PRISMA HEALTH℠

Maternal Mortality: Statewide and National Efforts to Reduce Adverse Outcomes of Pregnancy and Childbirth

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Birth Outcomes Initiative Symposium

October 30, 2019

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Disclosures

Chair of the SC Maternal Mortality and Morbidity Review Committee (MMMRC)

SC ACOG Section Chair

Thanks to Dave Goodman, CDC and to Amy Crockett, SC BOI Clinical Lead

Learning Objectives

Understand **the definition of pregnancy-associated and pregnancy-related deaths**

Review **CDC and SC data on maternal mortality**

Describe **ways to decrease maternal mortality and improve racial equity in South Carolina**

Key Definitions

A pregnancy-associated death is the death of a woman (during pregnancy or within one year of pregnancy) that is temporally related to pregnancy.

A pregnancy-related death is a subset of pregnancy-associated deaths that is related to or are aggravated by pregnancy.

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

The Maternal Mortality Rate[1] is reported as

of maternal deaths per 100,000 live births

The Pregnancy-Related Mortality Ratio[2] is reported as

of pregnancy-related deaths per 100,000 live births

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[1]Deaths occurring during pregnancy or within 42 days of delivery. Maternal deaths are identified by ICD-10 codes as listed on the death certificate.

[2] Deaths occurring during pregnancy or within one year of pregnancy. Pregnancy-related deaths are identified by the pregnancy checkbox and/or death certificate linked to fetal deaths or birth certificate.

National Sources for Measuring Maternal Deaths: There are Two

1) National Center for Health Statistics (NCHS)

2) The Pregnancy Mortality Surveillance System (PMSS)

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Measuring Maternal Deaths: NCHS

	CDC – National Center for Health Statistics (NCHS)
Data Source	Death Certificates
Source of Classification	ICD-10 coding

In accordance with international standards: "the death of a woman **while pregnant or within 42 days** of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."

Excluded	*Included: Maternal Mortality Rate*
• O96 (Late maternal deaths) • O97 (Sequelae of direct obstetric causes)	• A34 (obstetric tetanus) • O00–O95 • O98–O99

Hoyert DL. Maternal mortality and related concepts. National Center for Health Statistics. Vital Health Stat 3(33). 2007.

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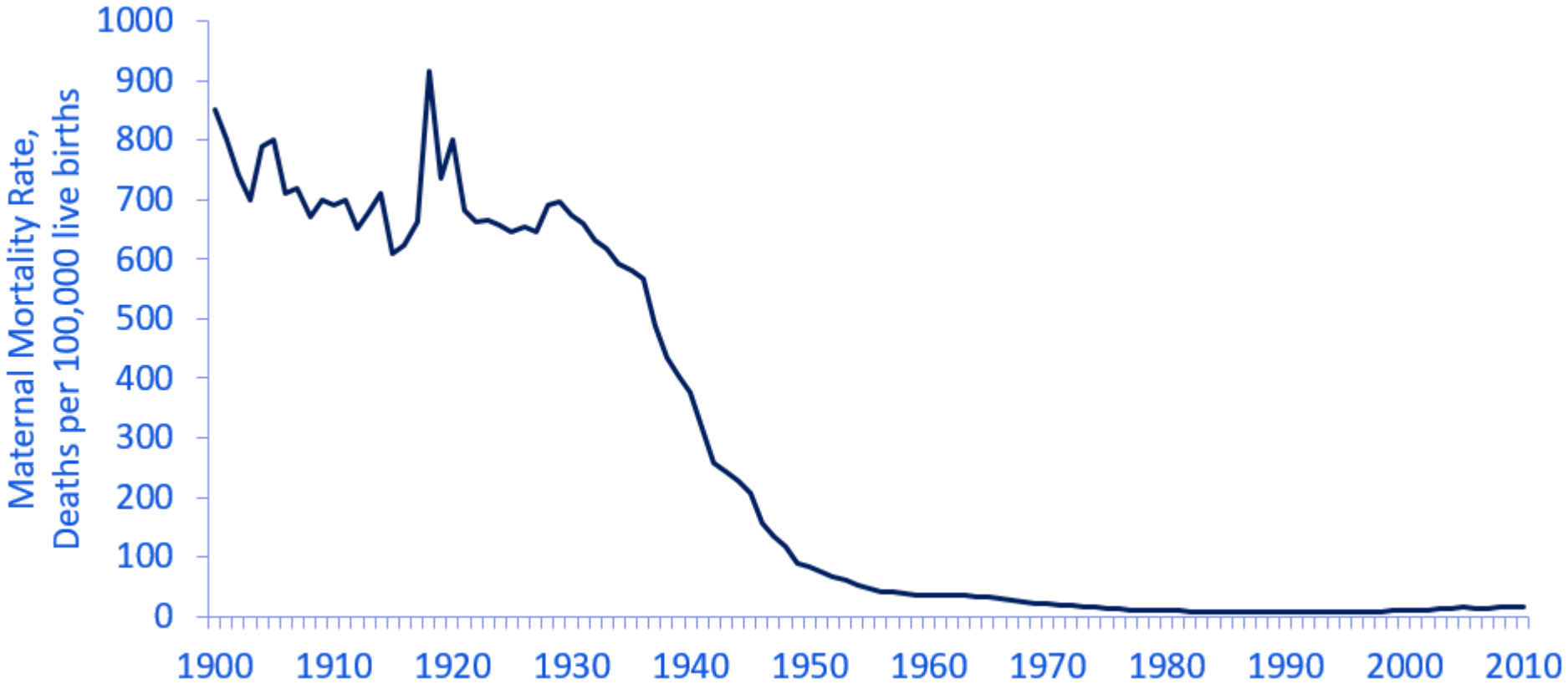
Measuring Maternal Deaths: NCHS

	CDC – National Center for Health Statistics (NCHS)
Data Source	**Death Certificates**
Source of Classification	**ICD-10 coding**
Time Frame	**During pregnancy; up to 42 days**
Terms	**Maternal Death**
Measure	**Maternal Mortality Rate: # of Maternal deaths per 100,000 live births**
Purpose	**Statistical: National trends & international comparison**

Measuring Maternal Deaths: NCHS



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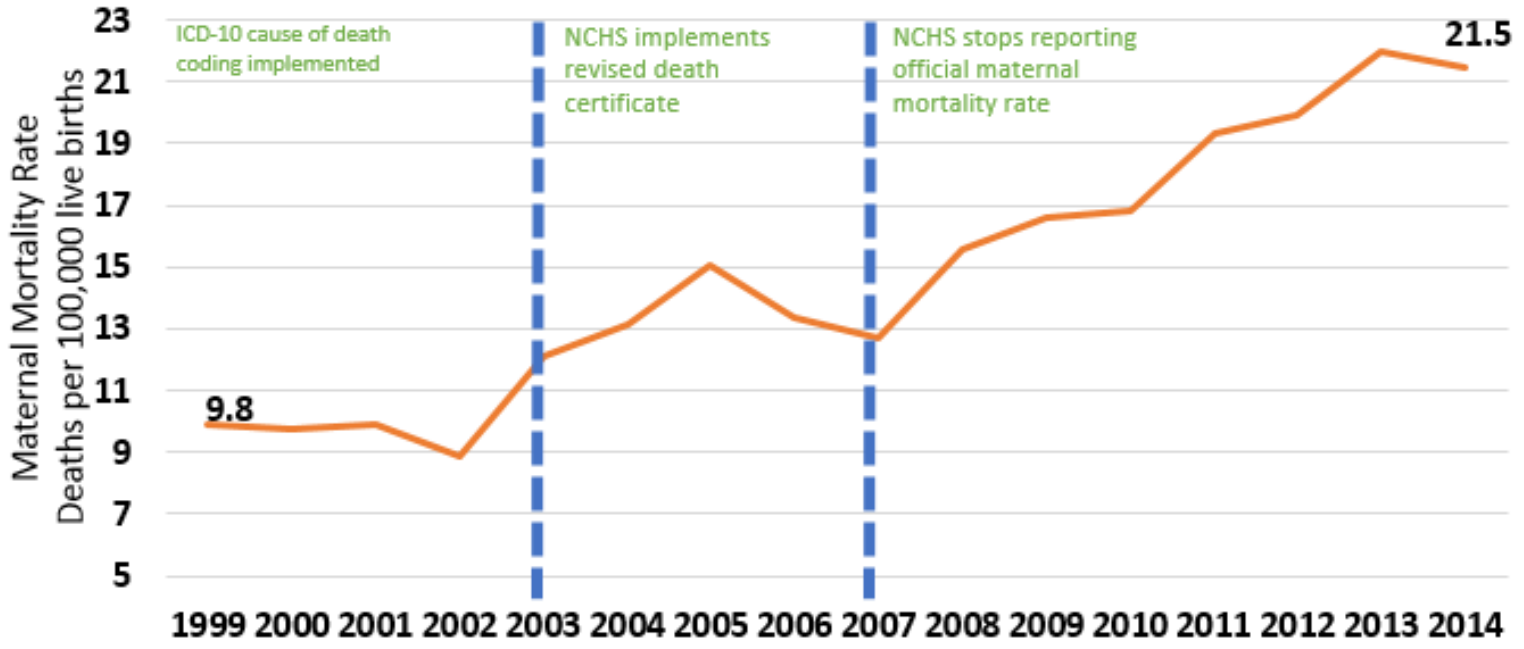
Measuring Maternal Deaths: NCHS



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Measuring Maternal Deaths: Pregnancy Mortality Surveillance System (PMSS)

CDC – ACOG working group (1986)

Clinical relevance instead of rule-based designation of cause of death

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Measuring Maternal Deaths: PMSS

	CDC – National Center for Health Statistics (NCHS)	CDC – Pregnancy Mortality Surveillance System (PMSS)
Data Source	Death Certificates	Death certificates; Linked birth and fetal death certificates; other info sent by jurisdictions

Linkage increases

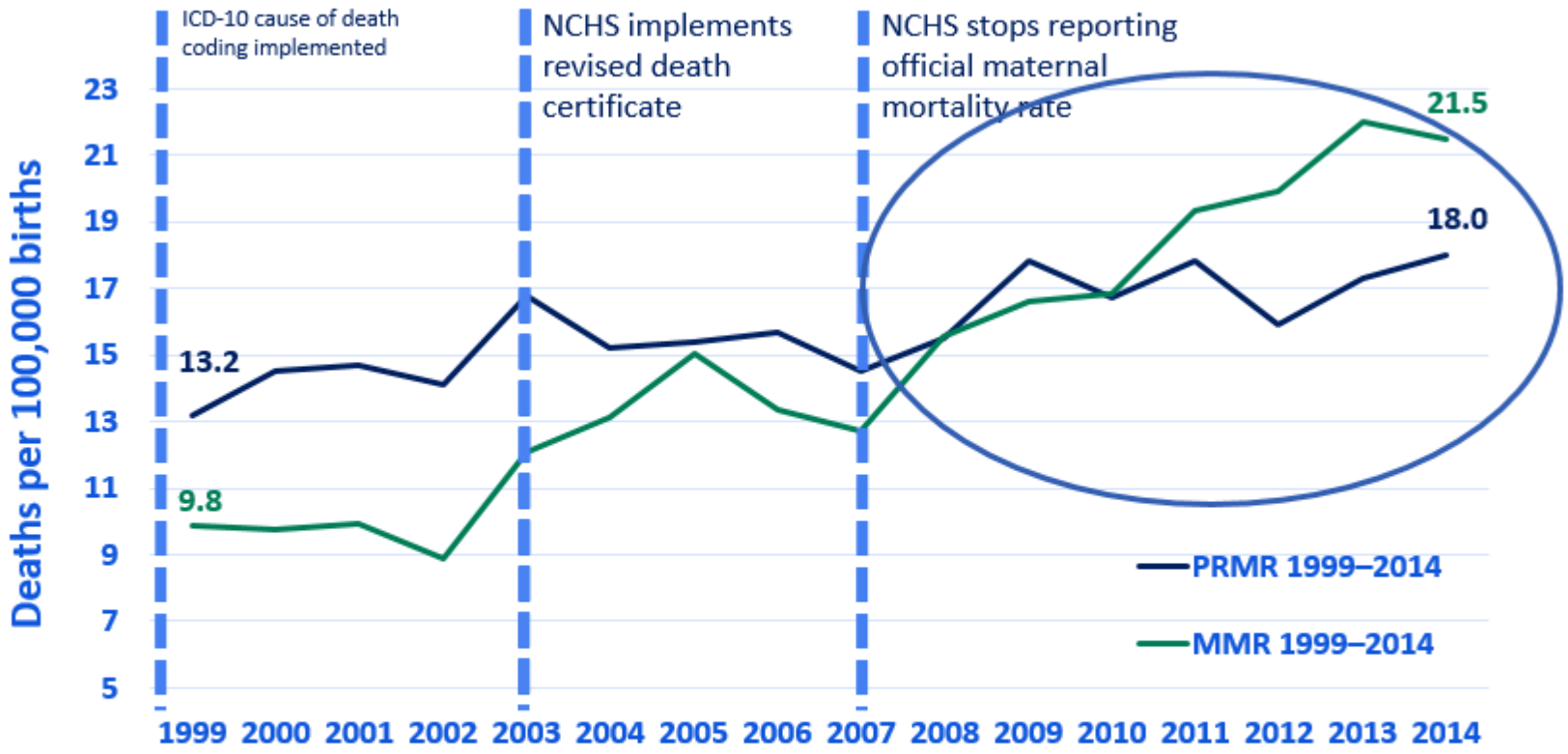
- Identification (40-50%)
- Information available to classify deaths
  - Timing
  - Pregnancy history
  - Health

News articles/obituaries increase information about context

Measuring Maternal Deaths: PMSS

	CDC – National Center for Health Statistics (NCHS)	CDC – Pregnancy Mortality Surveillance System (PMSS)
Data Source	Death Certificates	Death certificates; Linked birth and fetal death certificates; other info sent by jurisdictions
Source of Classification	ICD-10 coding	Clinical epidemiologists
Time Frame	During pregnancy; up to 42 days	During pregnancy; up to 1 year
Measure	Maternal Mortality Rate: # of Maternal deaths per 100,000 live births	Pregnancy-related Mortality Ratio: # of Pregnancy-related Deaths per 100,000 live births
Purpose	Statistical: National trends & international comparison	Analyze clinical factors, publish information that may lead to prevention strategies

Measuring Maternal Deaths: NCHS & PMSS



PRMR: Pregnancy-related mortality ratio
MMR: Maternal mortality rate
http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

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Measuring Maternal Deaths: NCHS & PMSS

PRMR: Pregnancy-related mortality ratio
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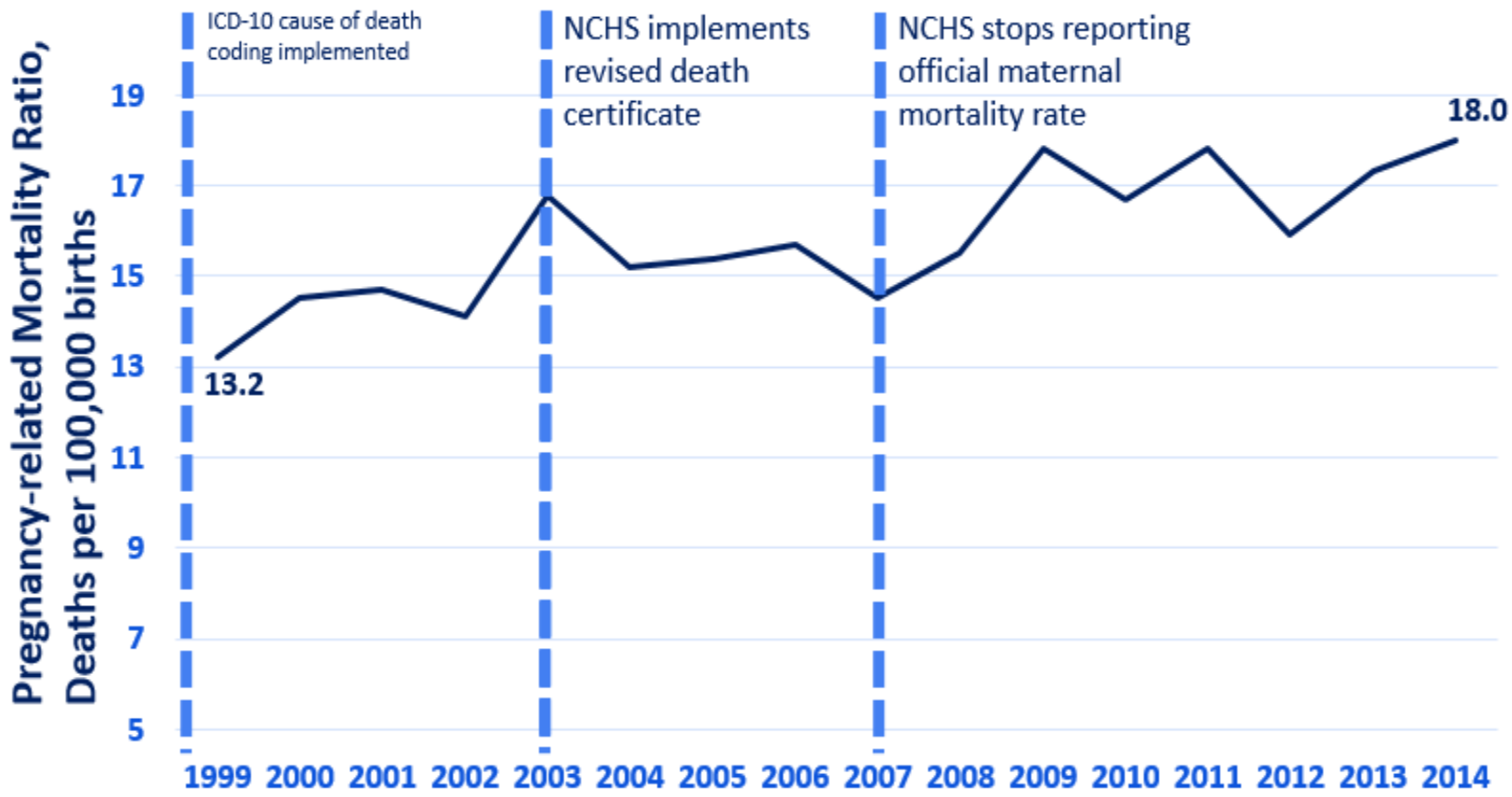
Measuring Maternal Deaths: PMSS



http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

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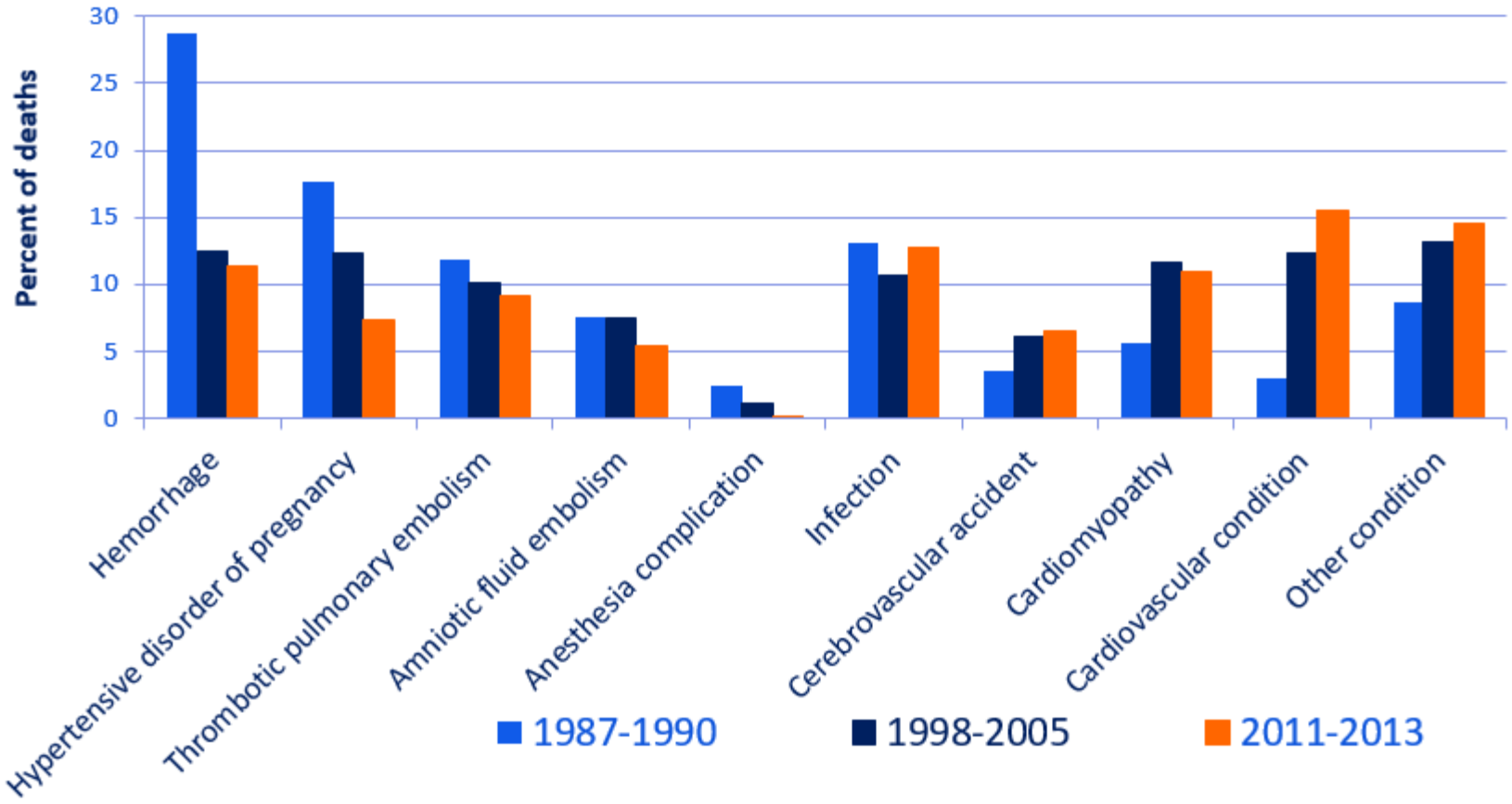
PMSS: Causes of Pregnancy-related Death



Creanga AA, et al. Obstet Gynecol 2015;125:5-12.

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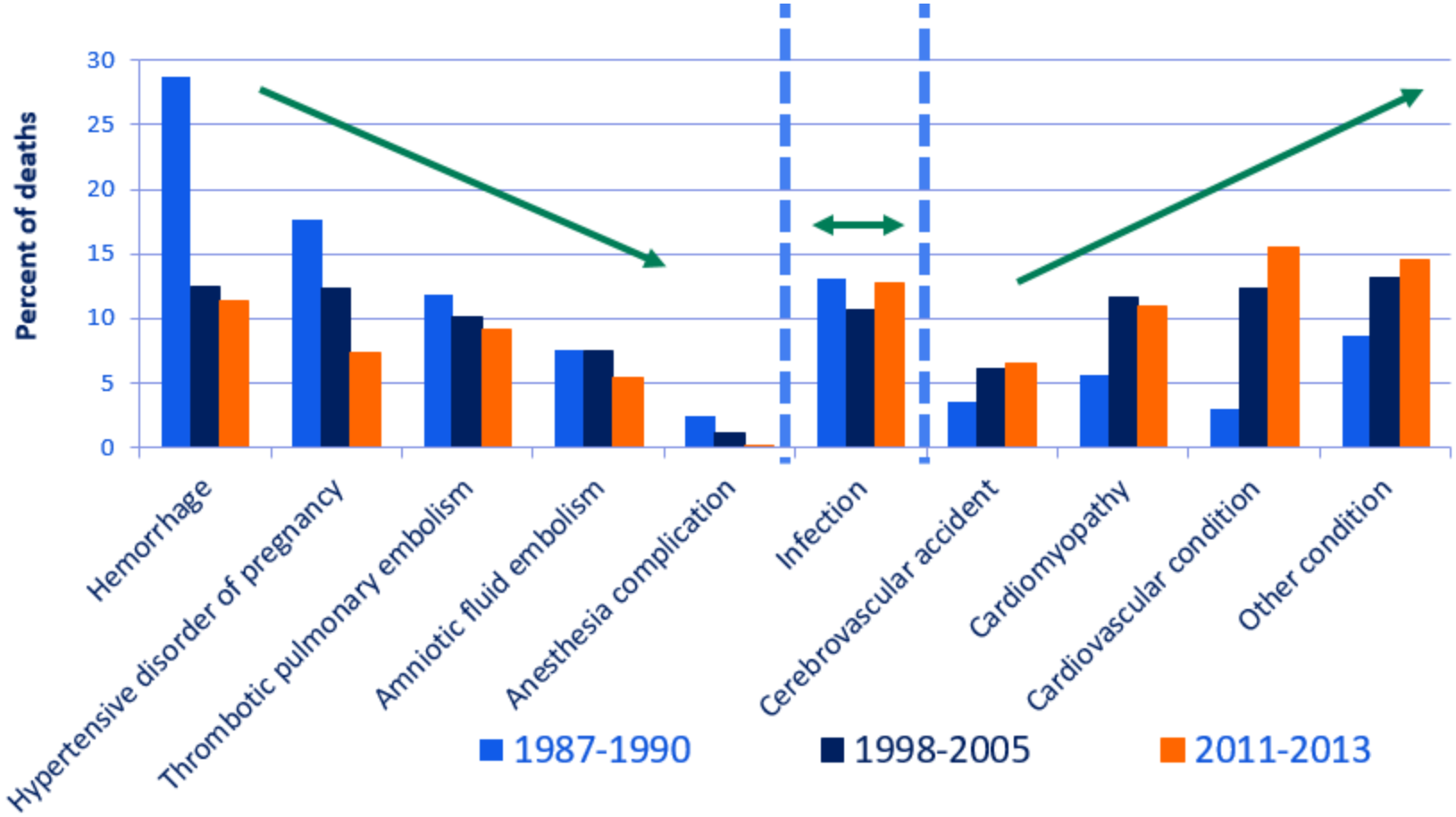
PMSS: Causes of Pregnancy-related Death



Creanga AA, et al. Obstet Gynecol 2015;125:5-12.

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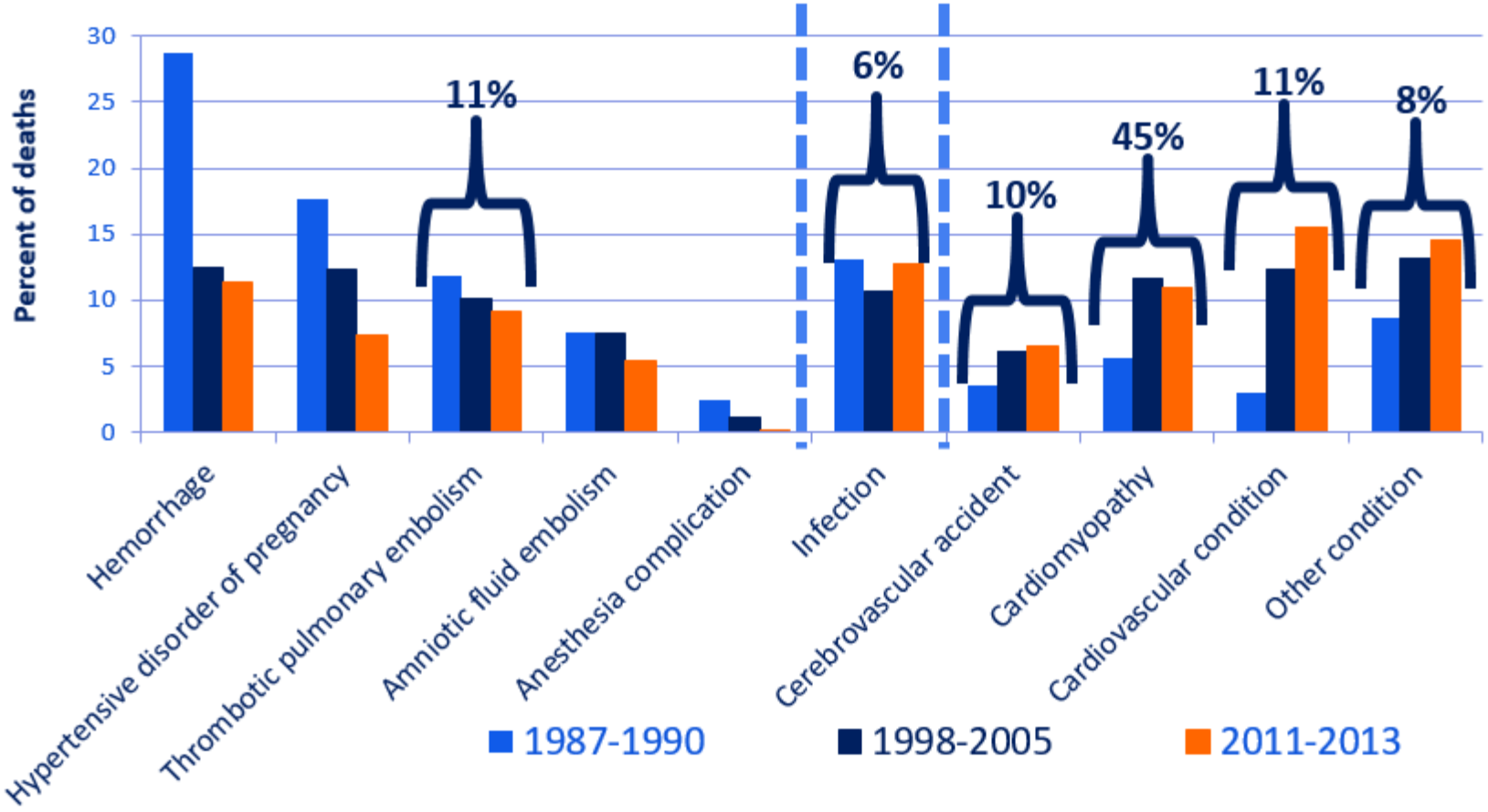
PMSS: Percent >42 days



Creanga AA, et al. Obstet Gynecol 2015;125:5-12.

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Morbidity and Mortality Weekly Report

Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016

Emily E. Petersen, MD[1]; Nicole L. Davis, PhD[1]; David Goodman, PhD[1]; Shanna Cox, MSPH[1]; Carla Syverson, MSN[1,2]; Kristi Seed[1,2]; Carrie Shapiro-Mendoza, PhD[1]; William M. Callaghan, MD[1]; Wanda Barfield, MD[1]

Approximately 700 women die in the United States each year a result of pregnancy or its complications, and significant ial/ethnic disparities in pregnancy-related mortality exist (*1*). ta from CDC's Pregnancy Mortality Surveillance System MSS) for 2007–2016 were analyzed. Pregnancy-related rtality ratios (PRMRs) (i.e., pregnancy-related deaths per

chain of events initiated by pregnancy, or aggravation of an unrelated condition by the physiologic effects of pregnancy. U.S. natality files were the source of live birth data (*3*).

PRMRs were analyzed by age group, highest level of education, and calendar year for women who were non-Hispanic white, black, AI/AN, Asian or Pacific Islander (A/PI), and

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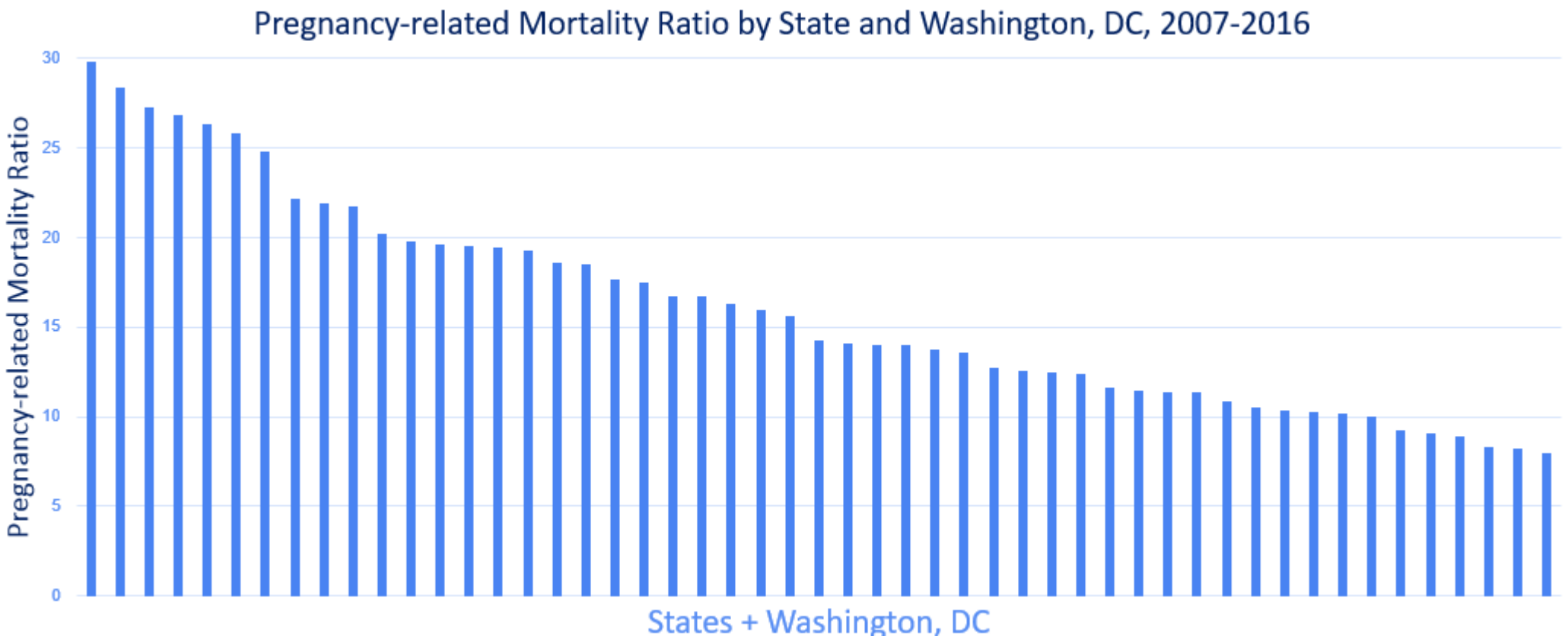
PMSS: State Variation



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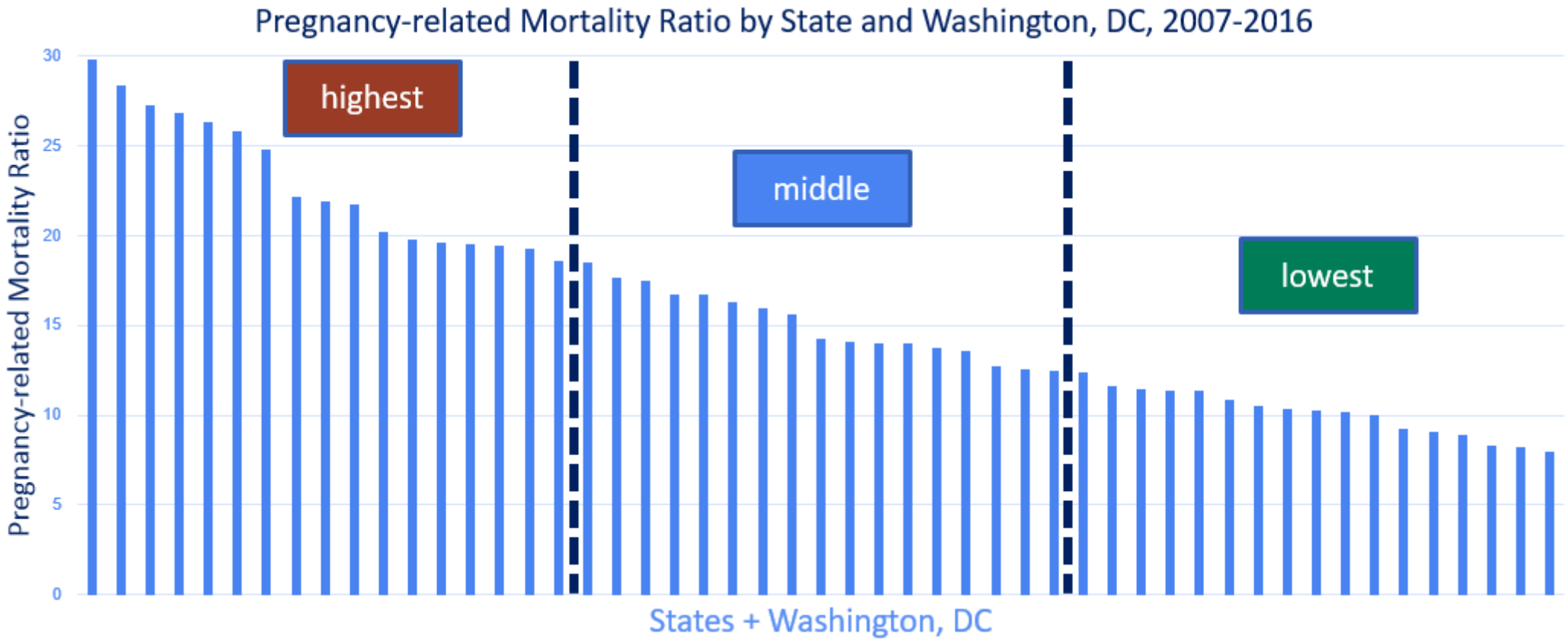
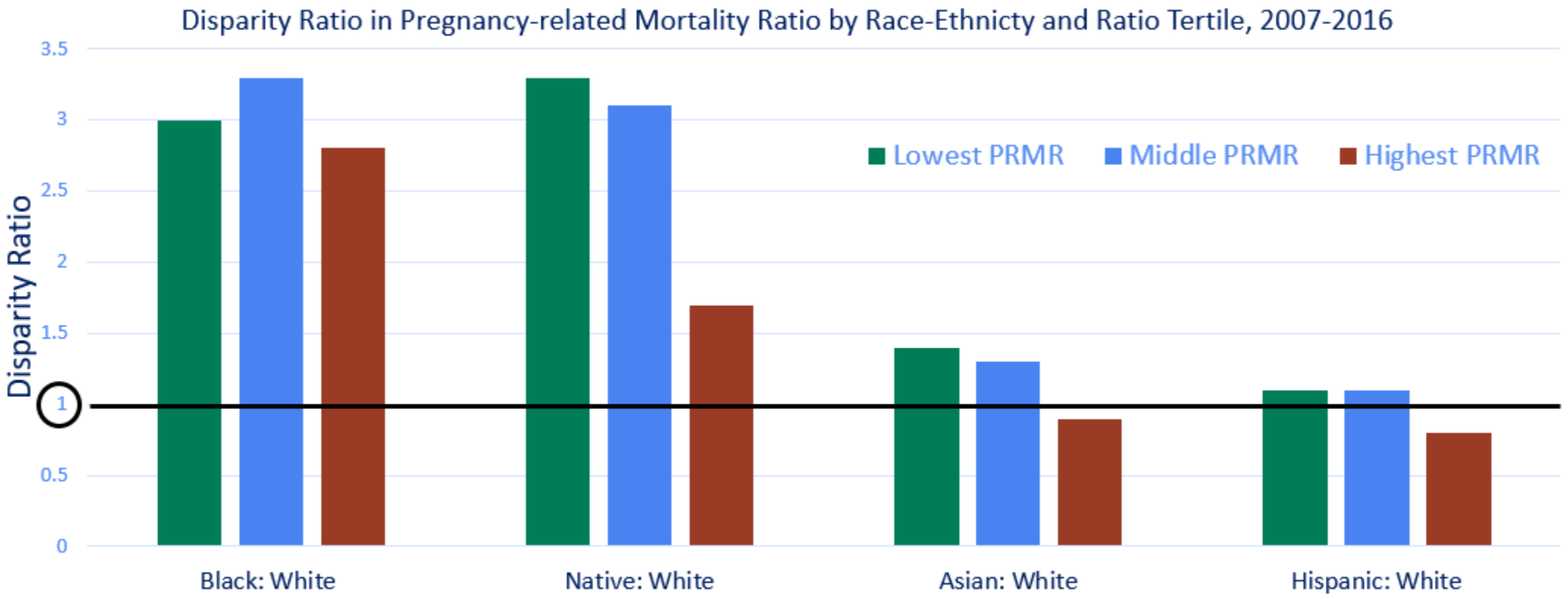
PMSS: State Variation



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

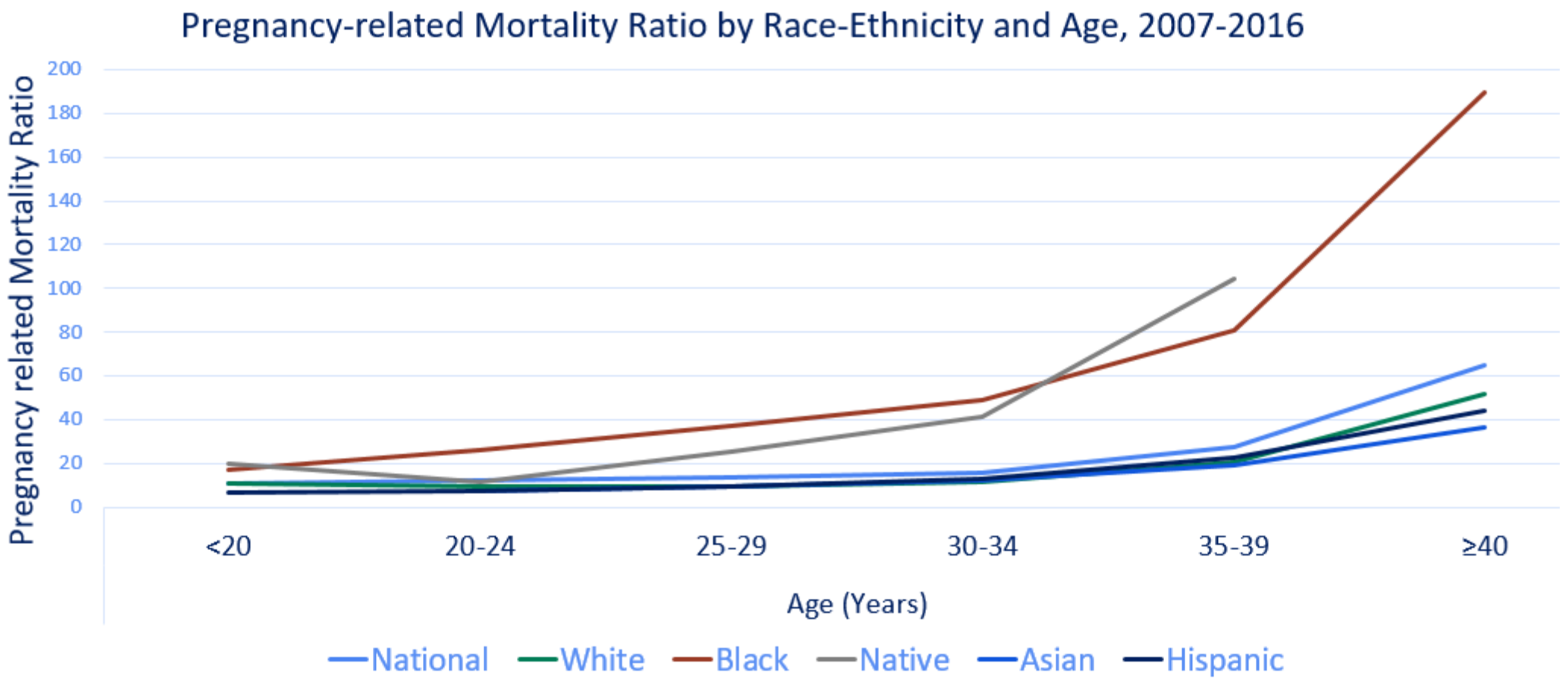
Disparity implies inequality often where a greater equality might b reasonably expected

PMSS: Disparity Ratio by Tertile



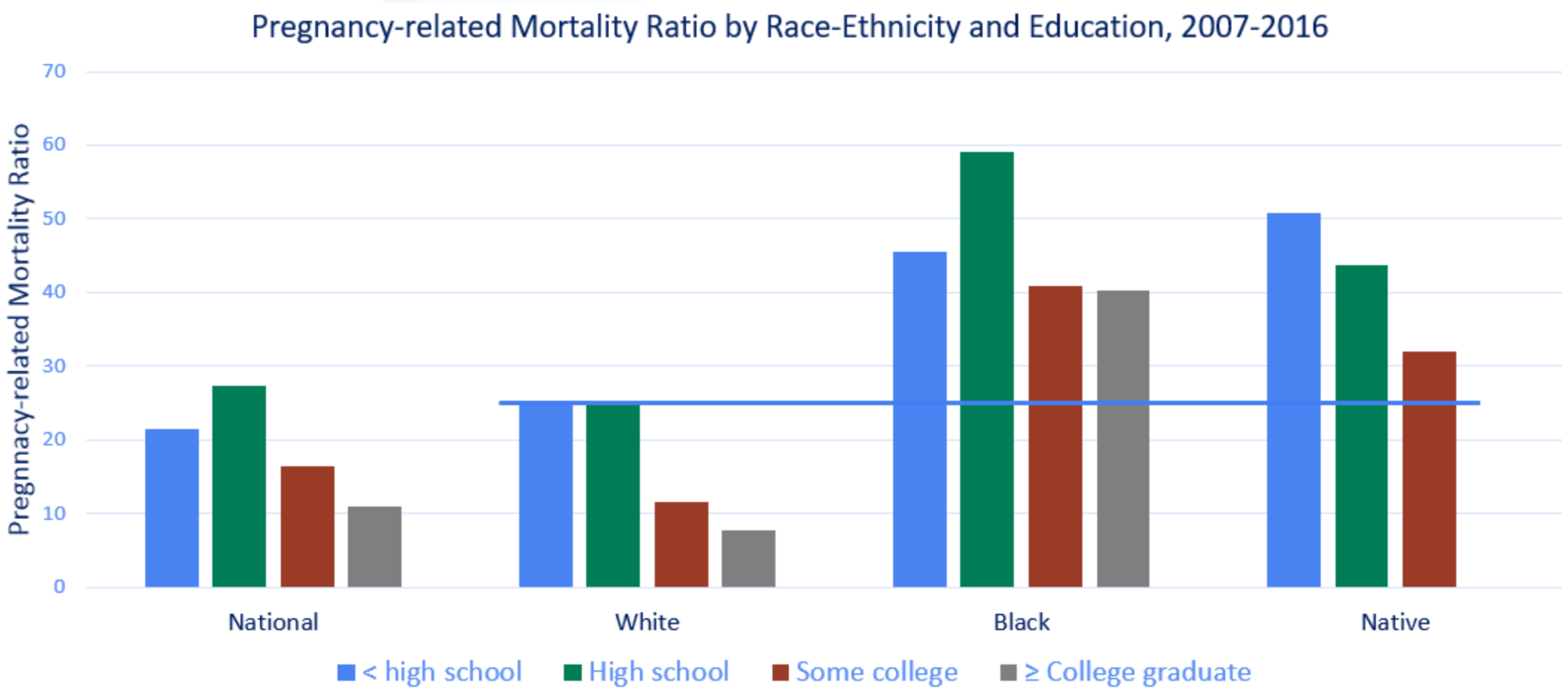
Petersen EE, Davis NL, Goodman D, et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016. MMWR Morb Mortal Wkly Rep 2019;68:762–765

PMSS: by Age Grouping



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

PMSS: by Education Grouping



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

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Preventing Maternal Deaths:
Maternal Mortality Review Committees (MMRCs)

Preventing Maternal Deaths: Maternal Mortality Review Committees (MMRCs)

MMRCs have 3 components that the other systems (NCHS and PMSS) don't have:

1. Robust **DATA** system dedicated to maternal mortality with multi-level data from multiple sources (including non-traditional sources)

2. A multidisciplinary committee of **EXPERTS** to review each death, through clinical and non-clinical lens, with a focus on prevention (population level)

3. PH **STAFF (**usually a state department of public health team) to gather and manage the data, establish and guide the committee, communicate with stakeholders, and conduct and disseminate research and surveillance. (AKA, put it all together)

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Preventing Maternal Deaths: Experts

Organizations

- Academic Institutions
- Behavioral Health Agencies
- Blood Banks
- Consumer Advocacy
- Federally Qualified Health Centers
- Fetal and Infant Mortality Review (FIMR) Programs
- Healthy Start Agencies
- Homeless Services
- Hospitals/Hospital Associations
- Private and Public Insurers
- Professional Assoc. State Chapters
- Rural Health Associations
- State Medical Society
- State Medicaid Agency
- State Title V Program
- Tribal Organizations
- Violence Prevention Agencies
- State Title X Program

Core Disciplines

- Anesthesiology
- Family Medicine
- Forensic Pathology
- Maternal Fetal Medicine Perinatology
- Nurse Midwifery
- Obstetrics and Gynecology
- Patient Safety
- Perinatal Nursing
- Psychiatry
- Public Health
- Social Work

Specialty Disciplines

- Clergy
- Community Leadership
- Critical Care Medicine
- Nutrition
- Emergency Response
- Epidemiology
- Genetics
- Home Nursing
- Law Enforcement
- Mental Health Provider
- Pharmacy
- Public Health Nursing
- Quality/Risk Management
- Substance Abuse Counseling

Expanded Data +

Multidisciplinary Committee =

Expanded Scope:
Suicide
Homicide
Overdose

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ERASE MM Enhancing Reviews and Surveillance to Eliminate Maternal Mortality

REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

Preventing Maternal Deaths Committee reporting forms MMRIA

REVIEW DATE

RECORD ID #

PREGNANCY-RELATEDNESS: SELECT ONE

- ☐ **PREGNANCY-RELATED**
  The death of a woman during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy
- ☐ **PREGNANCY-ASSOCIATED, BUT NOT -RELATED**
  The death of a woman during pregnancy or within one year of the end of pregnancy from a cause that is not related to pregnancy
- ☐ **UNABLE TO DETERMINE IF PREGNANCY-RELATED OR PREGNANCY-ASSOCIATED, BUT NOT -RELATED**
- ☐ **NOT PREGNANCY-RELATED OR -ASSOCIATED**
  (i.e. false positive, woman was not pregnant within one year of her death)

ESTIMATE THE DEGREE OF RELEVANT INFORMATION (RECORDS) AVAILABLE FOR THIS CASE:

- ☐ **COMPLETE**
  All records necessary for adequate review of the case were available
- ☐ **MOSTLY COMPLETE**
  Minor gaps (i.e. information that would have been beneficial but was not essential to the review of the case)
- ☐ **SOMEWHAT COMPLETE**
  Major gaps (i.e. information that would have been crucial to the review of the case)
- ☐ **NOT COMPLETE**
  Minimal records available for review (i.e. death certificate and no additional records)
- ☐ **N/A**

DOES THE COMMITTEE AGREE WITH THE UNDERLYING CAUSE OF DEATH LISTED ON DEATH CERTIFICATE? ☐ YES ☐ NO

COMMITTEE DETERMINATION OF CAUSE(S) OF DEATH

TYPE	CAUSE (DESCRIPTIVE)
IMMEDIATE	
CONTRIBUTING	
UNDERLYING	
OTHER SIGNIFICANT	

IF PREGNANCY-RELATED, COMMITTEE DETERMINATION OF UNDERLYING CAUSE OF DEATH
Refer to page 3 for PMSS-MM cause of death list. If more than one is selected, list in order of importance beginning with the most compelling (1-2; no more than 2 may be selected in the system).

DID **OBESITY** CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
DID **MENTAL HEALTH CONDITIONS** CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
DID **SUBSTANCE USE DISORDER** CONTRIBUTE TO THE DEATH?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
WAS THIS DEATH A **SUICIDE**?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN
WAS THIS DEATH A **HOMICIDE**?	☐ YES	☐ PROBABLY	☐ NO	☐ UNKNOWN

IF HOMICIDE, SUICIDE, OR ACCIDENTAL DEATH, 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

COMMITTEE DETERMINATION OF PREVENTABILITY

A death is considered preventable if the committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system and/or community factors.

WAS THIS DEATH PREVENTABLE? ☐ YES ☐ NO

CHANCE TO ALTER OUTCOME? ☐ GOOD CHANCE ☐ SOME CHANCE ☐ NO CHANCE ☐ UNABLE TO DETERMINE

CONTRIBUTING FACTORS WORKSHEET

What were the factors that contributed to this death? Multiple contributing factors may be present at each level.

CONTRIBUTING FACTOR LEVEL	CONTRIBUTING FACTOR AND DESCRIPTION OF ISSUE
PATIENT/FAMILY	
PROVIDER	
FACILITY	
SYSTEM	
COMMUNITY	

RECOMMENDATIONS OF THE COMMITTEE

If there was at least some chance that the death could have been averted, what were the specific and feasible actions that, if implemented or altered, might have changed the course of events?

RECOMMENDATIONS OF THE COMMITTEE	LEVEL OF PREVENTION (SEE BELOW)	LEVEL OF IMPACT (SEE BELOW)

CONTRIBUTING FACTOR KEY (DESCRIPTIONS ON PAGE 4)

- Delay
- Adherence
- Knowledge
- Cultural/religious
- Environmental
- Violence
- Mental health conditions
- Substance use disorder - alcohol, illicit/prescription drugs
- Tobacco use
- Chronic disease
- Childhood abuse/ trauma
- Access/financial
- Unstable housing
- Social support/ isolation
- Equipment/ technology
- Policies/procedures
- Communication
- Continuity of care/ care coordination
- Clinical skill/ quality of care
- Outreach
- Enforcement
- Referral
- Assessment
- Legal
- Other

PREVENTION LEVEL

- **PRIMARY:** Prevents the contributing factor before it ever occurs
- **SECONDARY:** Reduces the impact of the contributing factor once it has occurred (i.e. treatment)
- **TERTIARY:** Reduces the impact or progression of an ongoing contributing factor once it has occurred (i.e. management of complications)

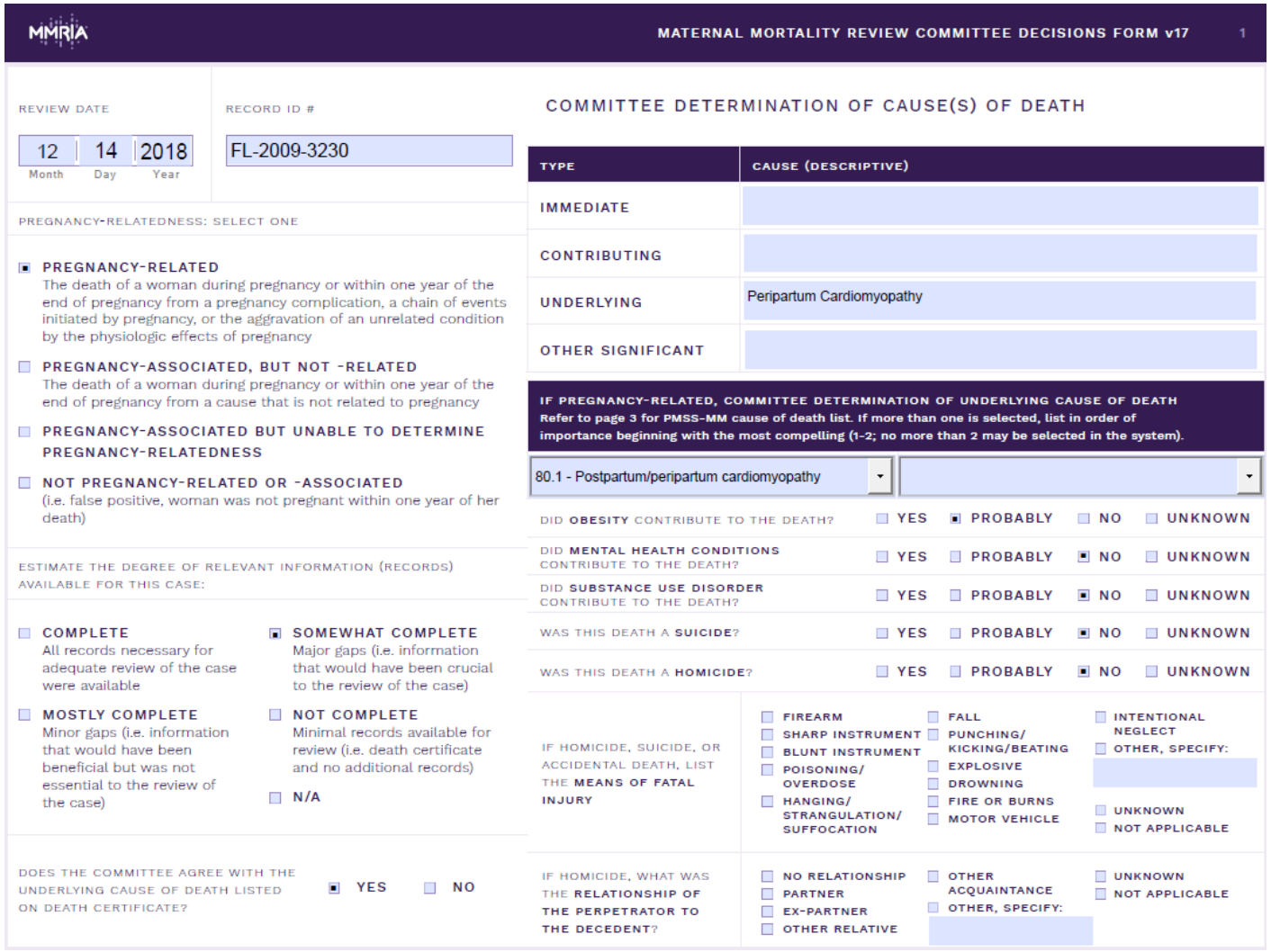
EXPECTED IMPACT LEVEL

- **SMALL:** Education/counseling (community- and/or provider-based health promotion and education activities)
- **MEDIUM:** Clinical intervention and coordination of care across continuum of well-woman visits through obstetrics (protocols, prescriptions)
- **LARGE:** Long-lasting protective intervention (improve readiness, recognition and response to obstetric emergencies/LARC)
- **EXTRA LARGE:** Change in context (promote environments that support healthy living/ensure available and accessible services)
- **GIANT:** Address social determinants of health (poverty, inequality, etc.)

MMRC Example: A Cardiomyopathy Death

- Prenatal care
- Intrapartum and postpartum care
- Any postpartum visits
- Informant (family interviews)
- Social determinants of health
- Demographics

MMRC Example: A Cardiomyopathy Death



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MATERNAL MORTALITY REVIEW COMMITTEE DECISIONS FORM v17 1

REVIEW DATE: 12 (Month) 14 (Day) 2018 (Year)

RECORD ID #: FL-2009-3230

PREGNANCY-RELATEDNESS: SELECT ONE

- [x] **PREGNANCY-RELATED** — The death of a woman during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy
- [ ] **PREGNANCY-ASSOCIATED, BUT NOT -RELATED** — The death of a woman during pregnancy or within one year of the end of pregnancy from a cause that is not related to pregnancy
- [ ] **PREGNANCY-ASSOCIATED BUT UNABLE TO DETERMINE PREGNANCY-RELATEDNESS**
- [ ] **NOT PREGNANCY-RELATED OR -ASSOCIATED** (i.e. false positive, woman was not pregnant within one year of her death)

ESTIMATE THE DEGREE OF RELEVANT INFORMATION (RECORDS) AVAILABLE FOR THIS CASE:

- [ ] **COMPLETE** — All records necessary for adequate review of the case were available
- [ ] **MOSTLY COMPLETE** — Minor gaps (i.e. information that would have been beneficial but was not essential to the review of the case)
- [x] **SOMEWHAT COMPLETE** — Major gaps (i.e. information that would have been crucial to the review of the case)
- [ ] **NOT COMPLETE** — Minimal records available for review (i.e. death certificate and no additional records)
- [ ] **N/A**

DOES THE COMMITTEE AGREE WITH THE UNDERLYING CAUSE OF DEATH LISTED ON DEATH CERTIFICATE? [x] YES [ ] NO

COMMITTEE DETERMINATION OF CAUSE(S) OF DEATH

TYPE	CAUSE (DESCRIPTIVE)
IMMEDIATE	
CONTRIBUTING	
UNDERLYING	Peripartum Cardiomyopathy
OTHER SIGNIFICANT	

IF PREGNANCY-RELATED, COMMITTEE DETERMINATION OF UNDERLYING CAUSE OF DEATH
Refer to page 3 for PMSS-MM cause of death list. If more than one is selected, list in order of importance beginning with the most compelling (1-2; no more than 2 may be selected in the system).

80.1 - Postpartum/peripartum cardiomyopathy

	YES	PROBABLY	NO	UNKNOWN
DID **OBESITY** CONTRIBUTE TO THE DEATH?	[ ]	[x]	[ ]	[ ]
DID **MENTAL HEALTH CONDITIONS** CONTRIBUTE TO THE DEATH?	[ ]	[ ]	[x]	[ ]
DID **SUBSTANCE USE DISORDER** CONTRIBUTE TO THE DEATH?	[ ]	[ ]	[x]	[ ]
WAS THIS DEATH A **SUICIDE**?	[ ]	[ ]	[x]	[ ]
WAS THIS DEATH A **HOMICIDE**?	[ ]	[ ]	[x]	[ ]

IF HOMICIDE, SUICIDE, OR ACCIDENTAL DEATH, 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

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MMRC Example: A Cardiomyopathy Death

MMRIA — MATERNAL MORTALITY REVIEW COMMITTEE DECISIONS FORM v17 — 2

COMMITTEE DETERMINATION OF PREVENTABILITY

A death is considered preventable if the committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system and/or community factors.

WAS THIS DEATH **PREVENTABLE**?	■ YES	☐ NO
CHANCE TO ALTER OUTCOME?	■ GOOD CHANCE	☐ SOME CHANCE
	☐ NO CHANCE	☐ UNABLE TO DETERMINE

CONTRIBUTING FACTORS WORKSHEET

What were the factors that contributed to this death? Multiple contributing factors may be present at each level.

CONTRIBUTING FACTOR LEVEL	CONTRIBUTING FACTOR (SEE BELOW) AND DESCRIPTION OF ISSUE
PATIENT/FAMILY	Communication: lack of understanding of diagnosis; Access to care; Delay: Late entry into prenatal care; violence; Chronic smoker
PROVIDER	Quality of care; Assessment: Inadequate risk assessment (cardiac history); Lack of care coordination—prenatal/labor and delivery/anesthesiology/emergency
FACILITY	Continuity care: same hospital at different visits (OB not notified of pp ER visit); communication (pp instructions); Policies/procedures: translation services
SYSTEM	Communication; Continuity of care: OB/cardiology/emergency, need for medical home in inter-conception period; Cultural: CLAS for providers, staff
COMMUNITY	Social support: referral to community resources for women with history of IPV

CONTRIBUTING FACTOR KEY (DESCRIPTIONS ON PAGE 4)

- Delay
- Adherence
- Knowledge
- Cultural/religious
- Environmental
- Violence
- Mental health conditions
- Substance use disorder - alcohol, illicit/prescription drugs
- Tobacco use
- Chronic disease
- Childhood abuse/ trauma
- Access/financial
- Unstable housing
- Social support/ isolation
- Equipment/ technology
- Policies/procedures
- Communication
- Continuity of care/ care coordination
- Clinical skill/ quality of care
- Outreach
- Law Enforcement
- Referral
- Assessment
- Legal
- Other

RECOMMENDATIONS OF THE COMMITTEE

If there was at least some chance that the death could have been averted, what were the specific and feasible actions that, if implemented or altered, might have changed the course of events? [Who?] should [do what?] [when?]

RECOMMENDATIONS OF THE COMMITTEE	LEVEL OF PREVENTION (SEE BELOW)	LEVEL OF IMPACT (SEE BELOW)
Obstetric provider should refer patients with a reported cardiac condition to cardiologist during prenatal care or between pregnancies.	Primary	Medium
Anesthesiology should evaluate and/or refer patients with reported cardiac conditions who present to Labor and Delivery, if not already done	Secondary	Small
All providers should utilize official translation services to discuss patient medical conditions, care, education, and follow-up.	Secondary	Small
OB should document reasons for patient's late entry to prenatal care and provide referrals to supportive community resources.	Secondary	Small
L&D nurses should perform postpartum risk screening on women with chronic medical needs in order to form postpartum discharge care plan.	Primary	Medium
State PQC should educate obstetric providers and ER staff on peripartum cardiomyopathy signs, treatment plans, and available resources. PQC	Primary	Large

PREVENTION LEVEL	EXPECTED IMPACT LEVEL
• **PRIMARY:** Prevents the contributing factor before it ever occurs	• **SMALL:** Education/counseling (community- and/or provider-based health promotion and education activities)
• **SECONDARY:** Reduces the impact of the contributing factor once it has occurred (i.e. treatment)	• **MEDIUM:** Clinical intervention and coordination of care across continuum of well-woman visits (protocols, prescriptions)
• **TERTIARY:** Reduces the impact or progression of what has become an ongoing contributing factor (i.e. management of complications)	• **LARGE:** Long-lasting protective intervention (improve readiness, recognition and response to obstetric emergencies/LARC)
	• **EXTRA LARGE:** Change in context (promote environments that support healthy living/ensure available and accessible services)
	• **GIANT:** Address social determinants of health (poverty, inequality, etc.)

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP · ERASE MM · REVIEW to ACTION

PRISMA HEALTH

MMRCs: Equity Framework

Understanding community contributing factors requires a shift in thinking

1. We can link MMRIA data to community context
2. Assigning contributing role of community in individual cases is challenging
3. Community factors may be more evident in aggregate data
4. Adaptation, implementation, and evaluation of a *Health Equity Toolkit* in process(!)

Kramer MR, Strahan AE, Preslar J, Zaharatos J, ST. Pierre A, Grant J, Davis NL, Goodman D, Callaghan W, Changing the conversation: Applying a health equity framework to maternal mortality reviews, *American Journal of Obstetrics and Gynecology* (2019), doi: https://doi.org/10.1016/j.ajog.2019.08.057

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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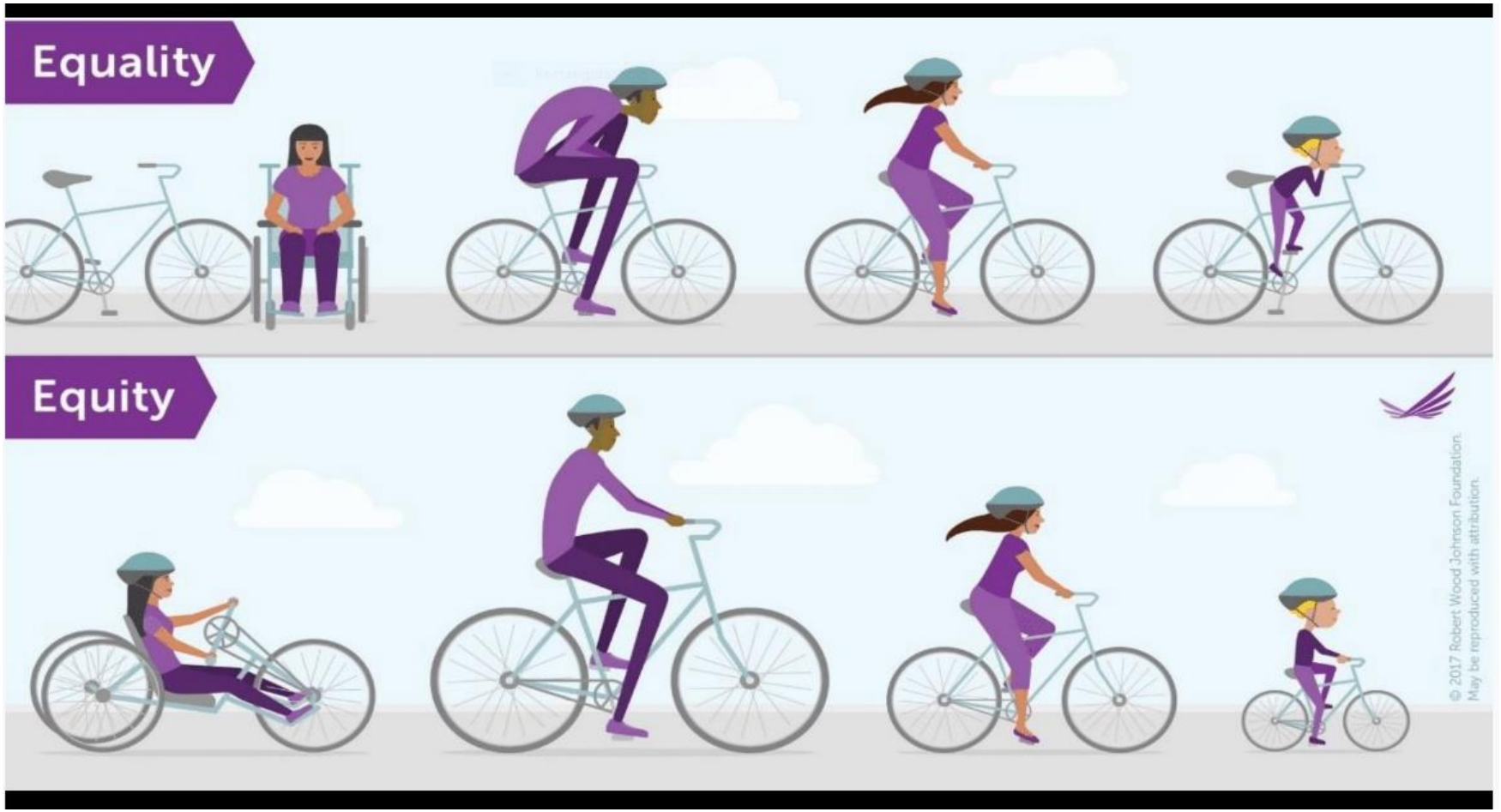
MMRCs Equity Framework

EQUALITY

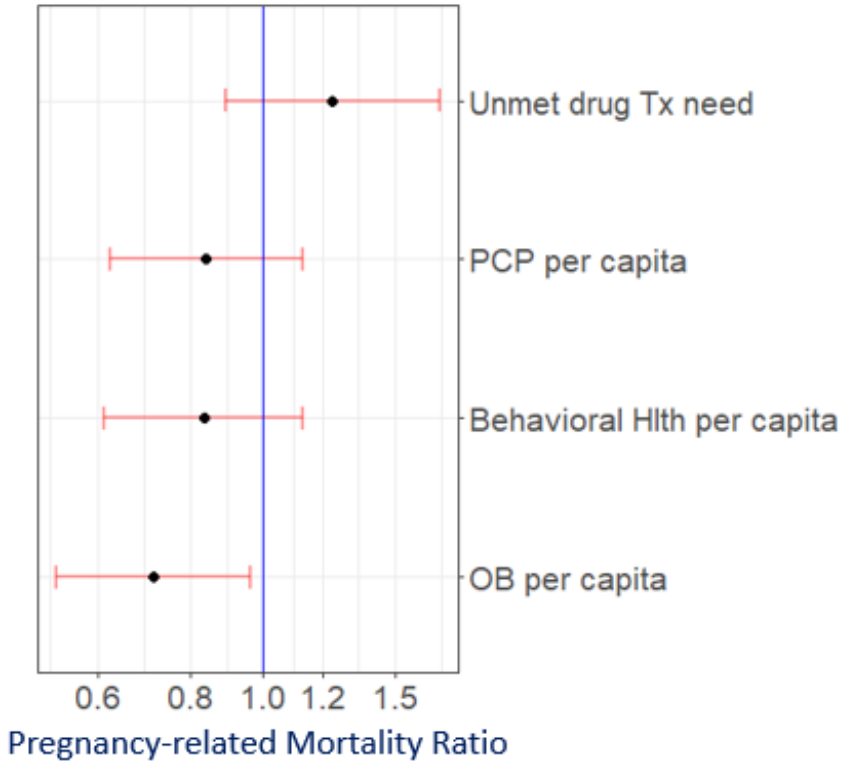
EQUITY

MMRCs: Equity Framework

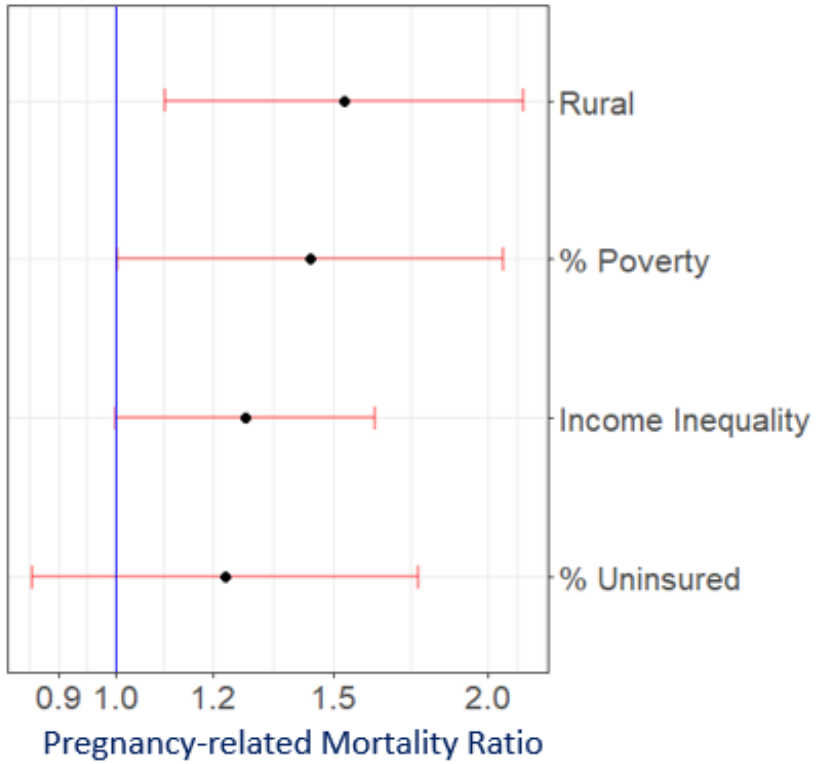


MMRCs: Equity Framework

Health Care Service Environ



Social Environ



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REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

PRISMA HEALTH

MMRCs: are NOT…

- A mechanism for assigning blame or responsibility for any death
- A research study
- Peer review
- An institutional review
- A substitute for existing mortality and morbidity inquiries

Experience a Maternal Mortality Review Committee In Action

www.reviewtoaction.org

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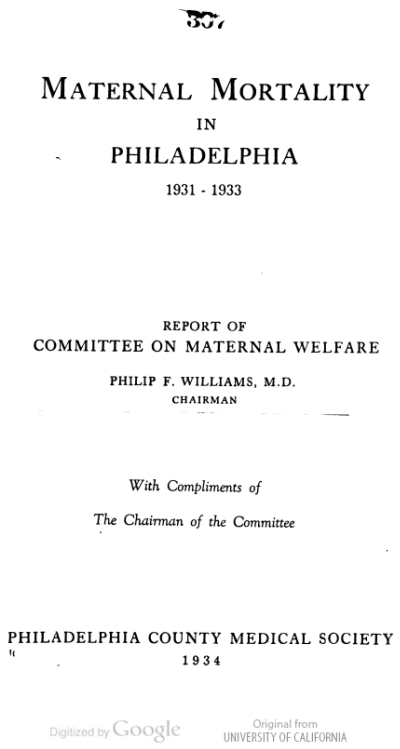
PRISMA HEALTH

MMRCs: Not New



MATERNAL MORTALITY
IN
PHILADELPHIA
1931 - 1933

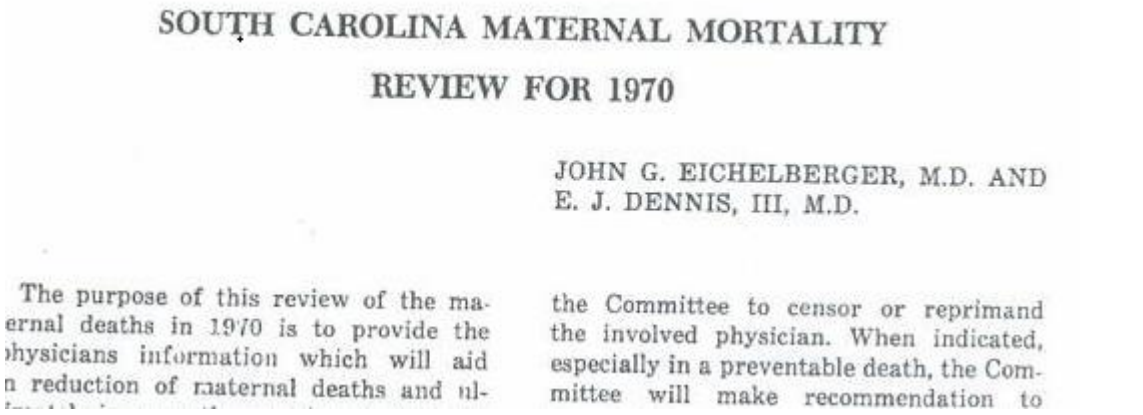
REPORT OF
COMMITTEE ON MATERNAL WELFARE

PHILIP F. WILLIAMS, M.D.
CHAIRMAN

With Compliments of

The Chairman of the Committee

PHILADELPHIA COUNTY MEDICAL SOCIETY
1934

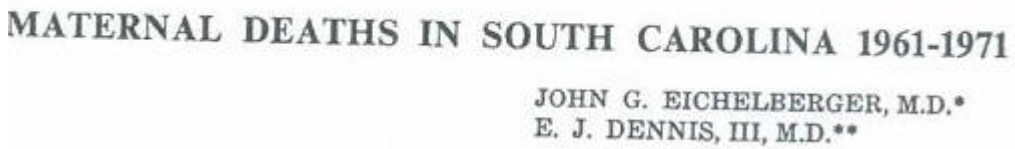


SOUTH CAROLINA MATERNAL MORTALITY
REVIEW FOR 1970

JOHN G. EICHELBERGER, M.D. AND
E. J. DENNIS, III, M.D.

The purpose of this review of the maternal deaths in 1970 is to provide the physicians information which will aid in reduction of maternal deaths and ill-

the Committee to censor or reprimand the involved physician. When indicated, especially in a preventable death, the Committee will make recommendation to



MATERNAL DEATHS IN SOUTH CAROLINA 1961-1971

JOHN G. EICHELBERGER, M.D.*
E. J. DENNIS, III, M.D.**

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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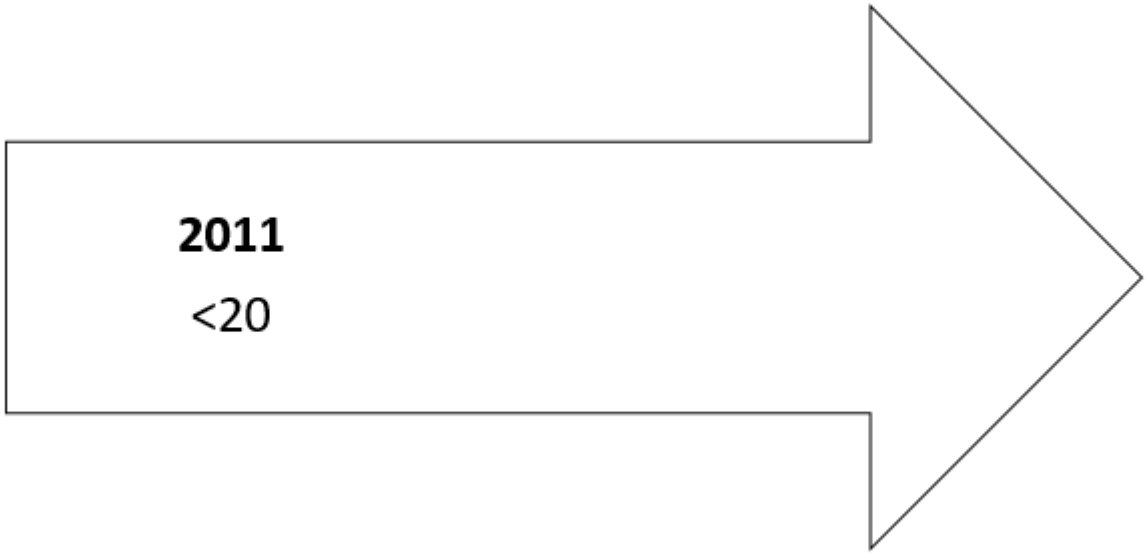
REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

(Re)Growth of MMRCs across the US



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(Re)Growth of MMRCs across the US

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP
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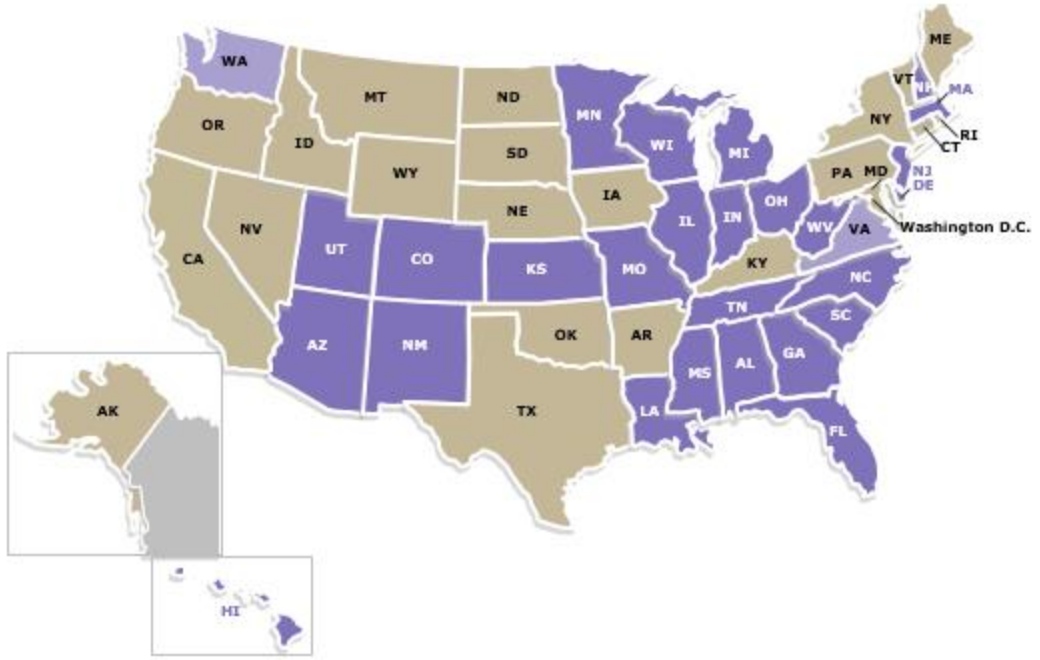
REVIEW to ACTION

PRISMA HEALTH

Maternal Mortality Review Information Application (MMRIA)

A common language for reviews to work together



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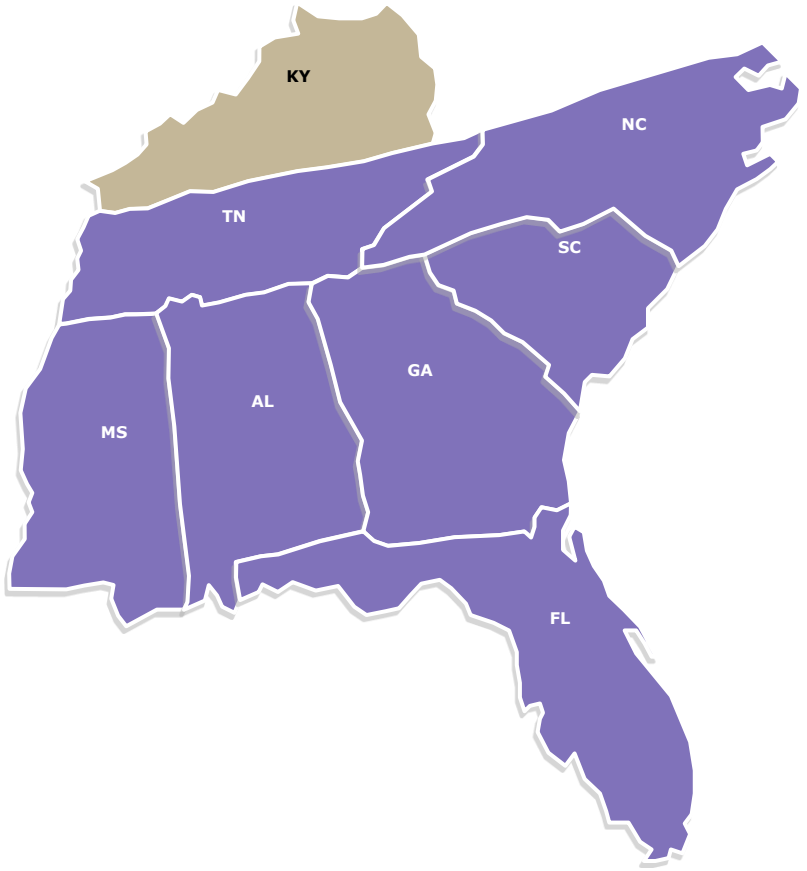
MMRIA in the Southeast Region IV



MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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MMRIA: Distribution of Pregnancy-related Deaths by Timing

14 MMRCs	33%	43%	23%
Region IV	37%	43%	20%

Davis NL, Smoots AN, Goodman DA. Pregnancy-Related Deaths: Data from 14 U.S. Maternal Mortality Review Committees, 2008-2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2019

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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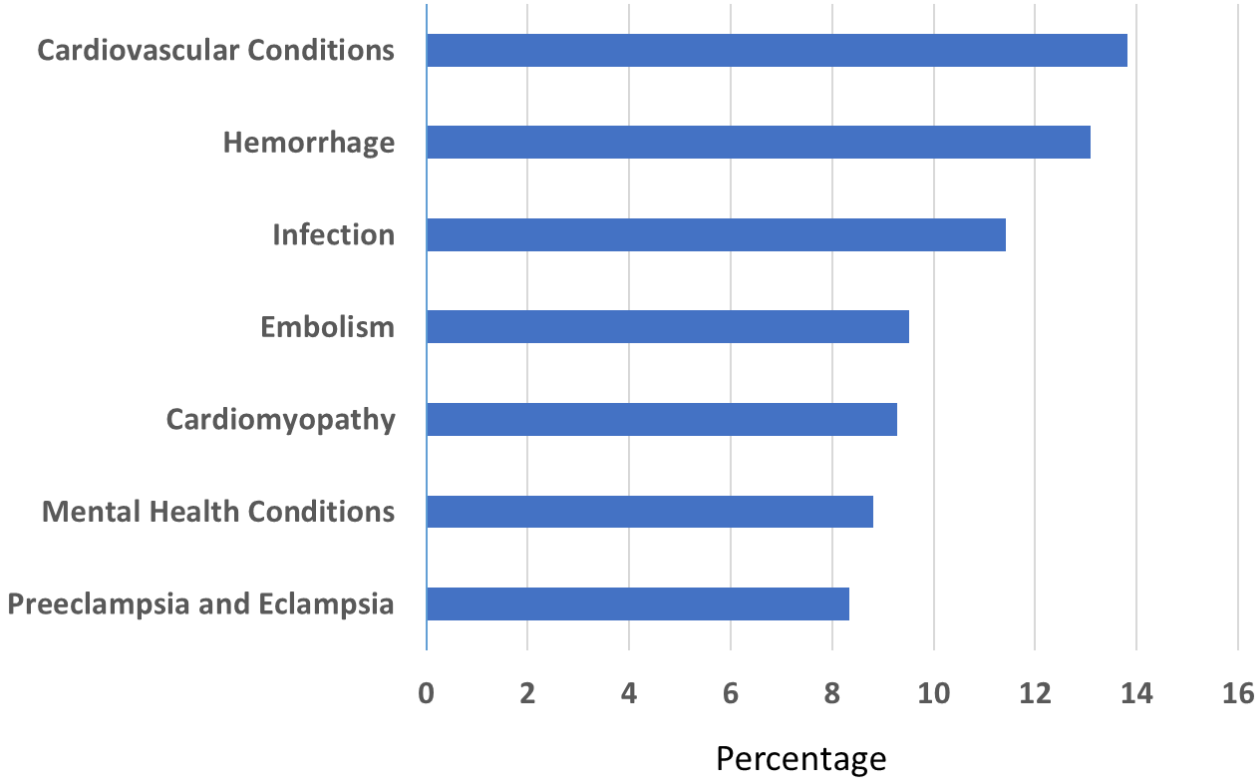
MMRIA: Leading Underlying Causes of Pregnancy-Related Deaths



Davis NL, Smoots AN, Goodman DA. Pregnancy-Related Deaths: Data from 14 U.S. Maternal Mortality Review Committees, 2008-2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2019

MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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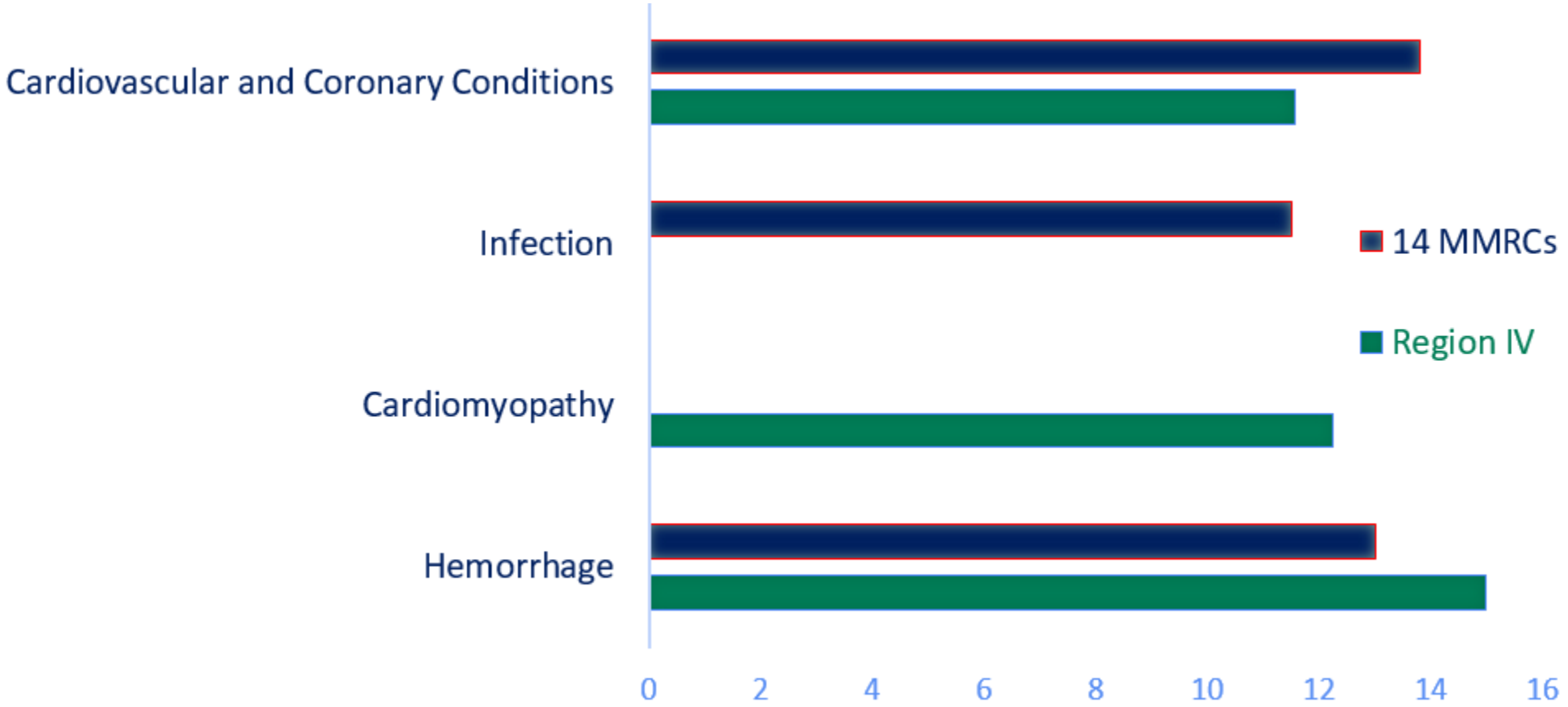
PRISMA HEALTH

MMRIA: 3 Leading Underlying Causes of Death



MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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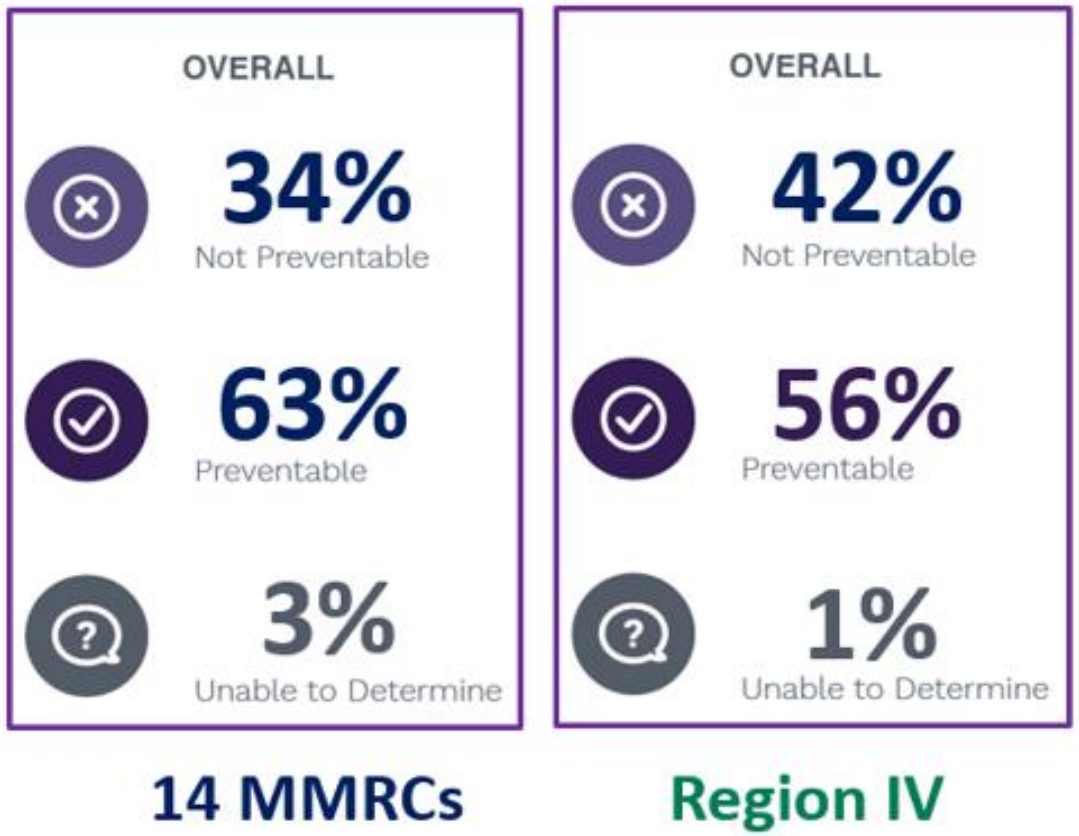
REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

MMRIA: Preventability



MMRIA MATERNAL MORTALITY REVIEW INFORMATION APP

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REVIEW to ACTION WORKING TOGETHER TO PREVENT MATERNAL MORTALITY

MMRIA: Preventability

Definition
A death is considered preventable if the committee determines 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.

Why
MMRCs determine preventability to prioritize interventions with the greatest opportunity for impact.

Every Death Reflects a Web of Missed Opportunities

Factors playing a part can include:

Access to care

Missed or delayed diagnoses

Not recognizing warning signsMost deaths *are preventable*, no matter when they occur

We can better identify and close gaps in access to quality care

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

The Way Forward

Health Care providers can:

Help patients manage chronic conditions

Communicate with patients about early warning signs

Use tools to flag warning signs early so women can receive timely treatment

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

The Way Forward

Hospitals and Health Systems can

Standardize coordination of care and response to emergencies (Safety bundles)

Improve delivery of quality prenatal and postpartum care

Train non obstetric providers to consider recent pregnancy history

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

The Way Forward

States and Communities can:

Assess and coordinate delivery hospitals for risk appropriate care

Support review of the causes behind every maternal death

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

The Way Forward

Women and their Families can:

Know and communicate about symptoms of complications

Note pregnancy history any time medical care is received in the year after delivery

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

Committee established by statute – 2016

Meets quarterly

Voluntary reporting

Annual report to the legislature

https://www.scstatehouse.gov/reports/DHEC/MMMR%202019%20Legislative%20Brief%20-%20Revised%2003182019.pdf

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

Multidisciplinary

Actively practicing

Based on ACOG and CDC recommendations

Three- to four-year terms

75% attendance requirements

Renewable once

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

3 YEARS

- ACOG
- MRM/OB each Regional Perinatal Center (RPC)
- SC Perinatal Association
- Coroner
- SC Hospital Association
- SC Department of Health and Human Services (DHHS)
- OB MD FQHC
- OB MD Level II hospital

4 YEARS

- OB Anesthesia
- Cardiology
- Domestic Violence
- Midwife
- Law Enforcement
- Alcohol and Drug Abuse
- Regional Systems Developers (RSDs)
- Family Medicine
- Psychiatry/Behavioral Medicine

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

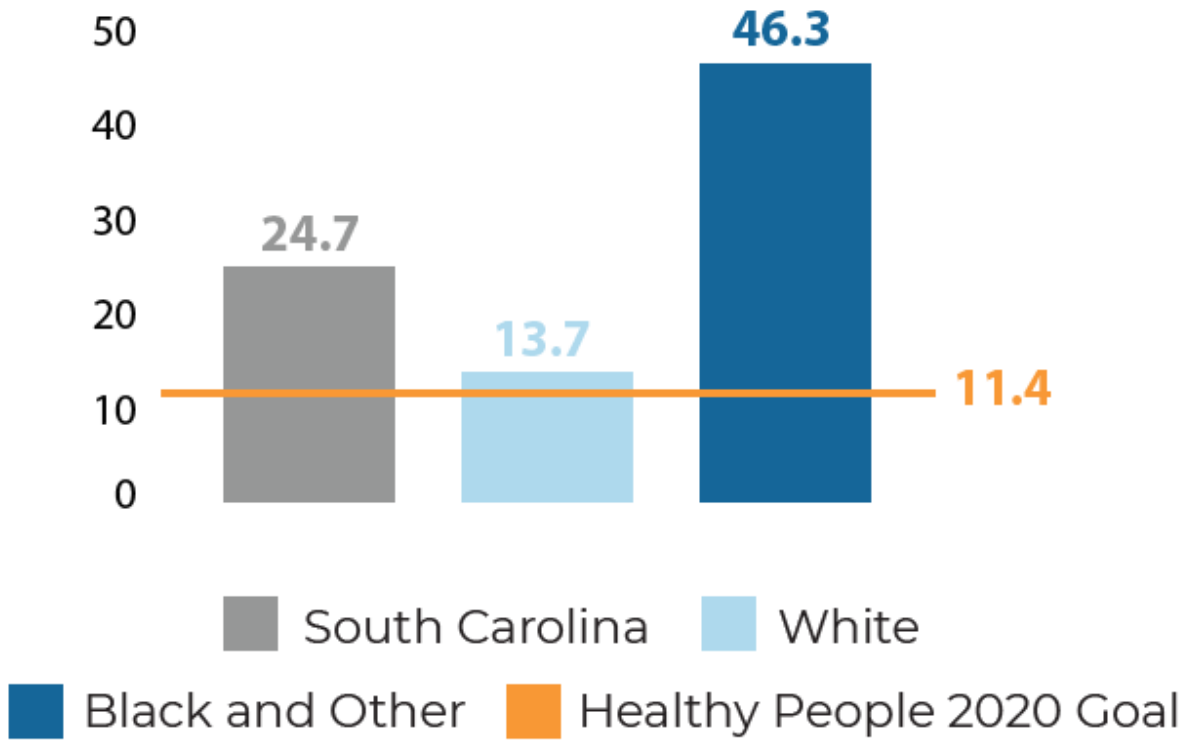
Goals of the South Carolina MMMR Committee

1. Determine the annual number of pregnancy-associated deaths that are pregnancy-related.
2. Identify trends and risk factors among preventable pregnancy-related deaths in South Carolina.
3. Develop actionable strategies for prevention and intervention.

https://www.scstatehouse.gov/reports/DHEC/MMMR%202019%20Legislative%20Brief%20-%20Revised%2003182019.pdf

South Carolina Pregnancy-Related Death by Race, 2013-2017[2]

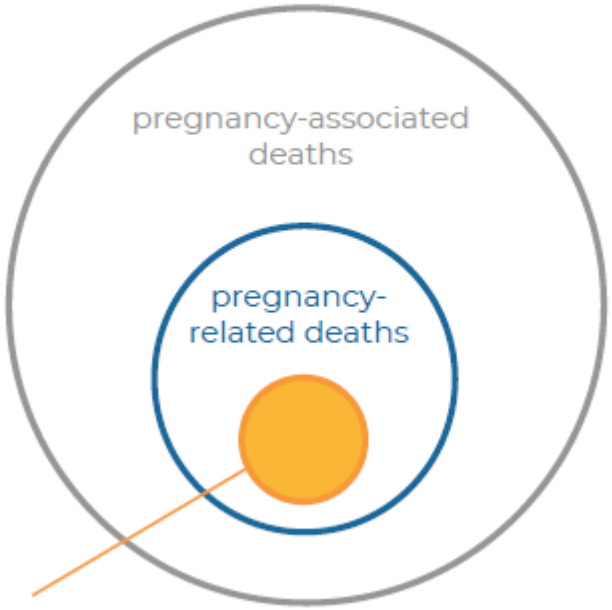
Rate per 100,000 live births



https://www.scstatehouse.gov/reports/DHEC/MMMR%202019%20Legislative%20Brief%20-%20Revised%2003182019.pdf

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

Scope of Case Review



Primary Focus
preventable pregnancy-related deaths

MMMR Committee Findings

During the 2016-2018 review period, 13 of the 15 maternal deaths reviewed in South Carolina were determined to be pregnancy-related. One death was determined to be pregnancy-associated but not related to pregnancy, and the other could not be determined. Among the 13 pregnancy-related deaths, 54% were determined to be preventable.

54%

As reported nationally[3], the findings from South Carolina's MMMR Committee show that the common causes of maternal death include cardiovascular and coronary conditions, hemorrhage, infection, and embolism.

https://www.scstatehouse.gov/reports/DHEC/MMMR%202019%20Legislative%20Brief%20-%20Revised%2003182019.pdf

Preventability

A death is *considered preventable* if the committee determines that there was some chance of the death being averted by one or more reasonable changes to patient, community, provider, health facility, and/or system factors.

Most common **preventable** causes of death include:

Cardiovascular and cardiac conditions

Hemorrhage

Infection

Embolism

Building U.S. Capacity to Review and Prevent Maternal Deaths. (2018) Report from nine maternal mortality review committees.

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

SC MMMRC ACCOMPLISHMENTS

SC uses the **MMRIA** reporting format

CDC-developed
Makes our data more powerful
Assist with identifying social determinants
Includes community factors

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

Voluntary reporting **mmmr@dhec.sc.gov**

Matching maternal death certificates with fetal live birth/death certificates (new in 2019)

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

SC MMMRC ACCOMPLISHMENTS

South Carolina contributed aggregate state data to national surveillance efforts and CDC publications

Vital Signs: Pregnancy-Related Deaths, United States, 2011–2015, and Strategies for Prevention, 13 States, 2013–2017

Emily E. Petersen, MD[1]; Nicole L. Davis, PhD[1]; David Goodman, PhD[1]; Shanna Cox, MSPH[1]; Nikki Mayes[1]; Emily Johnston, MPH[1]; Carla Syverson, MSN[1]; Kristi Seed[1]; Carrie K. Shapiro-Mendoza, PhD[1]; William M. Callaghan, MD[1]; Wanda Barfield, MD[1]

On May 7, 2019, this report was posted as an MMWR *Early Release on the* MMWR *website (https://www.cdc.gov/mmwr).*

Abstract

Background: Approximately 700 women die from pregnancy-related complications in the United States every year.

Methods: Data from CDC's national Pregnancy Mortality Surveillance System (PMSS) for 2011–2015 were analyzed. Pregnancy-related mortality ratios (pregnancy-related deaths per 100,000 live births; PRMRs) were calculated overall and by sociodemographic characteristics. The distribution of pregnancy-related deaths by timing relative to the end of pregnancy and leading causes of death were calculated. Detailed data on pregnancy-related deaths during 2013–2017 from 13 state maternal mortality review committees (MMRCs) were analyzed for preventability, factors that contributed to pregnancy-related deaths, and MMRC-identified prevention strategies to address contributing factors.

Results: For 2011–2015, the national PRMR was 17.2 per 100,000 live births. Non-Hispanic black (black) women and American Indian/Alaska Native women had the highest PRMRs (42.8 and 32.5, respectively), 3.3 and 2.5 times as high, respectively, as the PRMR for non-Hispanic white (white) women (13.0). Timing of death was known for 87.7% (2,990) of pregnancy-related deaths. Among these deaths, 31.3% occurred during pregnancy, 16.9% on the day of delivery, 18.6% 1–6 days postpartum, 21.4% 7–42 days postpartum, and 11.7% 43–365 days postpartum. Leading causes of death included cardiovascular conditions, infection, and hemorrhage, and varied by timing. Approximately sixty percent of pregnancy-related deaths from state MMRCs were determined to be preventable and did not differ significantly by race/ethnicity or timing of death. MMRC data indicated that multiple factors contributed to pregnancy-related deaths. Contributing factors and prevention strategies can be categorized at the community, health facility, patient, provider, and system levels and include improving access to, and coordination and delivery of, quality care.

Conclusions: Pregnancy-related deaths occurred during pregnancy, around the time of delivery, and up to 1 year postpartum; leading causes varied by timing of death. Approximately three in five pregnancy-related deaths were preventable.

Implications for Public Health Practice: Strategies to address contributing factors to pregnancy-related deaths can be enacted at the community, health facility, patient, provider, and system levels.

Introduction

Approximately 700 women die annually in the United States from pregnancy-related complications (*1*). Significant racial/ethnic disparities in pregnancy-related mortality exist; black women have a pregnancy-related mortality ratio approximately three times as high as that of white women (*2*,*3*). Better understanding is needed on the circumstances surrounding pregnancy-related deaths and strategies to prevent future deaths.

This report describes the timing and characteristics of pregnancy-related deaths in the United States using 2011–2015 national CDC Pregnancy Mortality Surveillance System (PMSS) data. Data from 13 state maternal mortality review committees (MMRCs) during 2013–2017 were used to determine the percentage of pregnancy-related deaths that were preventable and factors that contributed to the deaths. MMRC-identified strategies for prevention are reported.

Methods

PMSS was established in 1986 by CDC and the American College of Obstetricians and Gynecologists (ACOG) to evaluate the causes of death and risk factors associated with pregnancy-related deaths. PMSS methodology has been described previously (*2*); CDC's Division of Reproductive Health requests that all states, the District of Columbia, and New York City send death certificates, linked live birth or fetal death certificates, and additional data when available, on deaths that occurred during

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

SC MMMRC ACCOMPLISHMENTS

Annual Report to the South Carolina Birth Outcomes Initiative (SC BOI) each Spring

Annual Report to the SC General Assembly

https://www.scstatehouse.gov/reports/DHEC/MMMR%202019%20Legislative%20Brief%20-%20Revised%2003182019.pdf

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

RECOMMENDATIONS

Information to state cardiologists ??
One question on intake forms?

Are you planning a pregnancy in the next year? – with referral information readily available

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

RECOMMENDATIONS

Support for Maternal levels of care
Women at high risk for complications receive care in facilities prepared to provide the required level of specialized care can improve outcomes

SC is becoming an AIM state

Adopt hemorrhage and hypertension protocols at every birthing facility in the state

Continued support for SimCoach

SC Maternal Morbidity and Mortality Review Committee (MMMRC)

NEXT STEPS

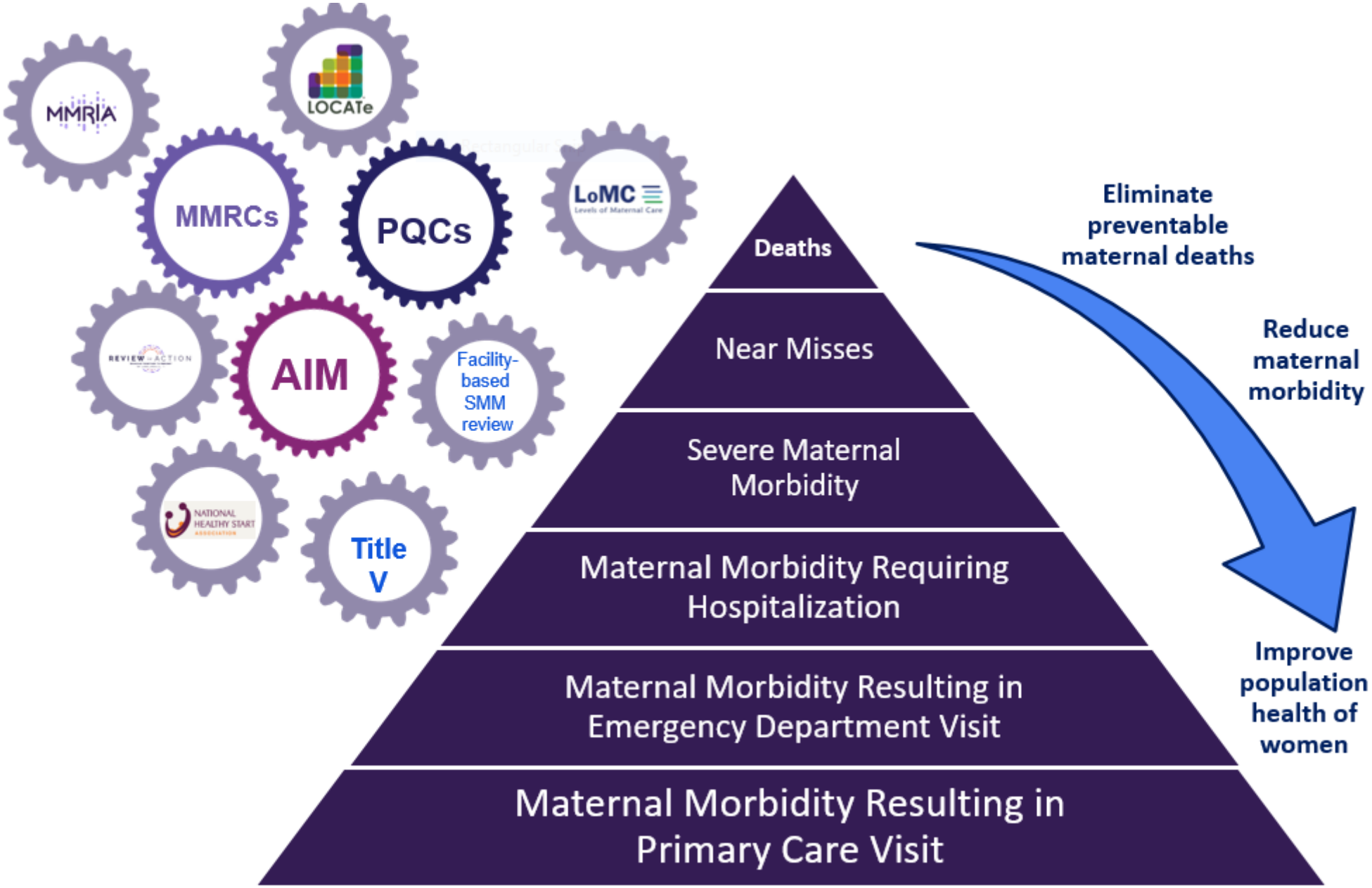
Removed barriers to accessing data (**recent passing of bill!**)

Identify funding (still a work in progress)

Family or informant interviews

Improve reporting of maternal deaths

- Increase reporting through **mmmr@dhec.sc.gov**
- ***Make reporting a requirement***
- Linkage of maternal death/live birth, fetal death certificates


MMRIA
LOCATe
MMRCs
PQCs
LoMC
Levels of Maternal Care
REVIEW to ACTION
AIM
Facility-based SMM review
NATIONAL HEALTHY START ASSOCIATION
Title V
Deaths
Near Misses
Severe Maternal Morbidity
Maternal Morbidity Requiring Hospitalization
Maternal Morbidity Resulting in Emergency Department Visit
Maternal Morbidity Resulting in Primary Care Visit
Eliminate preventable maternal deaths
Reduce maternal morbidity
Improve population health of women

Thanks and Questions!

Judith.burgis@prismahealth.org