEATHS



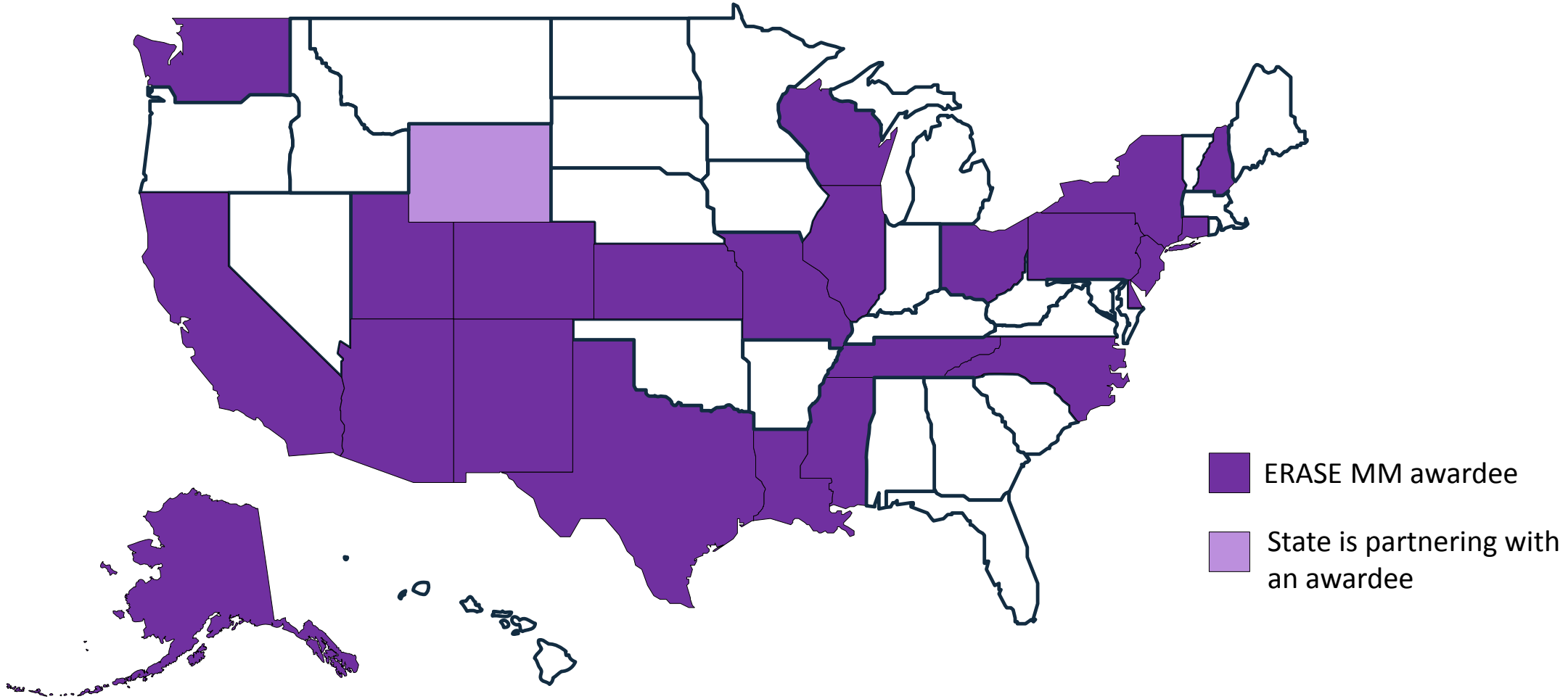
LEADING CAUSE OF PREGNANCY-RELATED DEATHS VARY BY RACE/ETHNICITY



IMPROVING THE DATA: REVIEWING MATERNAL DEATHS

- Expand access to patient navigators, case managers, and peer support
- Implement a maternal early warning system
- Develop policies to ensure pregnant women are transported to a hospital with an appropriate level of maternal care
- Implement obstetric emergency simulation training for emergency department and OB staff members
- Prioritize pregnant and postpartum women for temporary housing programs

ENHANCING REVIEWS AND SURVEILLANCE TO ELIMINATE MATERNAL MORTALITY

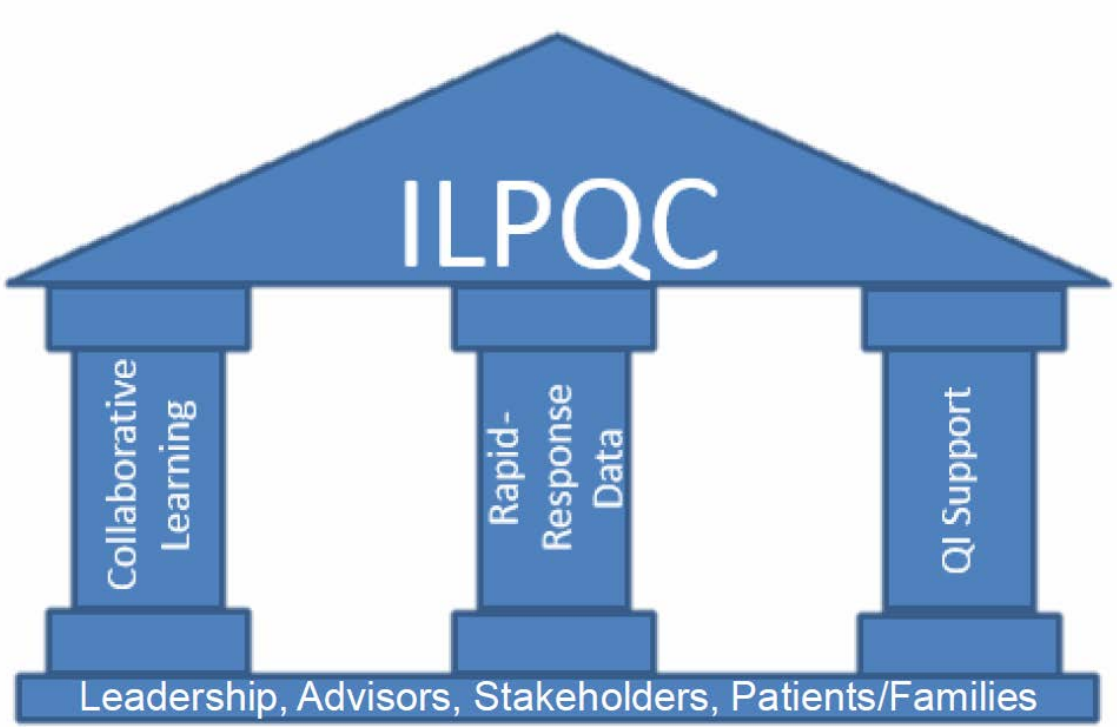


PERINATAL QUALITY COLLABORATIVES (PQCS)

- State or multi-state networks of multidisciplinary teams that are working to improve measurable outcomes for maternal and infant health by
  - Advancing evidence-informed clinical practices and processes using quality improvement (QI) principles.
  - Addressing gaps by working with clinical teams, experts and stakeholders, including patients and families
  - Spreading best practices
  - Reducing variation
  - Optimizing resources to improve perinatal care and outcomes

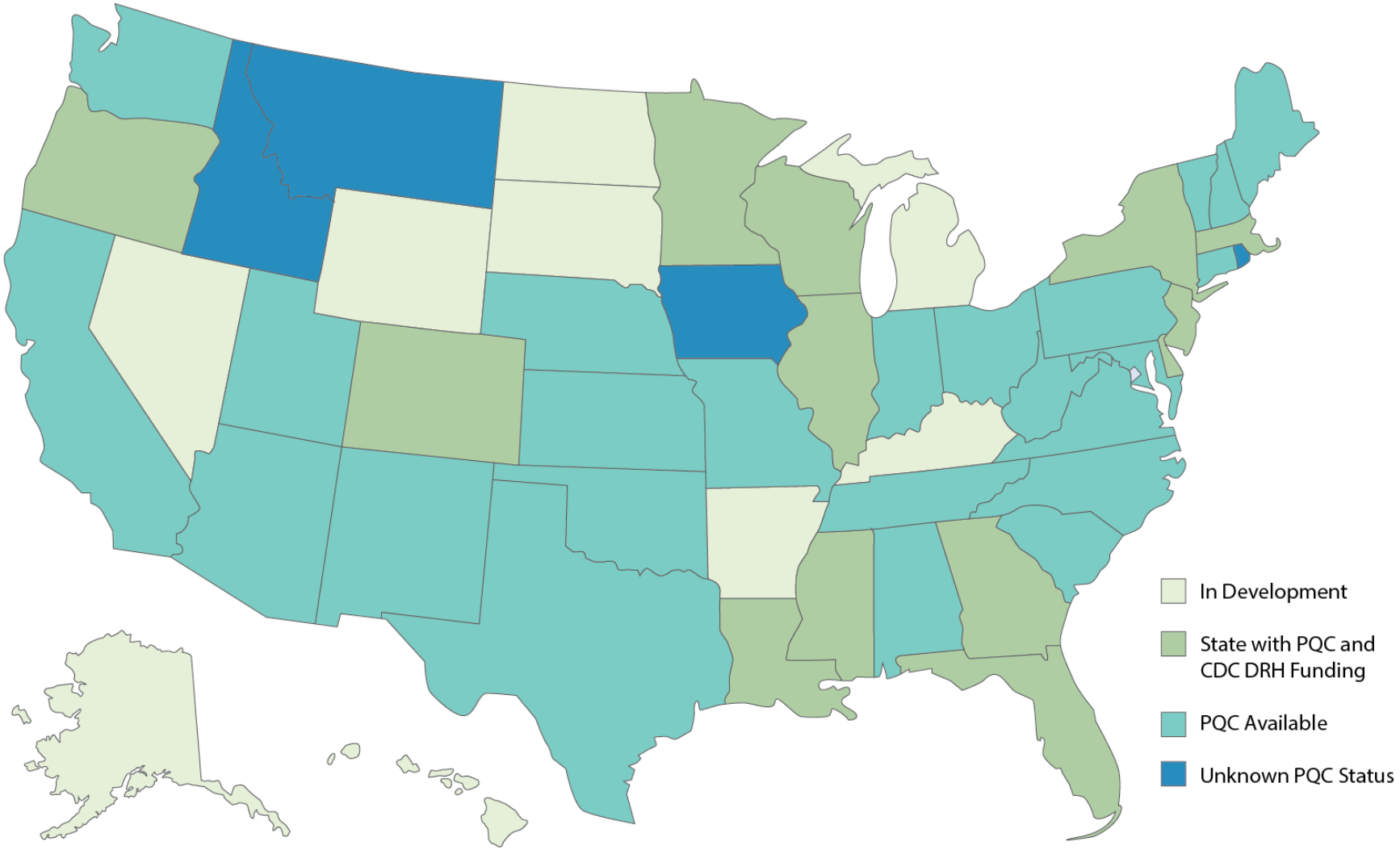
KEY PQC STRATEGIES

- Collaborative learning model
- Rapid-response data for quality improvement
- QI science support and assistance to clinical teams



- Ultimate goal = improvements in population-level outcomes in maternal and infant health

STATUS OF PQCs IN THE UNITED STATES



PQC INITIATIVES

- **Obstetric/Maternal**
  - Reduction of non-medically indicated deliveries <39 weeks gestation
  - Progesterone for prevention of preterm birth
  - Improve response to and management of
    - obstetric hemorrhage
    - hypertensive disorders of pregnancy
  - Maternal substance abuse
  - Reduction of unnecessary cesarean deliveries

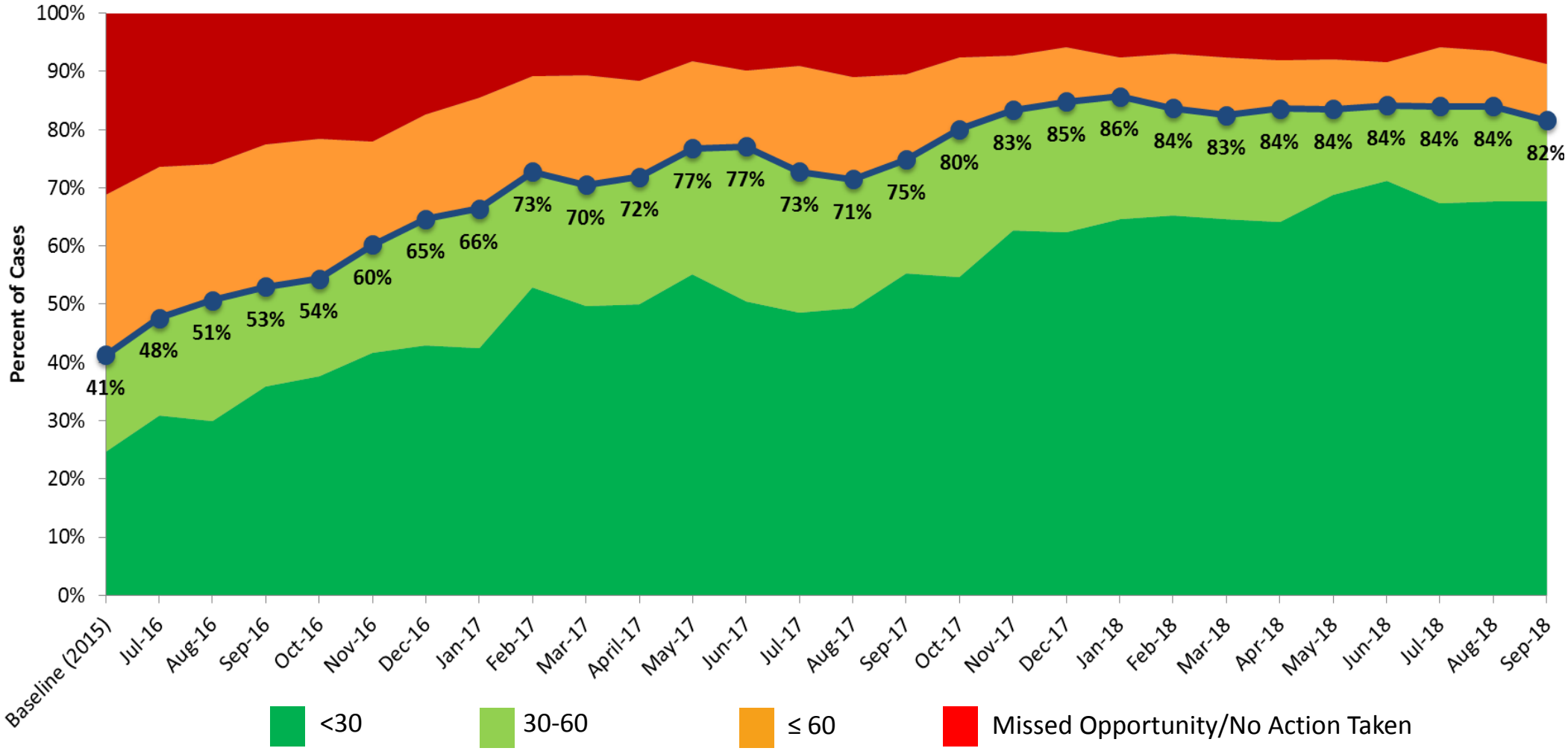
- **Neonatal**
  - Safe Sleep
  - Neonatal Abstinence Syndrome
  - Healthcare-associated infections in newborns
  - Breastfeeding/Human Milk in NICUs

REDUCING MATERNAL MORBIDITY FROM OBSTETRIC HEMORRHAGE CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE

- A statewide initiative to implement maternal safety bundles to reduce severe maternal morbidity from obstetric hemorrhage
- Implementation of the hemorrhage maternal safety bundle was scaled to a large number of hospitals (99 hospitals with 256,541 births)
- Severe maternal morbidity was reduced by 20.8% among hemorrhage patients
- Severe maternal morbidity was reduced by 11.7% among all women giving birth

Source: Main et al. Reduction of severe maternal morbidity from hemorrhage. Am J Obstet Gynecol 2017.

ILLINOIS PERINATAL QUALITY COLLABORATIVE MATERNAL HYPERTENSION INITIATIVE: TIME TO TREATMENT



SEVERE MATERNAL MORBIDITY RATE, DELIVERIES WITH HYPERTENSION, BIRTH CERTIFICATE DATA, ALL ILLINOIS HOSPITALS

Between 2015-Q4 and 2017-Q4, the SMM rate among women experiencing hypertension at delivery was cut in half.

Source: A Borders, ILPQC

CDC LOCATE

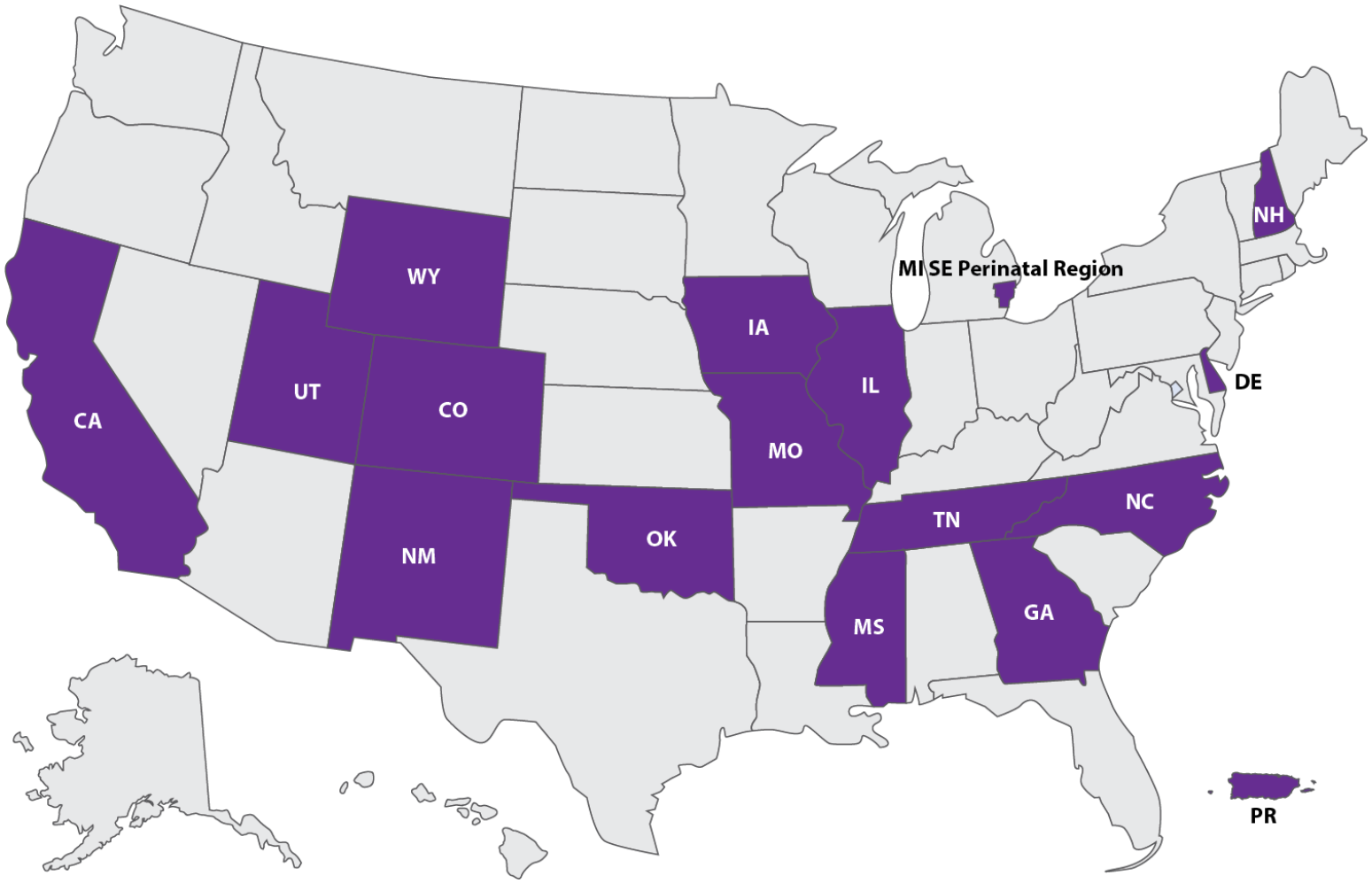
- Created based on need identified by states working in risk-appropriate care
- Produces standardized maternal and neonatal level of care assessments for birth facilities
- CDC provides results back to state
- Aligns with guidelines[1,2,3] published by ACOG/SMFM* and AAP
- Questions about:
  - Hospital equipment & staffing
  - Sub-specialists & their availability
  - Self-designation of care
  - Volume of procedures
  - Drills & protocols for maternal emergencies
  - Transports & facility-level statistics

[1]Committee on Fetus and Newborn (2012). "Levels of Neonatal Care." Pediatrics 130(3): 587.
[2]Menard, M. Kathryn, et al. "Levels of maternal care." *American Journal of Obstetrics and Gynecology* 212.3 (2015): 259-271.
[3]Kilpatrick, S. J., et al. (2017). Guidelines for perinatal care, Am Acad Pediatrics.

* in process of updating to be consistent with 2019 ACOG/SMFM update

CDC LOCATE JURISDICTIONS*

>800 facilities
17 jurisdictions



*as of June 2019

MATERNAL ASSESSMENT DISCREPANCIES*

Based on the **2015 ACOG/SMFM guidelines** for levels of maternal care, what do you consider your **level of maternal care** to be?

	Self-assessment	LOCATe assessment
< Level I	3%	13%
Level I	27%	36%
Level II	32%	40%
Level III	19%	8%
Level IV	6%	3%
Unknown	14%	-

* Based on data from 767 facilities in 15 jurisdictions

MATERNAL TRANSPORT DATA BY LOCATE LEVEL

Does your facility have a **formal written plan** for **transport of complicated obstetric/maternal patients**?
Yes – 83%

Does this **formal written plan** include…

	Transport out to higher level of care facility	Receive from a lower level of care facility
< Level I	73%	5%
Level I	83%	18%
Level II	75%	29%
Level III	67%	55%
Level IV	48%	64%

REVIEW OF MATERNAL TRANSPORT AND TELEMEDICINE POLICIES

- State transport and telemedicine policy status
  - 60% of states have an established state-level policy for maternal transport
  - 33% of states with a transport policy specify reimbursement for maternal transport
  - 2 states have telemedicine policy language specifying maternal risk-appropriate care
- Interpretation
  - Transport is vital for risk-appropriate care--allows for timely provision of care and continuity of care
  - Telemedicine has transitioned from an innovative way of practicing medicine to a practical and necessary tool in addressing the health care needs of the nation
    - Telehealth consultancy with maternal-fetal medicine specialists offer alternative models for provision of care in remote settings
  - Majority of states have the infrastructure for perinatal telemedicine implementation through established policies addressing the telemedicine areas of *consultation*, *diagnosis,* and *treatment*

Okoroh, Ekwutosi M., Charlan D. Kroelinger, David A. Goodman, Sarah M. Lasswell, Amy M. Williams, and Wanda D. Barfield. United States and Territory Policies Supporting Maternal and Neonatal Transfer: Review of Transport and Reimbursement. *Journal of Perinatology*. 2016; 36.1: 30-34.
Okoroh, Ekwutosi M., Charlan D. Kroelinger, Alexander M. Smith, David A. Goodman, and Wanda D. Barfield. US and Territory Telemedicine Policies: Identifying Gaps in Perinatal Care. *American Journal of Obstetrics and Gynecology*. 2016; 215.6:772e.1-772e.6.

NEONATAL ASSESSMENT DISCREPANCIES

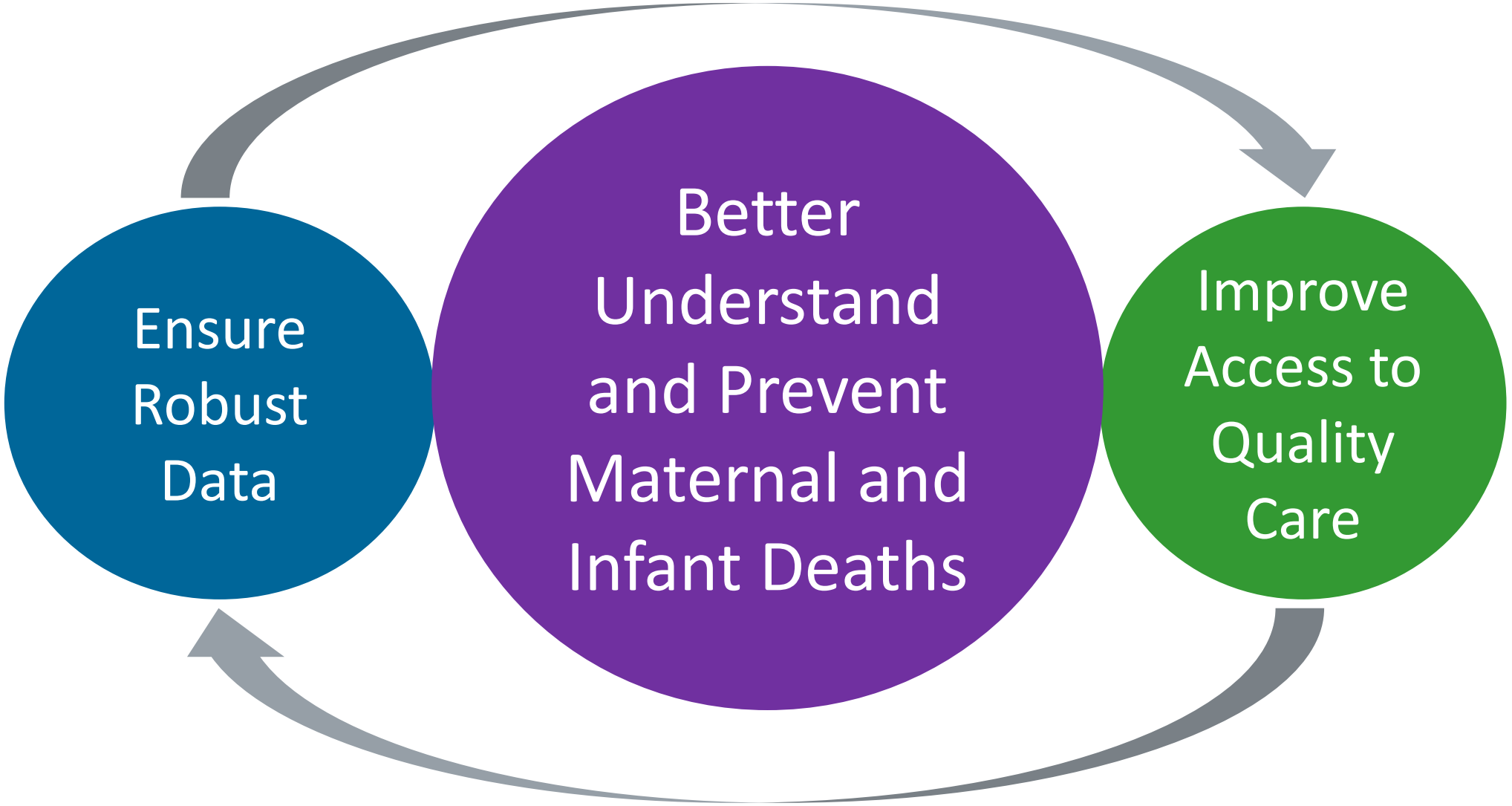
Based on the **2012 AAP guidelines** for neonatal levels of care, what do you consider your **neonatal level of care** to be?

	Self-assessment	LOCATe assessment
Level I	29%	41%
Level II	32%	41%
Level III	21%	14%
Level IV	6%	3%
Unknown	11%	-

NEONATAL TRANSPORT DATA BY LOCATE LEVEL

	Receive complex, high risk neonates	Receive convalescent neonates
Level I	4%	10%
Level II	28%	45%
Level III	88%	70%
Level IV	100%	56%

CDC'S ACTIVITIES TO PREVENT MATERNAL AND INFANT DEATHS



THANK YOU.

QUESTIONS?

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