Indiana Department of Health

Indiana Maternal Mortality Review

OUR MISSION:

To promote, protect, and improve the health and safety of all Hoosiers.

OUR VISION:

Every Hoosier reaches optimal health regardless of where they live, learn, work, or play.

Maternal Health

- Defined as the health of women during pregnancy and childbirth and in the postpartum period.
- Typically, women have more interaction with and access to healthcare services during pregnancy.
- Care during pregnancy can highlight larger concerns, such as underlying chronic disease.
- Care during pregnancy provides an opportunity to identify, treat, and manage conditions to improve a woman's overall health.

Maternal Mortality

- Death of a woman during pregnancy or close in time to pregnancy.
- These deaths are considered sentinel events that highlight critical issues in women's health and healthcare systems.

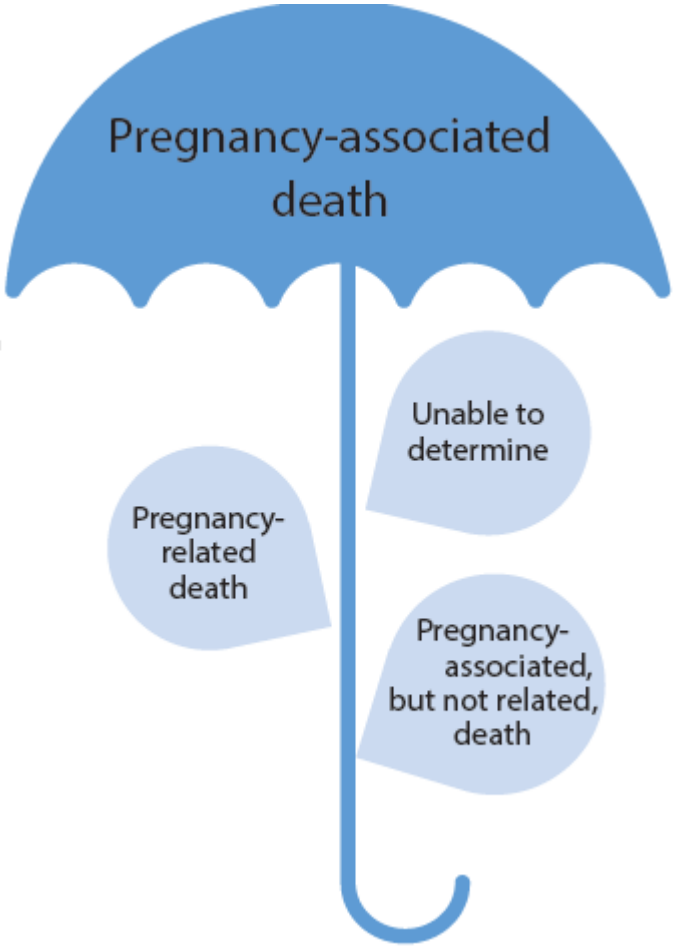
In July 2018, IC 16-50 was enacted and required IDOH to coordinate a multidisciplinary MMRC whose goal is to determine risk and protective factors contributing to pregnancy-associated deaths, including pregnancy-related deaths. Resulting data will be used to identify interventions aimed at improving systems of care and preventing future maternal morbidity and mortality in Indiana.

Definitions

Pregnancy-Associated Death = The death of a woman while pregnant or **within one year** of the termination of a pregnancy, regardless of the cause

Pregnancy-Related Death = The death of a woman during pregnancy or **within one year** of the end of a pregnancy from a pregnancy complication, a chain of events initiated by the pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy

Pregnancy-Associated, But Not Related Death = 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



Source: Ohio Dept of Health

Measures of Maternal Mortality

Maternal death (WHO and NCHS)

- While pregnant (or within **42** days of termination of pregnancy)
- Regardless of the duration and site of the pregnancy
- From any cause **related to or aggravated by the pregnancy or its management**
- **Not** from accidental causes

- Maternal Mortality Ratio
  - Maternal deaths per live births, during same time period
  - Expresses direct or indirect obstetric risk
  - Source is vital records ICD-10 codes and pregnancy checkbox

World Health Organization

Centers for Disease Control and Prevention
National Center for Health Statistics

MD/Live Births x 100,000

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Measures of Maternal Mortality

Pregnancy Mortality Surveillance System (CDC)

- While pregnant (or within **one year** of termination of pregnancy)
- Regardless of the duration and site of the pregnancy
- From any cause **related to or aggravated by the pregnancy or its management**
- **Not** from accidental or incidental causes

- Pregnancy-Related Mortality Ratio
  - Pregnancy-related deaths per live births, during same time period.
  - CDC epidemiologists rely on vital records and use limited data to determine relatedness.

Pregnancy-Related Deaths/Live Births x 100,000

Measures of Maternal Mortality

Maternal Mortality Review Committee Data

- While pregnant (or within **one year** of termination of pregnancy)
- Regardless of the duration and site of the pregnancy
- From **any** cause

- Pregnancy-Associated Mortality Ratio and Pregnancy-Related Mortality Ratio
  - Pregnancy-associated or -related deaths per live births, during same time period
  - Data source is medical/social records for the women, as well as **MMRC-determinations of relatedness**

Pregnancy-Associated or Related Deaths/Live Births x 100,000

Caution on Data Comparisons

The 2018 mortality ratios in this report should *not* be used for comparisons to any rates based on PMSS or other data.

- As a result of the case identification and review process, MMRC mortality ratios are a more accurate representation of the true burden of maternal mortality in Indiana.
- Previously published maternal mortality rates and ratios for Indiana did not use other records (autopsy, medical records, coroner records) to confirm pregnancy status.
- The MMRC was able to determine how many deaths were pregnancy-related vs. overall pregnancy-associated.

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Indiana MMRC Members

The MMRC membership, including IDOH staff, was comprised 73% white members and 26% persons of color.
(Note – these categories may differ slightly from what the members themselves may self-identify.)

A multidisciplinary MMRC is critical for effective reviews, as well as to meet the requirements of the CDC's ERASE MM project. The disciplines of the Indiana MMRC include:

- 15 physicians practicing either OB/GYN and/or MFM
- 7 professionals specializing in social work and/or mental health
- 12 nursing staff
- 3 doula/midwives
- 3 professionals representing healthcare systems, including legal
- 3 professionals representing women's and/or minority health
- 11 public health professionals
- 2 cardiology physicians
- 2 pathologists
- 1 geneticist
- 1 law enforcement professional
- 1 professional specializing in interpersonal-violence prevention

MMRC Questions

1. Was the death pregnancy-related?
2. What was the underlying cause of death?
3. Was the death preventable?

A death was considered preventable if the MMRC determined that there was at least some chance of the death being averted.

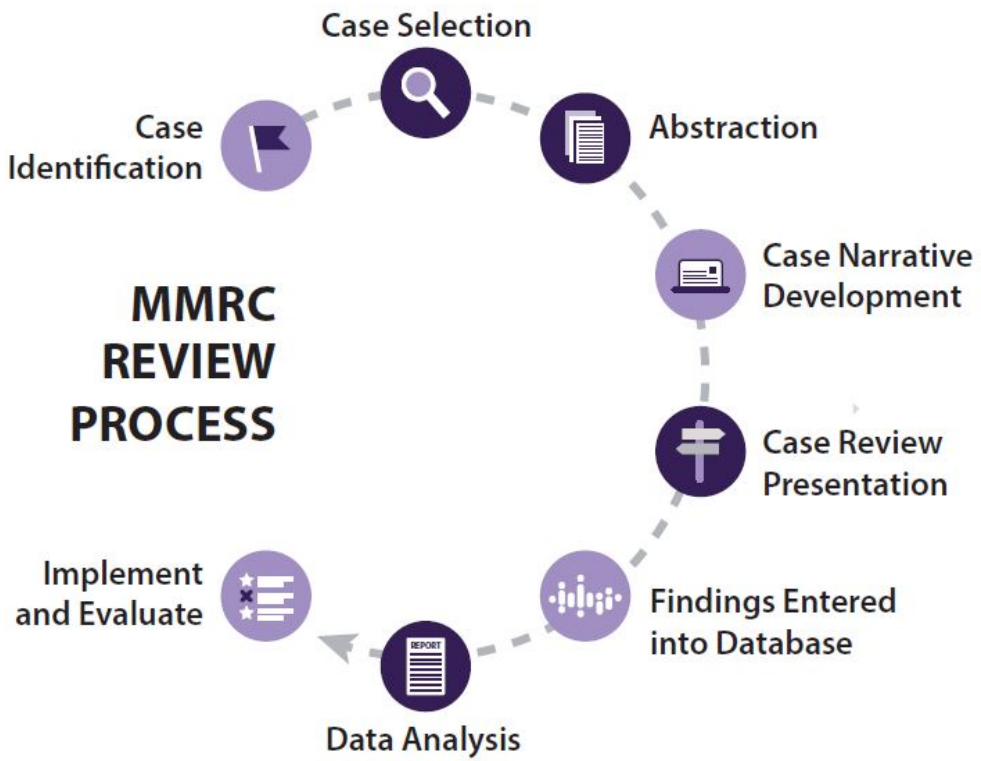
4. What were the factors that contributed to the death?

Factors identified by the MMRC that contributed to the death. These are steps along the way that, if altered, may have prevented the woman's death. The factors may be related to the patient, healthcare providers, facilities/hospitals where the woman sought care, or the systems that influence the lifestyle, care, and health services for the woman.

5. What are recommendations and actions that address those contributing factors?

Indiana MMR Process

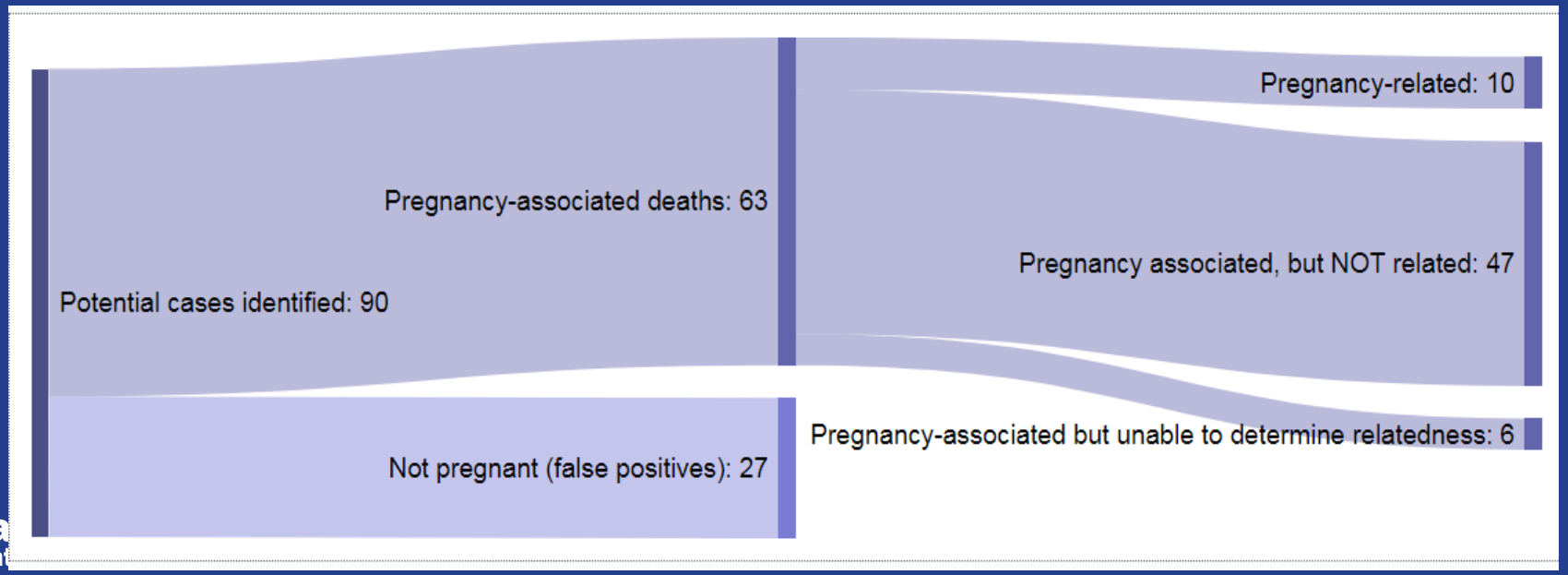
- Case identification
- Collection of relevant medical and social histories
- Abstraction and redaction by nursing team
- MMRC review
- Identification of contributing factors
- Formation of recommendations



Case Identification

Cases were identified via:

- **Pregnancy checkbox** and **O-code** cause of death on death certificates
- Assistance from **IHA**
- **Matching death certificates** to birth certificates and fetal death certificates
- **Facility notification**



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This data was generated by the Indiana MMR Program

False Positives and Finding Missed Cases

- After initially identifying cases through these methods, our abstraction team looked at medical records and autopsies and spoke with death certifiers to confirm pregnancy status at death.
  - *We were ultimately able to **exclude 27 cases (of 60)** we had identified who had not actually been pregnant or recently pregnant at time of death.*

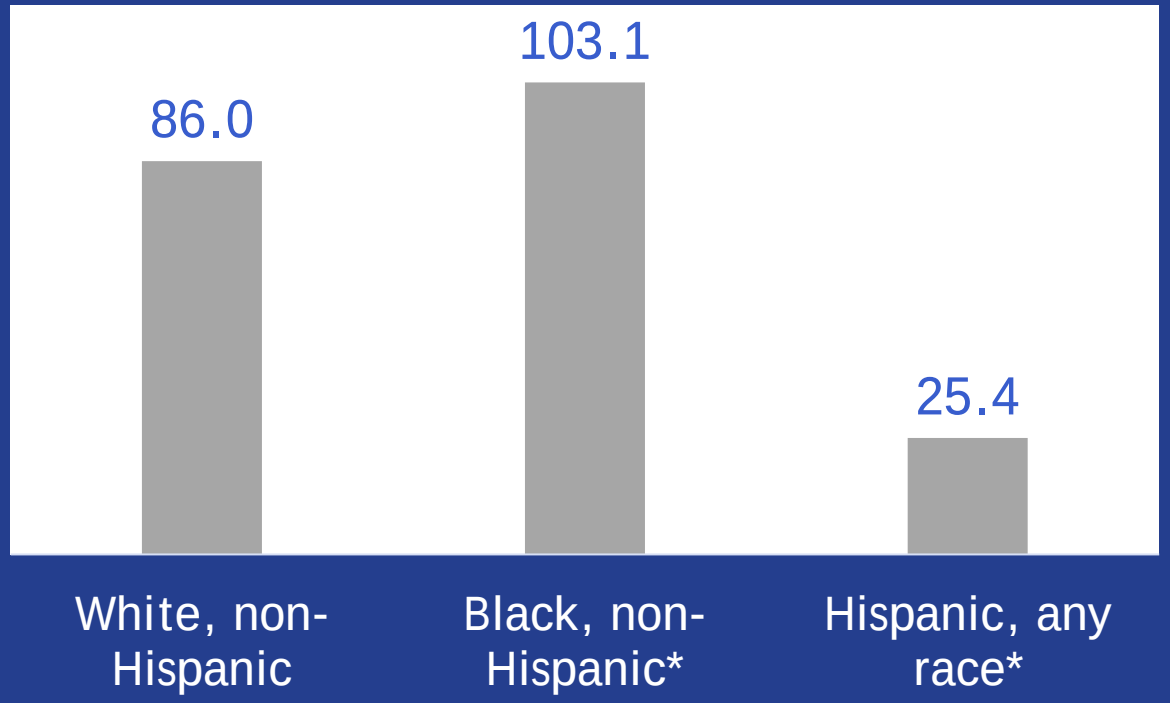
- Between collaboration with IHA and linking all women's death certificates to recent birth certificates and fetal death records, we discovered missed cases that had not been marked on death records in any way.
  - *We identified an **additional 30 cases** through this process.*

Findings:
2018
Pregnancy-Associated Deaths

Case Characteristics (n=63)

Race/Ethnicity	N	%
White, non-Hispanic	50	79.4%
Black, non-Hispanic	11	17.5%
Hispanic, any race	2	3.2%
Other	0	0.0%

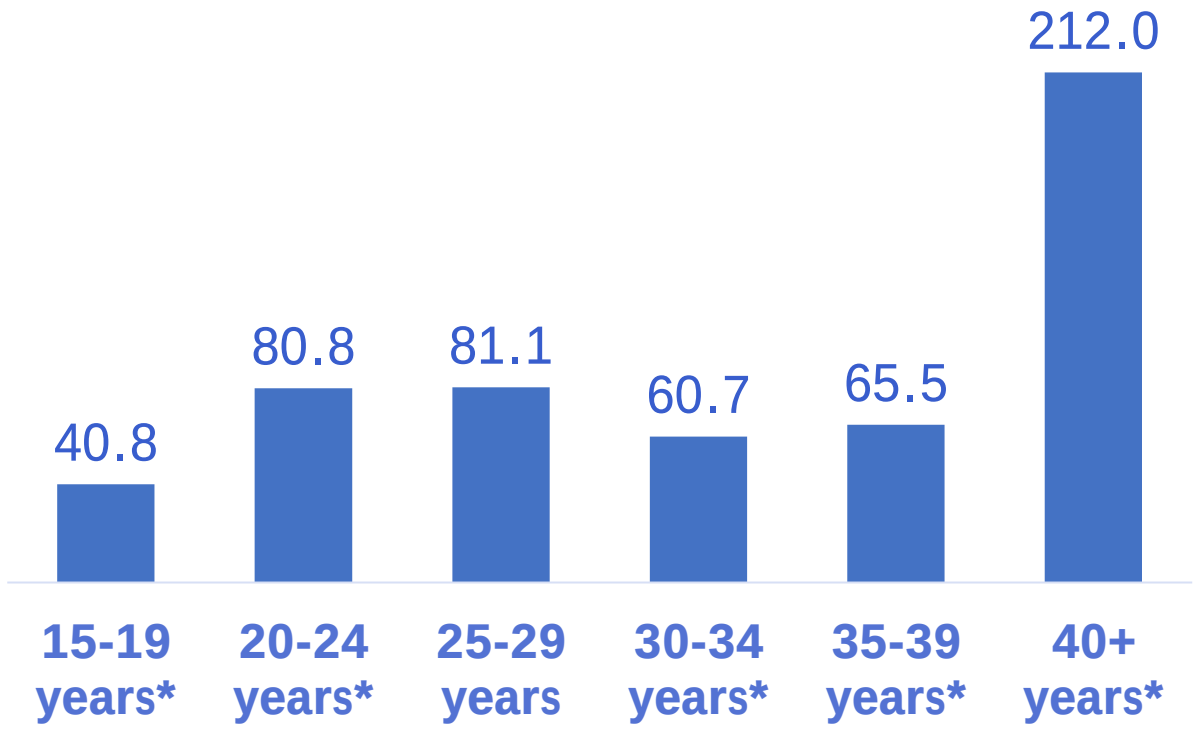
Rate of pregnancy-associated deaths by race and ethnicity per 100,000 live births



Case Characteristics (n=63)

Age at Death	N	%
15-19 years	2	3.2%
20-24 years	16	25.4%
25-29 years	22	34.9%
30-34 years	13	20.6%
35-39 years	6	9.5%
40+ years	4	6.3%

Rate of pregnancy-associated deaths by age of the mother at death per 100,000 live births



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Case Characteristics (n=63)

Education Level	N	%
Less than HS	8	12.7%
HS grad or GED	33	52.3%
Some college	11	17.4%
Associates or bachelors	11	17.4%
Advanced degree	0	0.0%

Occupation at Death	N	%
Employed	35	55.6%
Unemployed or listed as homemaker	21	33.3%
Disabled	1	1.6%
Student	2	3.2%
Unknown	4	6.3%

Case Characteristics (n=63)

Urban Status of Last Residence	N	%
Metropolitan	45	71.4%
Micropolitan	9	14.3%
Rural	5	7.9%
Unknown	4	6.3%

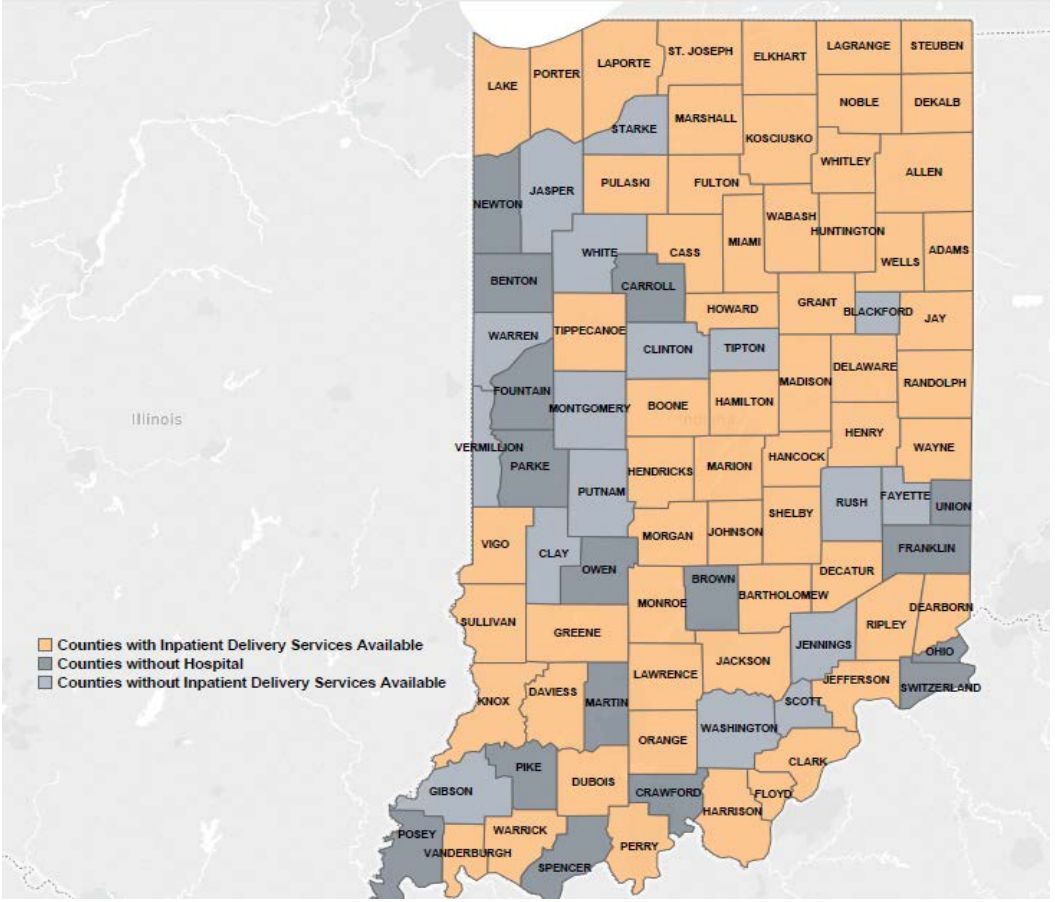
Metropolitan counties: urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties

Micropolitan counties: have at least one cluster of at least 10,000 but less than 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties

Rural counties: neither metropolitan nor micropolitan

These definitions were set by the Office of Management and Budget, and used by the US Census Bureau

Case Characteristics (n=63)



11.1%

of pregnancy-associated deaths last resided in

an OB desert county

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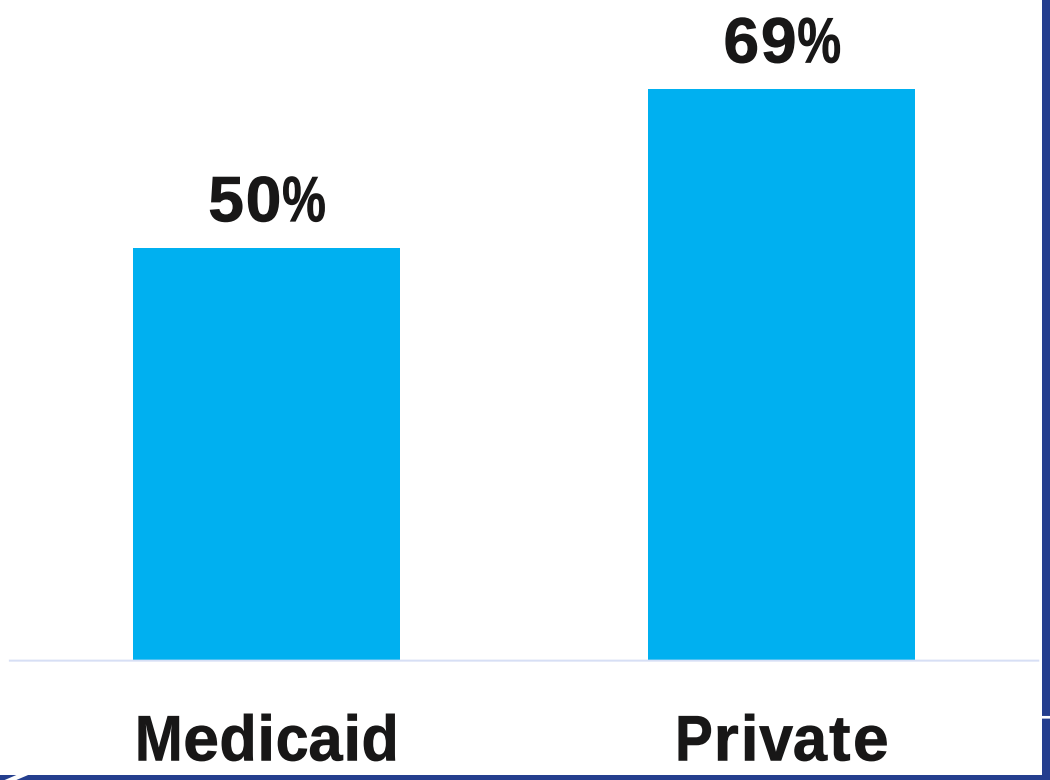
Case Characteristics (n=63)

Prenatal care	N	%
Early prenatal care	28	44.4%
Second trimester care	15	23.8%
Late prenatal care	3	4.8%
No prenatal care	15	23.8%
Unknown	2	3.2%

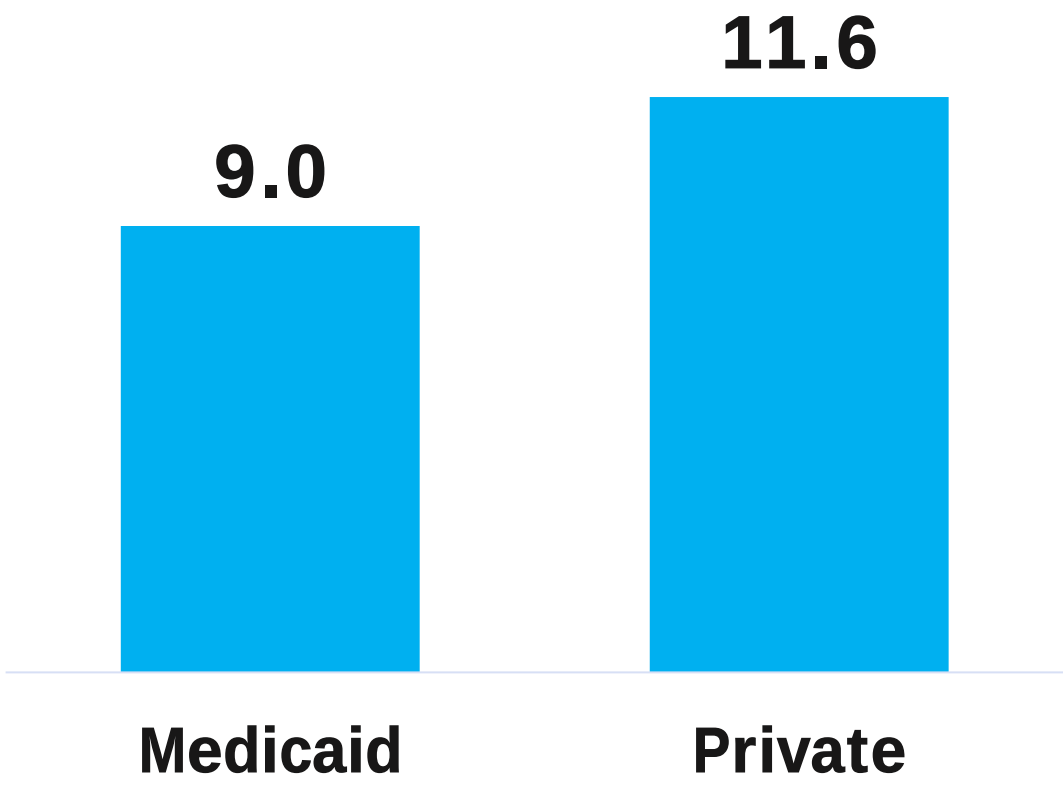
Insurance Status	N	%
Private	13	20.6%
Medicaid	36	57.1%
None/Self-pay	3	4.8%
Unknown	11	17.5%

Prenatal Care by Insurance Status

Percentage of maternal deaths where women entered prenatal care in the first trimester of pregnancy, by insurance status



Average number of prenatal care appointments kept among maternal deaths, by insurance status



This data was generated by the Indiana MMR Program

Timing of *All* Pregnancy-Associated Deaths

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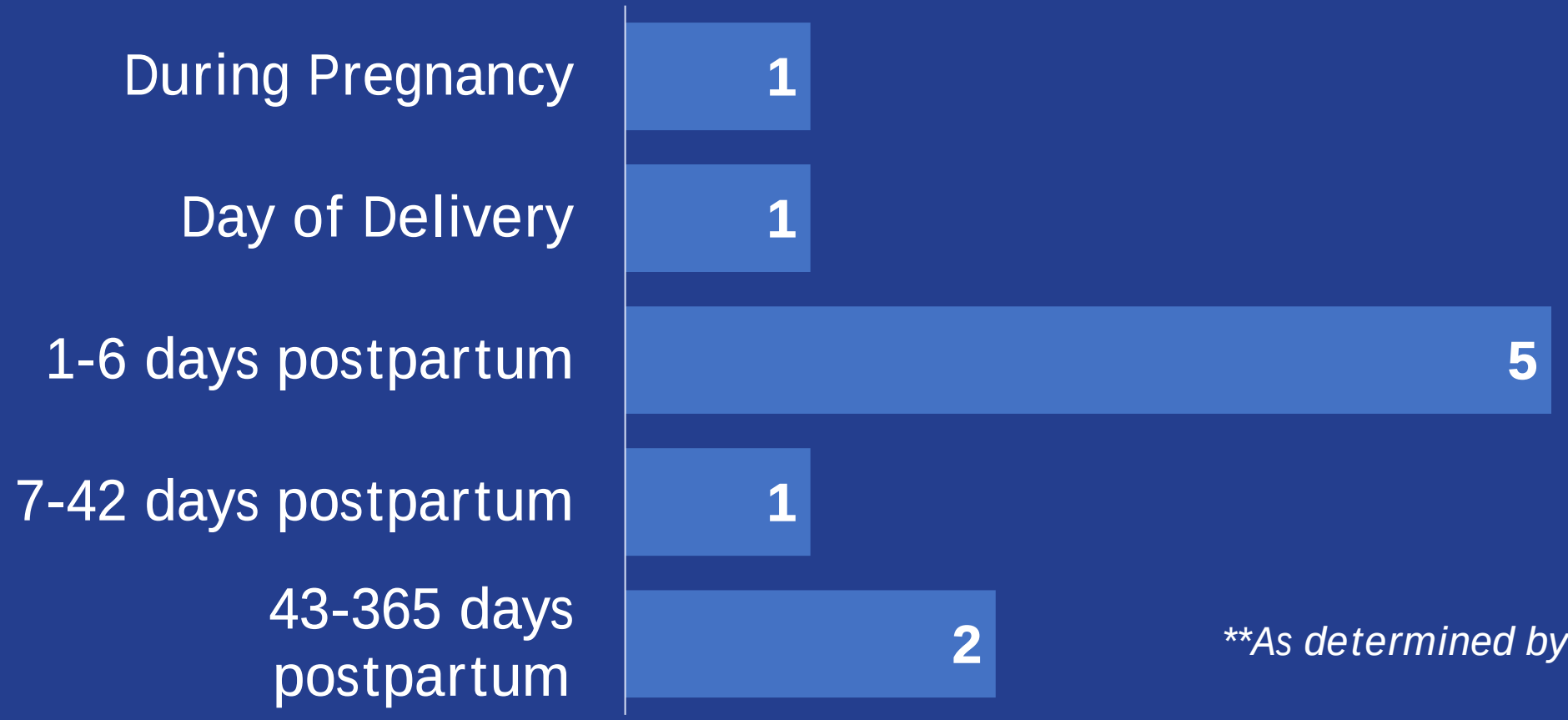
Timing of Pregnancy-Related Deaths** *Only*



***As determined by the MMRC*

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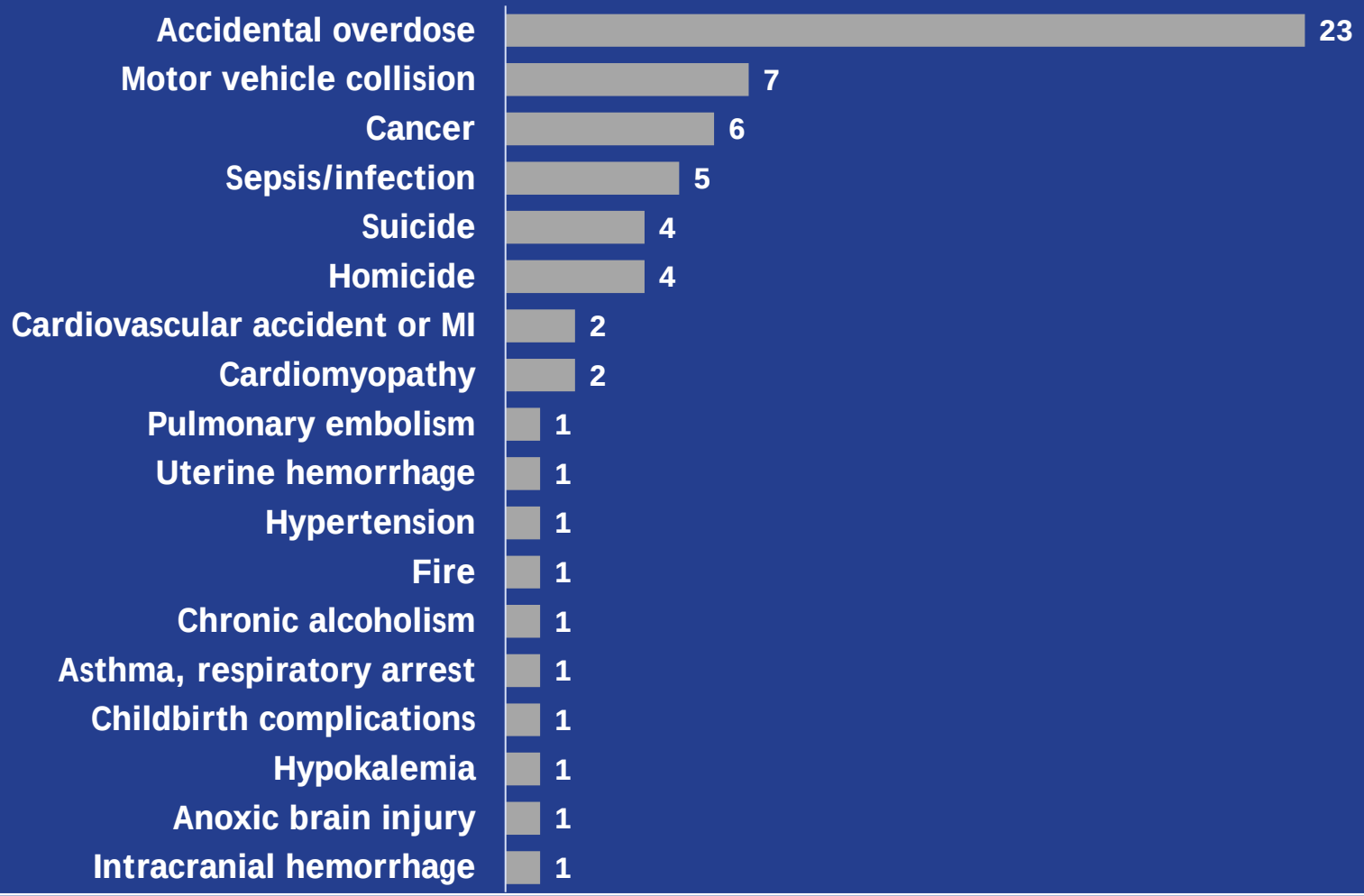
Underlying Cause of Death: Pregnancy-Associated Deaths



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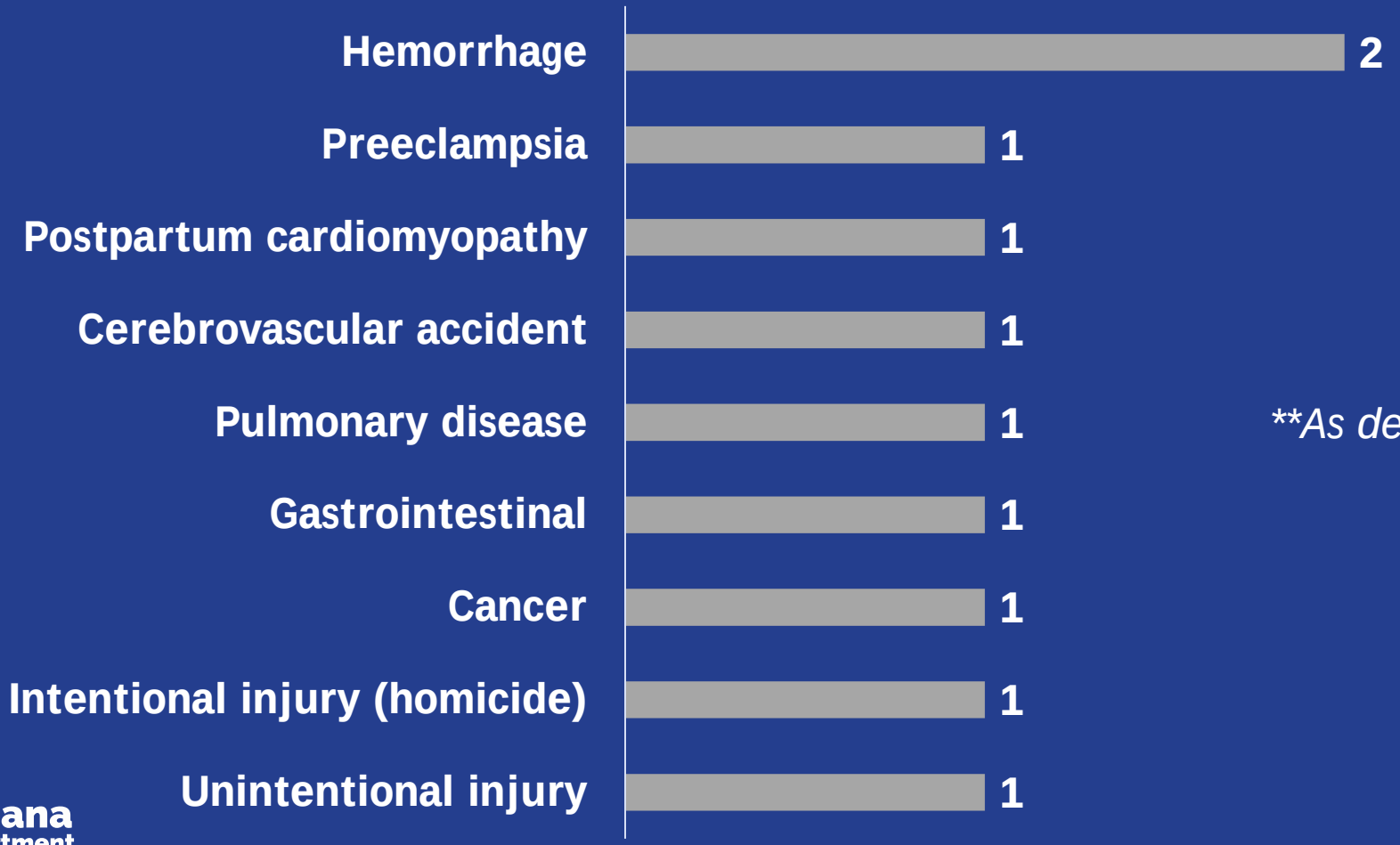
Underlying Cause of Death: Pregnancy-Related** Deaths Only



***As determined by the MMRC*

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Maternal Mortality Rate

77.2 per 100,000 live births
rate of pregnancy-associated deaths
in Indiana in 2018

- The death from any cause of a woman during pregnancy or within one year of the end of pregnancy

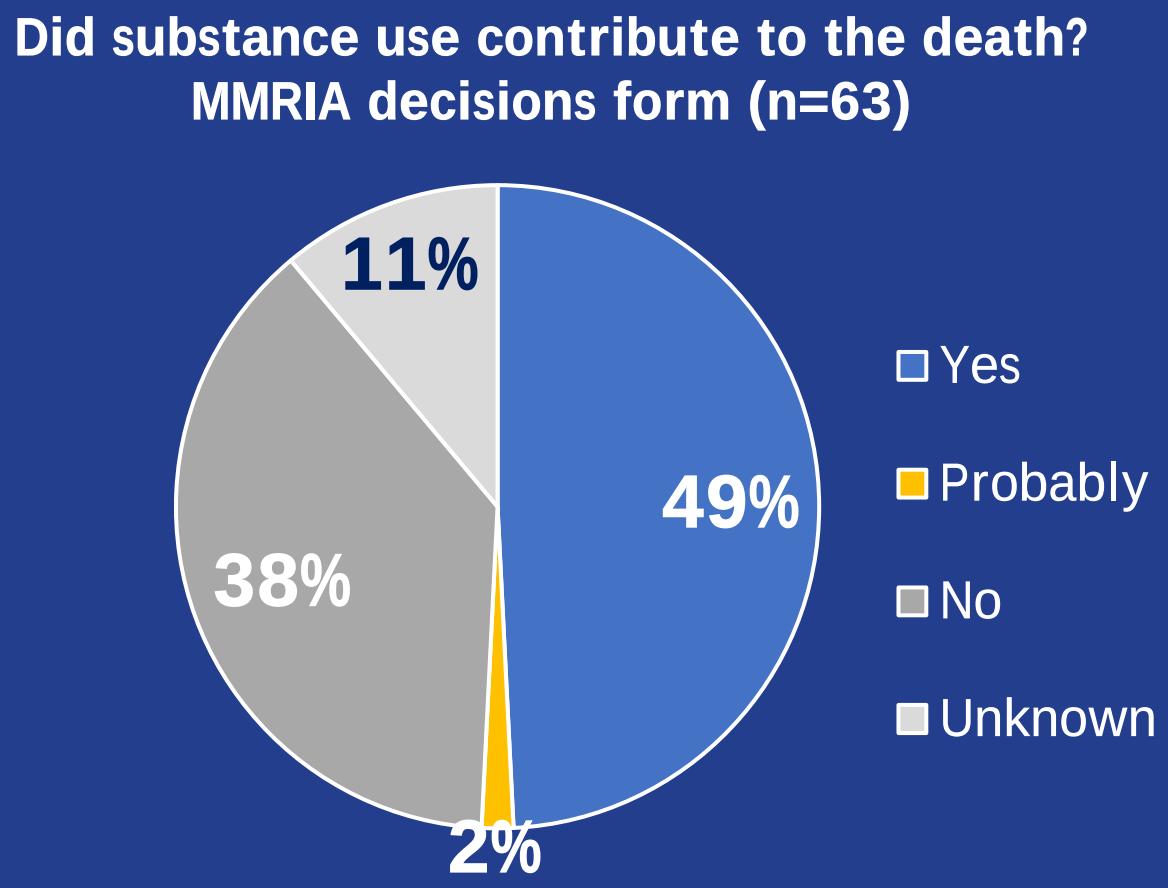
12.2 per 100,000 live births
rate of pregnancy-related deaths
in Indiana in 2018

- 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 physiological effects of pregnancy

This data was generated by the Indiana MMR Program

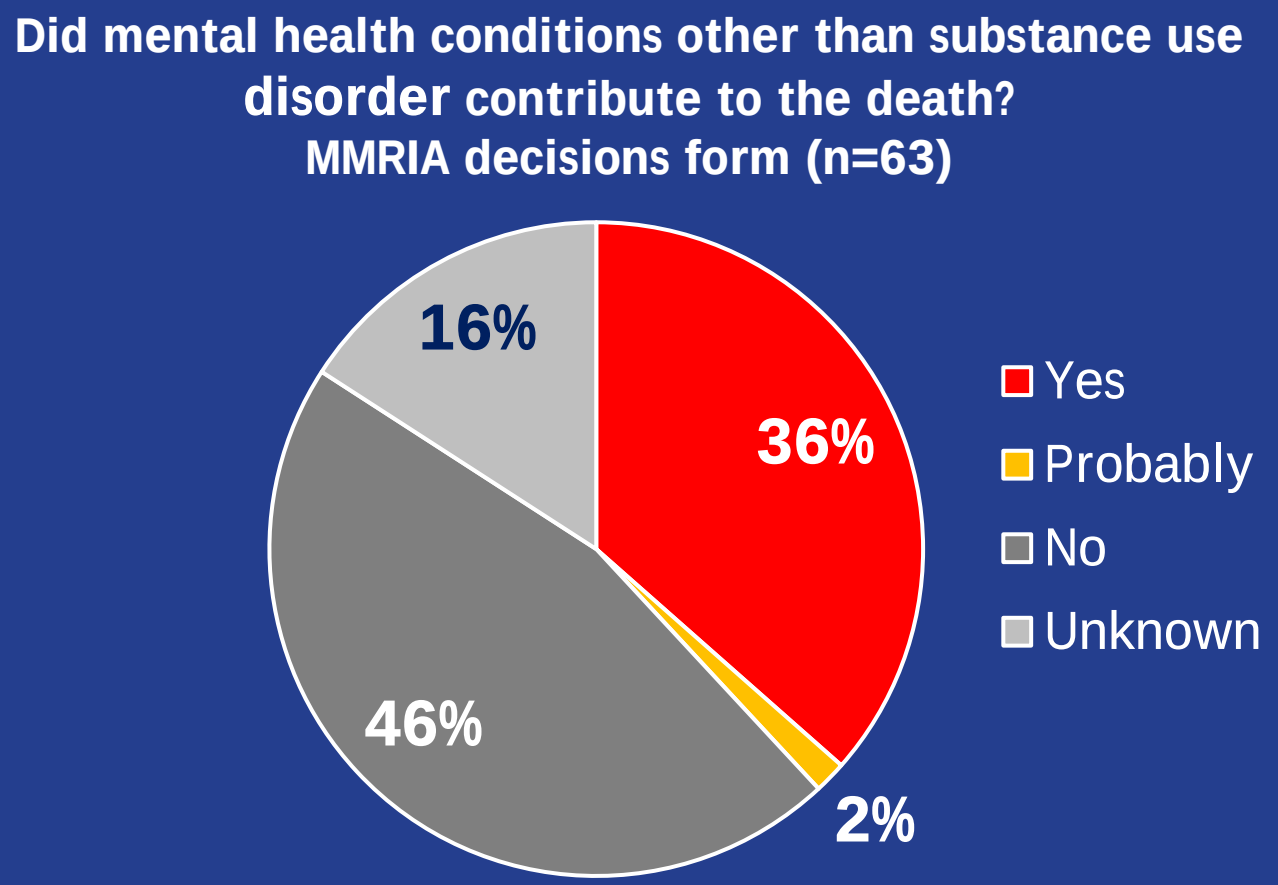
Contributing Factors: Substance Use Disorder

Substance use disorder was the most common contributing factor identified, likely contributing to over half of all pregnancy-associated deaths in 2018.



Contributing Factors: Mental Health Conditions

Mental health conditions, other than substance use disorder, also contributed significantly to **all** pregnancy-associated deaths.



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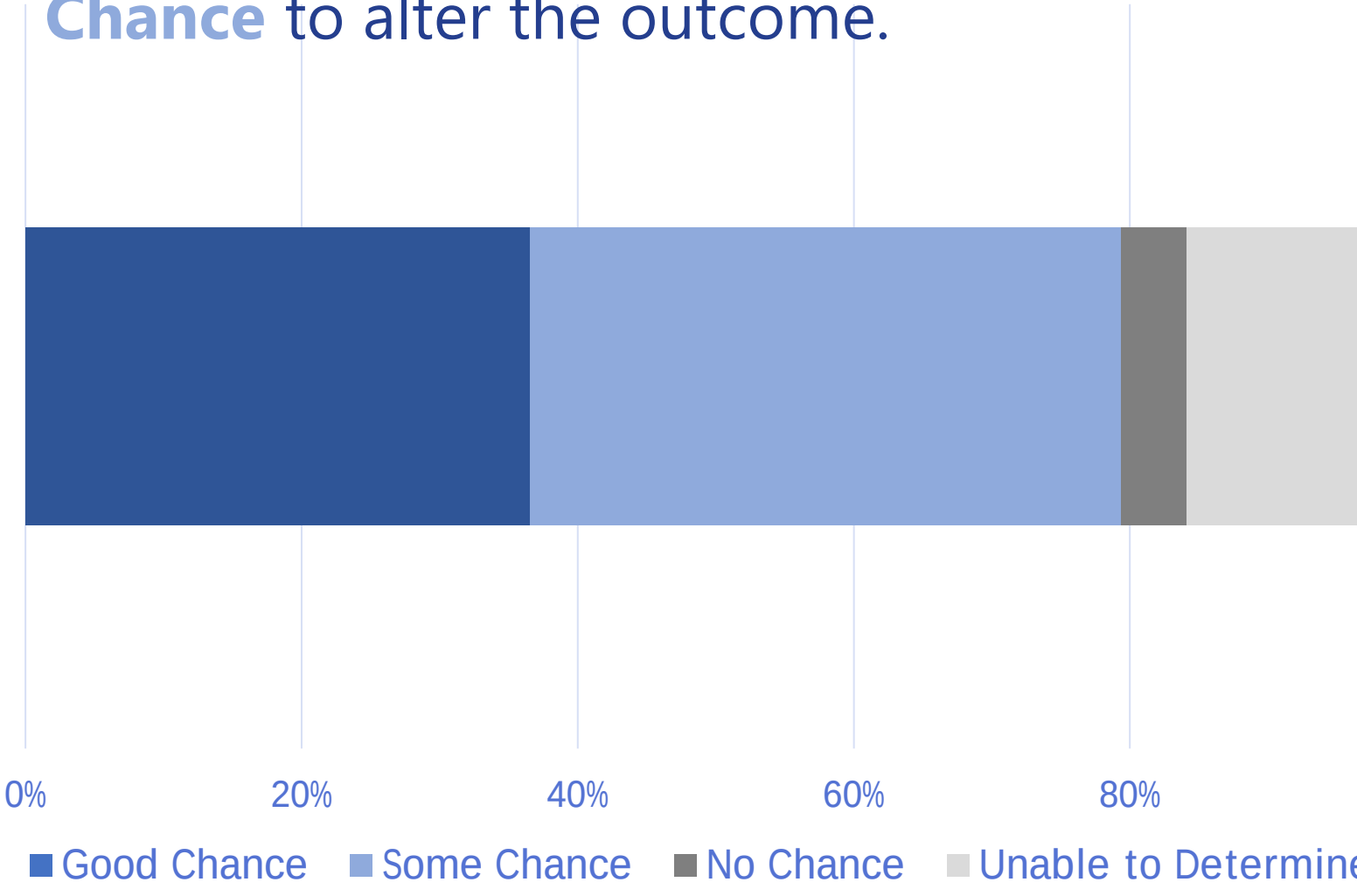
Preventability

87%

of pregnancy-associated deaths were deemed preventable by the MMRC.

Almost 80% of all pregnancy-associated death reviewed had either a **Good Chance** or **Some Chance** to alter the outcome.



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Preventability

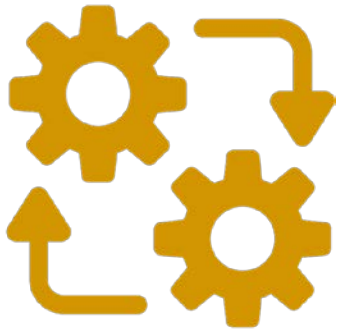
87% of all ***pregnancy-associated deaths*** were preventable.

90% of ***pregnancy-related deaths*** were preventable.

MMRC Recommendations for State of Indiana

- Indiana policy should promote a **statewide information exchange network** among Indiana providers and agencies.
- Prioritize the **AIM bundle** addressing substance use in pregnancy.
- Extend **postpartum coverage** for Medicaid clients, and include parity to ensure appropriate access to care for chronic conditions, including substance use and mental health disorders.

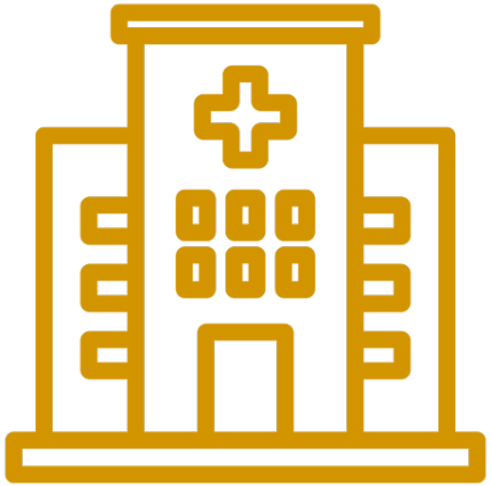
MMRC Recommendations for Systems of Care



Optimize the health and well-being of women with chronic conditions, including substance use and mental health disorders, and their infants.

- Health systems should **improve linkages** to comprehensive support and care, including treatment for substance use and mental health disorders, recovery support, housing, social isolation, and food insecurity.
- Health systems and social service providers should **standardize professional education** to include training on implicit bias and trauma-informed care.
- For women for whom pregnancy is diagnosed in the emergency department, particularly those with accompanying chronic conditions, **follow-up care with treatment and peer/recovery support** should be standard procedure.
- To reduce the burden of the patient or client attempting to receive support from health systems or social services, all providers should **automatically provide alternative resource options** for those ineligible for traditional services.

MMRC Recommendations for Facilities



- Improve **provider adherence** to ACOG heart disease and pregnancy guidelines.
- Require all post-partum discharges to include **post-birth warning education** and literature (e.g., “POST”).
- Provide **ongoing education to staff** on trauma-informed care and the impacts of compassion fatigue.

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ACOG The American College of Obstetricians and Gynecologists

MMRC Recommendations for Communities

- Create a **culture of compassion, understanding, and healing** for the mother-infant dyad affected by chronic illnesses, including mental health and substance use disorders.
  - Improve **linkages to comprehensive support** and care, including treatment for substance use and mental health disorders, recovery support, housing, social isolation, and food insecurity.
  - Become **trauma-informed.**
  - Establish **information networks** and "one-stop-shop" resource directories for families in need of services.
- Engage social service providers **in identifying families in need of assistance** accessing resources, including family planning, mental health treatment, and parenting education.
  - When possible, this care should include **warm hand-offs**, rather than simple referrals.
- Enforce state-mandated **toxicology testing** in all motor vehicle fatalities.

MMRC Recommendations for Providers

- Improve recognition of, reduce stigma of, and increase support for women with mental health and substance use disorders. This can be done through **ongoing, targeted training** to more easily recognize and address chronic conditions and **increased awareness of stigma** and its effect on treatment and recovery.
- Increase **education** for and **awareness of mental health** diagnoses for primary care and emergency department providers.
- Increase adherence to **protocol for controlling hypertension**, both during and after pregnancy.
- Increase **awareness of and connectivity to navigation programs** that assist with resources, such as home visiting.

MMRC Recommendations for Patients/Families

- **Increase awareness about intimate partner violence** and the public duty to inform in situations where victims are in danger.
- Understand the **challenges of maintaining recovery** for patients being discharged from substance use treatment programs.
  - **Immediate connection** to outpatient recovery services should be offered, and follow-up care should be standard.
  - Support should include **connectivity to social support services**, recovery networks, and activities to support recovery.
  - Families and women in recovery should have **naloxone available** and understand its use.