



MATERNAL SEPSIS

September 30, 2020

CONTINUING EDUCATION

- The link for the evaluation of today's program is:
<https://www.surveymonkey.com/r/Sepsis--9-30-2020>
- Please be sure to access the link, complete the evaluation form, and request your certificate. The evaluation process will remain open **two weeks** following the webcast. Your certificate will be emailed to you when the evaluation process closes after the 2 week process.
- If you have any questions please contact Dorothy Aldridge (Dorothy.Aldridge@ohiohospitals.org)

SEPSIS WEBSITE

ohiohospitals.org/sepsis



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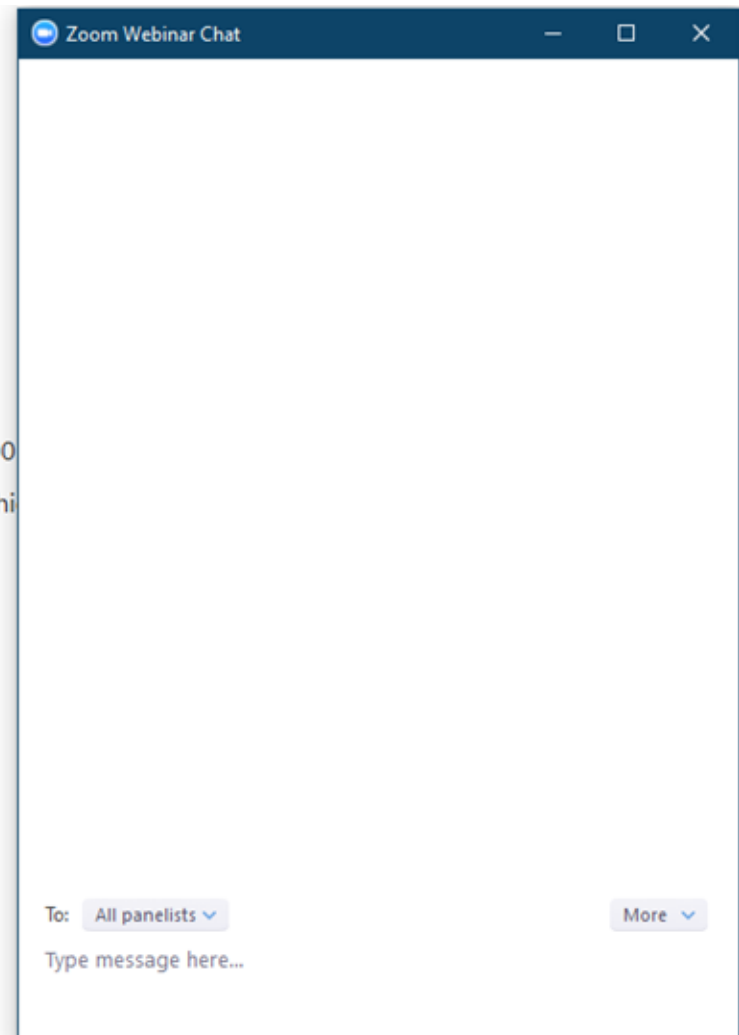
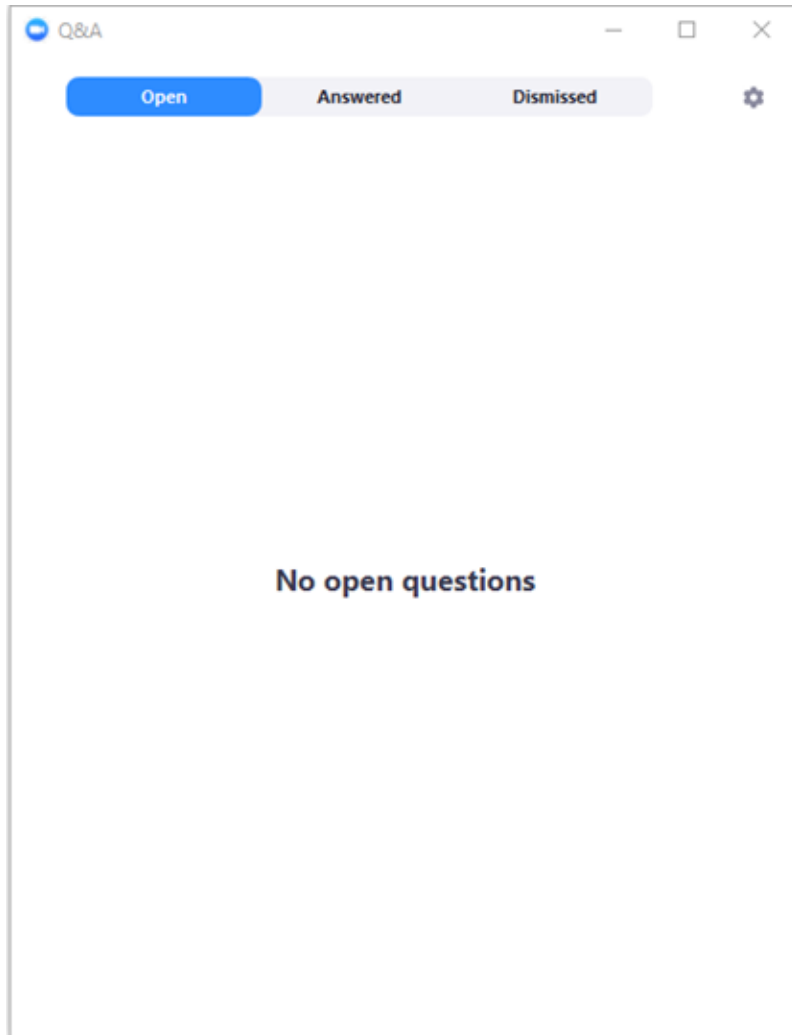


Sepsis

Reducing Sepsis Mortality in Ohio Through Early Recognition, Appropriate Intervention

The OHA Board of Trustees identified reducing sepsis mortality in Ohio as one of the key focus areas for OHA and Ohio hospitals. Sepsis is the body's overwhelming and life-threatening response to infection that can lead to tissue damage, organ failure and death. In other words, it's your body's over active and toxic response to an infection. Sepsis impacted an estimated 41,000 Ohioans in 2017. Early recognition and treatment can reduce the morbidity and mortality of sepsis.

SUBMITTING QUESTIONS





Saving Lives Together



Tom Heymann
Executive Director
Sepsis Alliance

About Sepsis Alliance



Carl Flatley, DDS, MSD, Sepsis Alliance founder, with daughter Erin, a victim of sepsis

Started out of personal tragedy, national need
Nation's first (2007) and leading sepsis organization
GuideStar Platinum Rated (501c3)
Focus on Education

Vision: A world in which no one is harmed by sepsis.

Mission: Save lives and reduce suffering by improving sepsis awareness and care.

Happy Sepsis Awareness Month

Congratulations to OHA – 2020 Sepsis Hero!!!



Maternal Sepsis: The Burden



- The U.S. has the third highest rate of maternal mortality of all high-income countries
- 12.5% of maternal deaths in the U.S. are related to infection/sepsis
- Sepsis is driving increases in pregnancy-related deaths in the U.S.
 - Per CDC, infection/sepsis is the 3rd leading cause of pregnancy-related death
- **Disparities** in mortality from pregnancy-related causes:
 - Black women are 3.3x more likely to die than white women
 - Native American and Native Alaskan women are 2.5x more likely die than white women

Patient Education Resources



SEPSIS ALLIANCE SEPSIS BASICS EDUCATION GET INVOLVED ABOUT EVENTS SHOP **DONATE**

Pregnancy & Childbirth

Although pregnancy is the same for women worldwide, their safety varies greatly depending on where the women live and the type of medical care they receive, if any.

Sepsis is an illness that can develop in some pregnant women, as well as in women and babies. Sepsis that occurs during pregnancy is called maternal sepsis. If it develops during pregnancy, it is called postpartum sepsis or puerperal sepsis. Sometimes incorrectly called blood poisoning, it is a life-threatening inflammatory response to infection. Sepsis kills and disables millions, more than any other infectious disease.

Sepsis and septic shock can result from an infection anywhere in the body, such as a urinary tract infection (UTI), pneumonia, or skin infections. Worldwide, one-third of people who develop sepsis die. Many who do survive have long-term complications such as **post-traumatic stress disorder (PTSD)**, chronic pain and fatigue, organ dysfunction, and/or **amputations**.

Maternal and postpartum sepsis are more common in the developing countries, but they are also common in developed countries, including in the United States. According to the **Centers for Disease Control and Prevention**, in 2013 infection or sepsis caused 12.7% of pregnancy-related deaths in the United States. Early detection, accurate diagnosis, and aggressive treatment. In fact, a recent study reported that "Sepsis is currently the leading cause of direct maternal death in the United States."



Maternal Sepsis Signs & Symptoms

What to look out for if you are pregnant or recently gave birth:

- Fever above 100.4 F
- Difficulty breathing or shortness of breath
- Foul smelling discharge from the vagina or a wound
- Chest pain
- Feeling confused or just "not right"
- General abdominal pain that appears, or gets much worse suddenly

If you experience a combination of these symptoms, call 911, or seek emergency care and say, "I'm concerned about sepsis!"

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For more information, please visit sepsis.org



Pregnancy & Childbirth and Sepsis

Maternal sepsis is a leading cause of pregnancy-related deaths in the United States.

What is maternal sepsis? It is a life-threatening condition defined as organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion or miscarriage, or postpartum period. Early recognition of sepsis is key to saving mothers' lives.

What to look out for if you are pregnant or recently gave birth:

- Fever above 100.4 F
- Foul smelling discharge from the vagina or a wound
- Difficulty breathing or shortness of breath
- Chest pain
- Feeling confused or just "not right"
- Non-specific or general abdominal pain that appears, or gets much worse suddenly

If you experience a combination of these symptoms, call 911, or seek emergency care and say, "I'm concerned about sepsis!"

Watch out for urinary tract infections (UTI) as they are a common cause of maternal sepsis.

Risk Factors:

You are at a greater risk of developing maternal sepsis if you have:

- Diabetes
- Mastitis (inflammation and/or infection in the breast tissue)
- Viral or bacterial infection, such as a UTI

***Obesity may also increase your risk of developing sepsis.**

Or had:

- A cesarean section
- Prolonged or obstructed labor
- Premature ruptured membranes
- Cerclage (cervical stitch)
- Placental abruption (placenta breaks away from the uterine wall)
- Emergency surgery
- Miscarriage, or induced abortion
- Limited or no prenatal care

For more information, please visit sepsis.org

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Patient Education Resources



- Spanish resources: tri-fold, infographic, sepsis information guide
- Coming soon: sepsis and pregnancy education video and PSA in Spanish

SEPSIS, EMBARAZO Y PARTO

Aunque el embarazo es el mismo para las mujeres en todo el mundo, su seguridad varía mucho según el lugar donde viven y el tipo de atención médica que reciben, si es que la tienen. La sepsis es una afección que puede desarrollarse en mujeres embarazadas, así como en mujeres que han dado a luz recientemente un bebé o más de uno, o que han tenido un aborto espontáneo o inducido.

Algunas veces, se llama incorrectamente intoxicación sanguínea, sin embargo la sepsis es la respuesta del organismo a una infección que pone en peligro la vida. Afecta a 1.7 millones de personas en los Estados Unidos cada año.

La sepsis materna también solía ser conocida por otros términos, como sepsis posparto o puerperal. A los expertos les preocupaba que esto pudiera ser confuso, por lo que la Organización Mundial de la Salud (OMS) sugiere que se use el término "sepsis materna" para toda la sepsis que afecta a las mujeres embarazadas y a las nuevas madres.

La sepsis materna es más común en los países en desarrollo, pero también afecta a las mujeres en los países desarrollados, incluyendo los Estados Unidos. Según los Centros para el Control y la Prevención de Enfermedades, entre 2011 y 2013 la infección o sepsis causó el 12.7% de las muertes relacionadas con el embarazo en los EE. UU. El estudio también informa que "la sepsis es actualmente la principal causa de muerte materna directa en el Reino Unido". Un tercio de las personas que desarrollan sepsis a nivel mundial mueren. Muchos de los que sobreviven se quedan con efectos que cambian la vida, como el Trastorno por Estrés Posttraumático (TEPT), dolor crónico y fatiga, disfunción de los órganos (los órganos no funcionan correctamente) y/o amputaciones.

¿POR QUÉ OCURRE LA SEPSIS?

La sepsis puede ocurrir debido a una infección relacionada con el embarazo y el parto, o no relacionada, como neumonía o una infección del tracto urinario (ITU). Las infecciones más comunes que desencadenan la sepsis materna son causadas por bacterias como la E. coli.

La sepsis puede desarrollarse como resultado de complicaciones. Aquí hay algunas:

- **Abortos espontáneos o abortos inducidos:** Las infecciones son un riesgo después de cualquier sea espontáneo o inducido. Los abortos no estériles (los que se pueden realizar fuera de un centro) representan un riesgo particular. Las mujeres que han tenido uno deben estar atentas a los signos y síntomas de una infección.
- **Cesáreas:** La sepsis puede desarrollarse después de cualquier tipo de cirugía. Las cesáreas son cirujías abdominales mayores con todos los riesgos asociados.
- **Trabajo de parto prolongado u obstruido:** Un trabajo de parto inusualmente largo o que no progresa.
- **Ruptura de membranas:** Cuanto más prolongado sea el período entre el "rompimiento de la bolsa" y el nacimiento del bebé, mayor será la posibilidad de infección.
- **Infección seguida de parto vaginal:** Poco común, las mujeres que dan a luz en centros de salud en los países desarrollados. Sin embargo, las infecciones son comunes en países en desarrollo.
- **Mastitis:** La infección de las mamas puede desencadenar la sepsis.

Sepsis En El Parto Y Embarazo

La sepsis materna es una de las principales causas de muertes relacionadas con el embarazo en los Estados Unidos.

¿Qué es la sepsis materna? Es una afección potencialmente mortal definida como disfunción de los órganos como resultado de una infección durante el embarazo, el parto, el aborto o aborto espontáneo, o el período posparto. El reconocimiento temprano de la sepsis es clave para salvar la vida de las madres.

Qué debe tener en cuenta si está embarazada o ha dado a luz recientemente:

Fiebre superior a 100.4 F	Secreción maloliente de la vagina o una herida	Dificultad para respirar o falta de aire	Dolor de pecho	Sentirse confundida o simplemente "no estar bien"	Dolor abdominal no específico o general que aparece, o empeora mucho de repente
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Si experimenta una combinación de estos síntomas, llame al 911 o busque atención de emergencia y diga "¡Creo que puedo tener sepsis!"

Tenga cuidado con la infección del tracto urinario (ITU), ya que es una causa común de sepsis materna.

Factores de riesgo:

Usted corre un mayor riesgo de desarrollar sepsis materna si tiene: <ul style="list-style-type: none">• Diabetes• Mastitis (inflamación y/o infección del tejido mamario)• Infección viral o bacteriana, como una ITU <p>*La obesidad también puede aumentar su riesgo de desarrollar sepsis.</p>	O ha tenido: <ul style="list-style-type: none">• Una cesárea• Trabajo de parto prolongado o obstruido• Ruptura prematura de membranas• Cercaje (suturas o puntos al cuello del útero)• Desprendimiento de la placenta (la placenta se separa de la pared uterina)• Cirugía de emergencia• Aborto espontáneo o aborto inducido• Cuidado prenatal limitado o ausente
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Patient Education Videos



Maternal Sepsis Week



- Annual observance to raise awareness of the unique signs and symptoms of maternal sepsis,
- Bring to life the personal experiences of the women who endured it
- Remember those who have passed
- Resources for the public, providers, policy leaders
- May 9-15, 2021



Provider Education and Training



- Sepsis & Pregnancy Training Module with CNE and CME, in partnership with ACOG District II – coming soon to Sepsis Alliance Institute!
- www.sepsisinstitute.org



Patient Story



Together We Can Make Our Nation “SEPSIS SAFE”
Thank You!



SEPSIS
ALLIANCE

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Professor, Obstetrics and Gynecology
Department of Obstetrics and Gynecology
The Ohio State University Wexner Medical Center



Pregnancy-Related Mortality In Ohio Due to Sepsis

Cynthia S. Shellhaas, MD, MPH

Outline for Today's Talk

- Overview of Maternal Mortality Review Committees
- Definitions
- Maternal mortality in Ohio: General Data
- Ohio Sepsis-related Mortality Data
- Sepsis: Pregnancy Considerations
- Initiatives

National Maternal Mortality Data Sources

	CDC – National Center for Health Statistics (NCHS)	CDC – Pregnancy Mortality Surveillance System (PMSS)	Maternal Mortality Review Committees
Data Source	Death certificates	Death certificates linked to fetal death and birth certificates	Death certificates linked to fetal death and birth certificates, medical records, social service records, autopsy, informant interviews...
Time Frame		During pregnancy – 365 days	During pregnancy – 365 days
Source of Classification		Medical epidemiologists (PMSS-MM)	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	M	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	Sh for international comparison	Analyze clinical factors associated with deaths, publish information that may lead to prevention strategies	Understand medical and non-medical contributors to deaths, prioritize interventions that effectively reduce maternal deaths

Known to provide inaccurate data since based solely on pregnancy checkbox on the death certificate

Nicely reviewed in:

- Callaghan, William M. 2012. Overview of maternal mortality in the United States. Seminars in perinatology. 36; 1: 2-6.
- Berg C, et al. (Editors). Strategies to reduce pregnancy-related deaths: from identification and review to action. Atlanta: Centers for Disease Control and Prevention; 2001

National Maternal Mortality Data Sources

	CDC – National Center for Health Statistics (NCHS)	CDC – Pregnancy Mortality Surveillance System (PMSS)	Maternal Mortality Review Committees
Data Source	Death certificates	<div style="border: 2px solid purple; border-radius: 20px; padding: 10px; text-align: center;"> <p>Basis of current national data, but missing preventability, contributing factors, recommendations to prevent future deaths</p> </div>	Death certificates linked to fetal death and birth certificates, medical records, social service records, autopsy, informant interviews...
Time Frame	During pregnancy – 42 days		During pregnancy – 365 days
Source of Classification	ICD-10 codes		Multidisciplinary committees
Terms	Maternal death		Pregnancy associated, (Associated and) Pregnancy related, (Associated but) Not pregnancy related
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	Show national trends and provide a basis for international comparison		Understand medical and non-medical contributors to deaths, prioritize interventions that effectively reduce maternal deaths

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Slide courtesy of CDC

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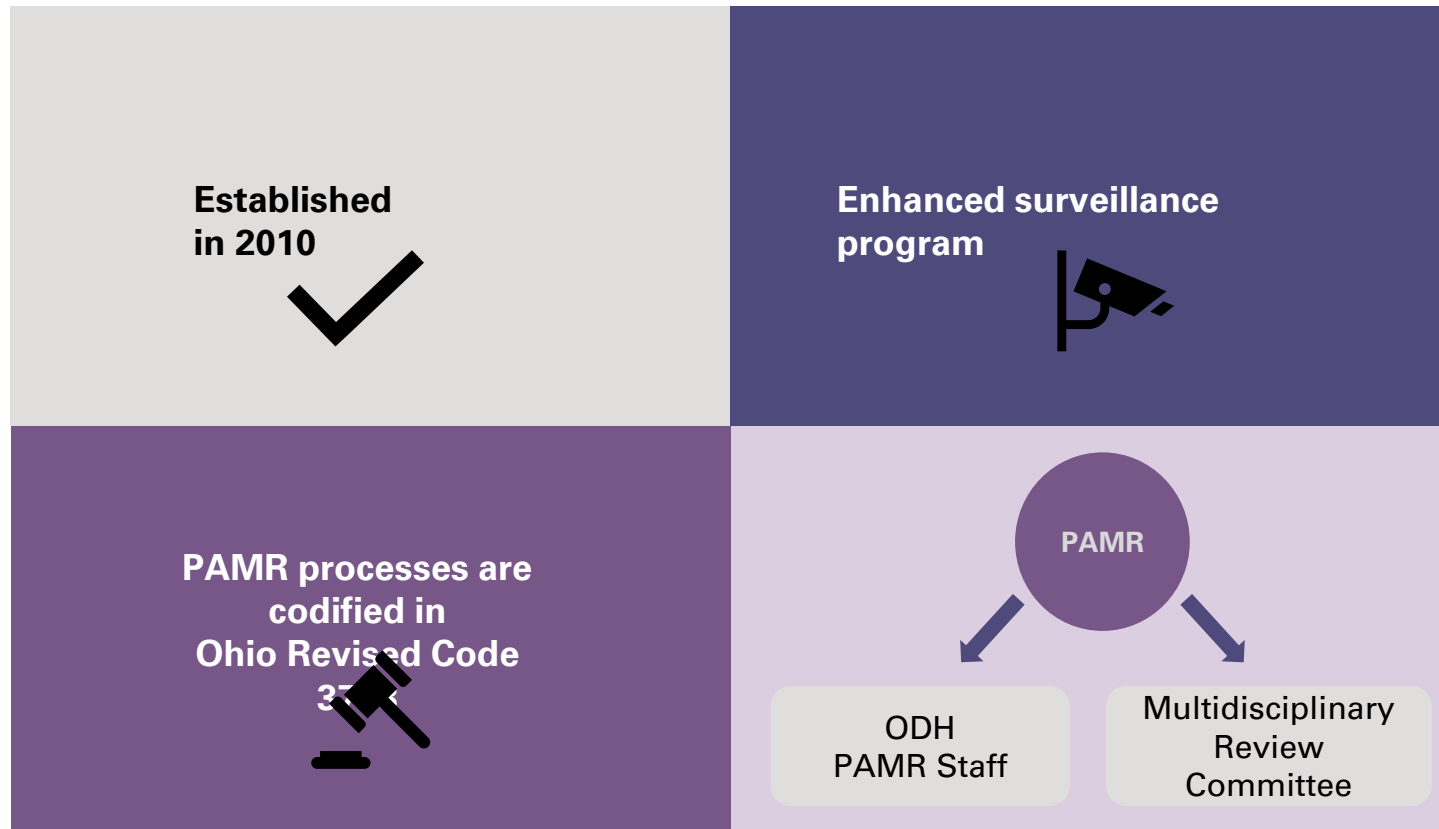
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*Slide courtesy of
CDC*

Public Health 101: Surveillance

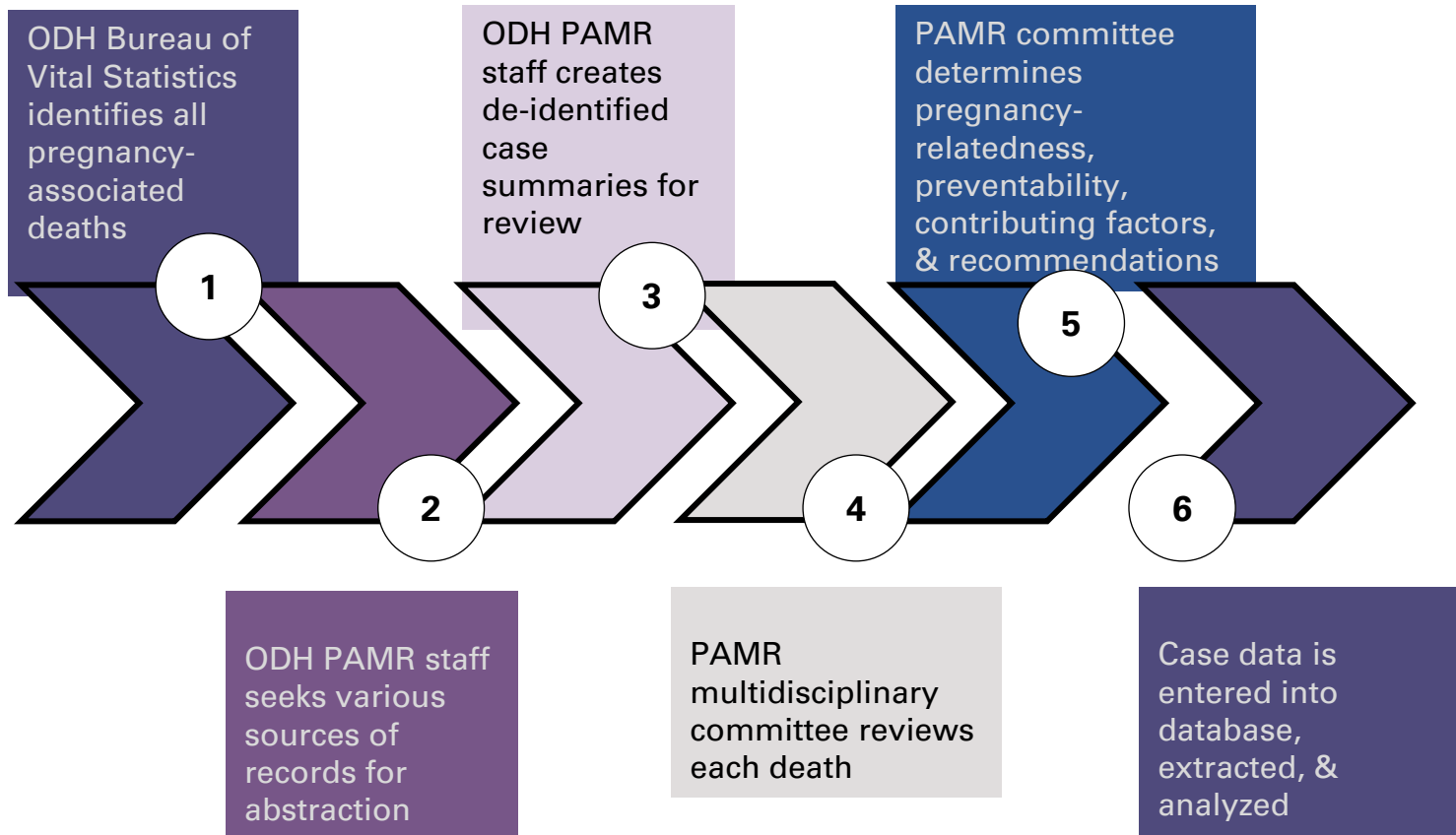
- “**Surveillance** and data are the foundation of public health practice.”
 - <https://www.cdc.gov/surveillance/index.html>
- The key objective of **surveillance** is to provide information to guide interventions.
 - www.ncbi.nlm.nih.gov/books/NBK11770/
- Public health **surveillance** is “the ongoing, systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice.”
 - <https://www.cdc.gov/publichealth101/surveillance.html>

What is PAMR?



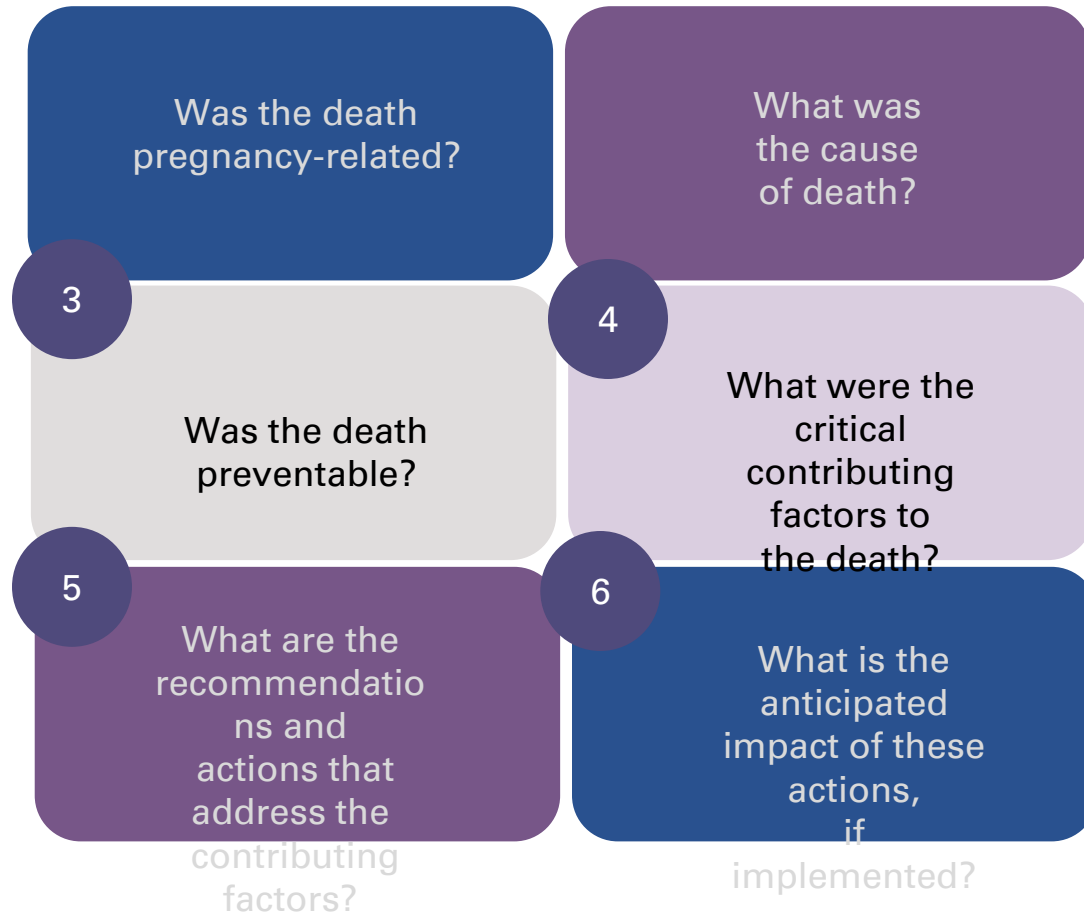
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The PAMR Process



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PAMR Committee: Six Key Decisions



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Review to Action: www.reviewtoaction.org

REVIEW TO ACTION
WORKING TOGETHER TO PREVENT
MATERNAL MORTALITY

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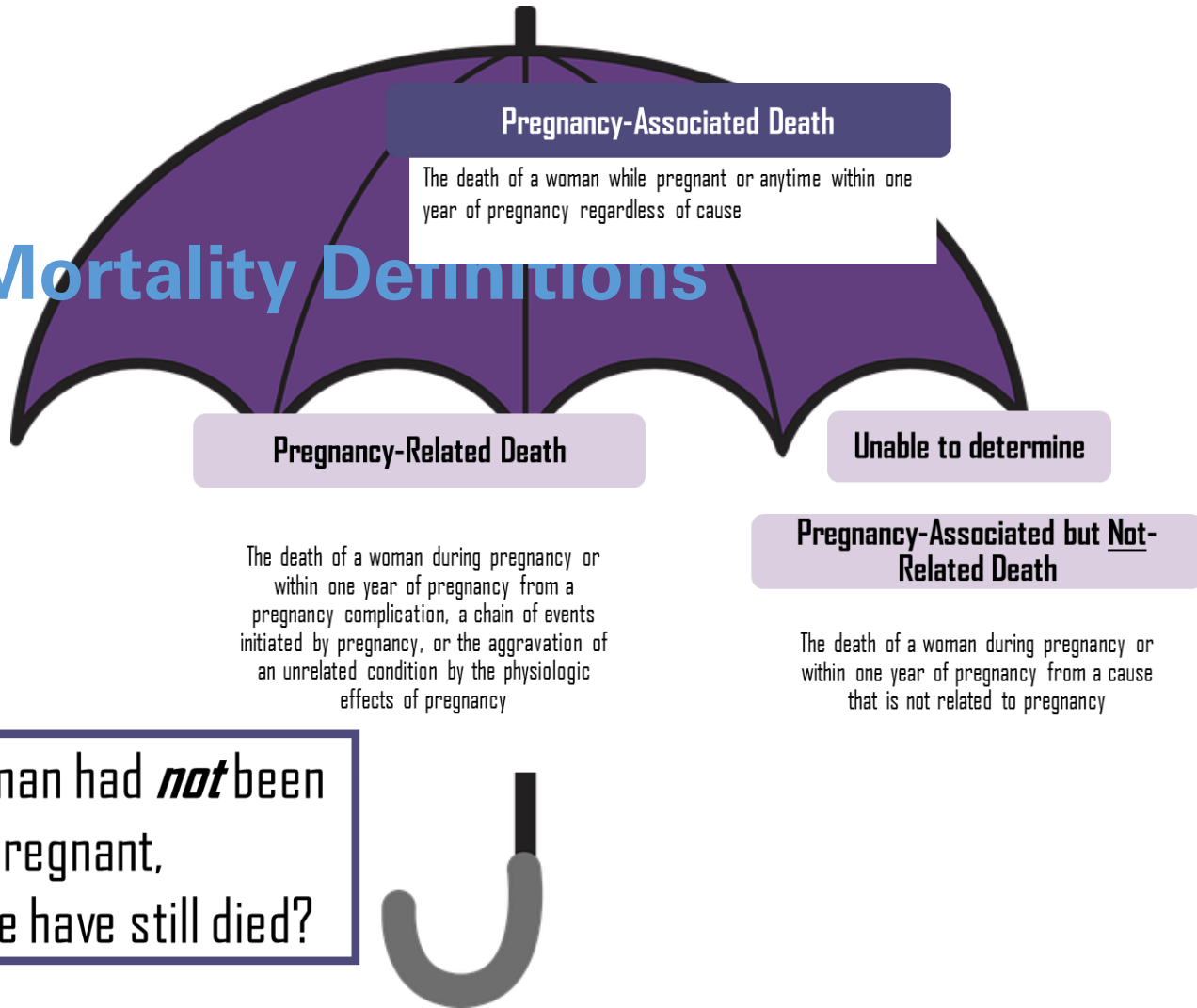
REVIEW TO ACTION
PROMOTES THE MATERNAL
MORTALITY REVIEW
PROCESS AS THE BEST
WAY TO UNDERSTAND
WHY MATERNAL
MORTALITY IN THE UNITED
STATES IS INCREASING
AND PRIORITIZE
INTERVENTIONS TO
IMPROVE MATERNAL
HEALTH.

Experience a Maternal Mortality
Review Committee In Action

MMRC Example: Review of a Cardiomyopathy Death www.reviewtoaction.org/mock-panel

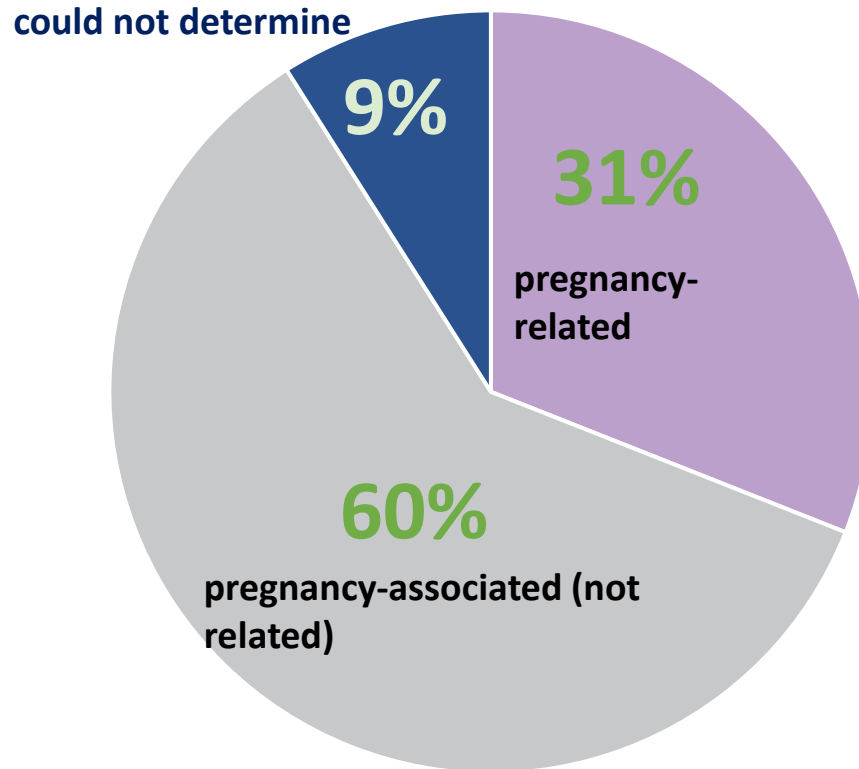
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Maternal Mortality Definitions



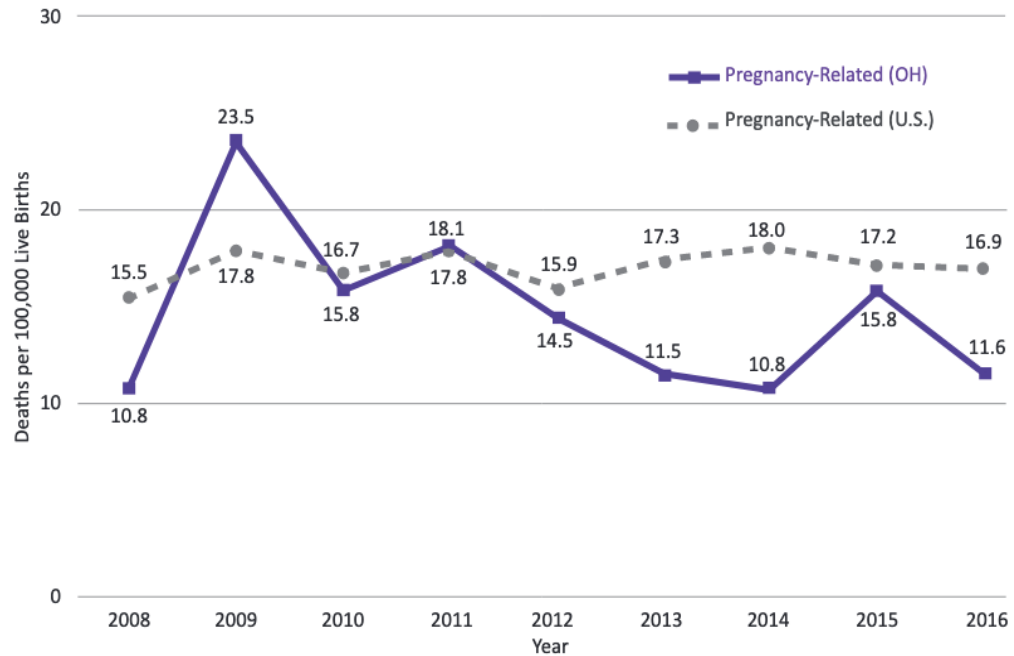
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2008-2016: 610 Pregnancy-Associated Deaths



Ohio and US Pregnancy-Related Mortality Ratios, 2008-2016

Rate of deaths did not change significantly in Ohio or the U.S.

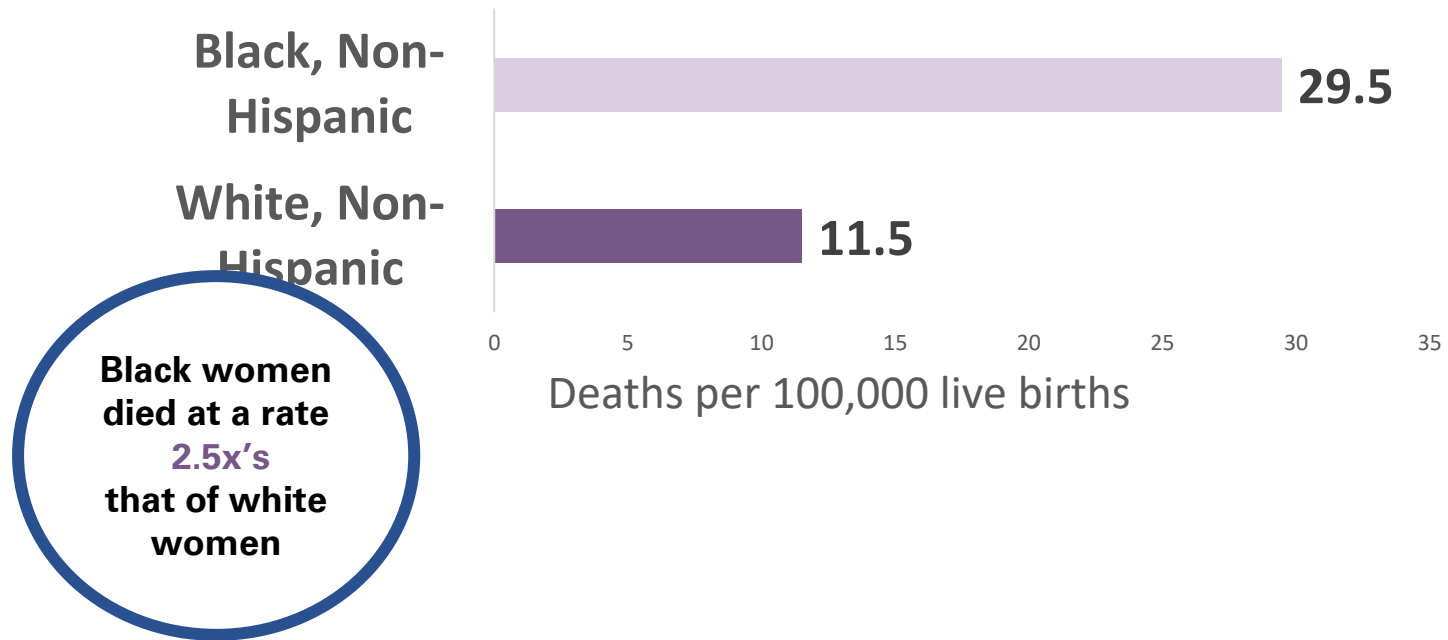


Caution should be used in comparing U.S. and Ohio ratios as surveillance methods



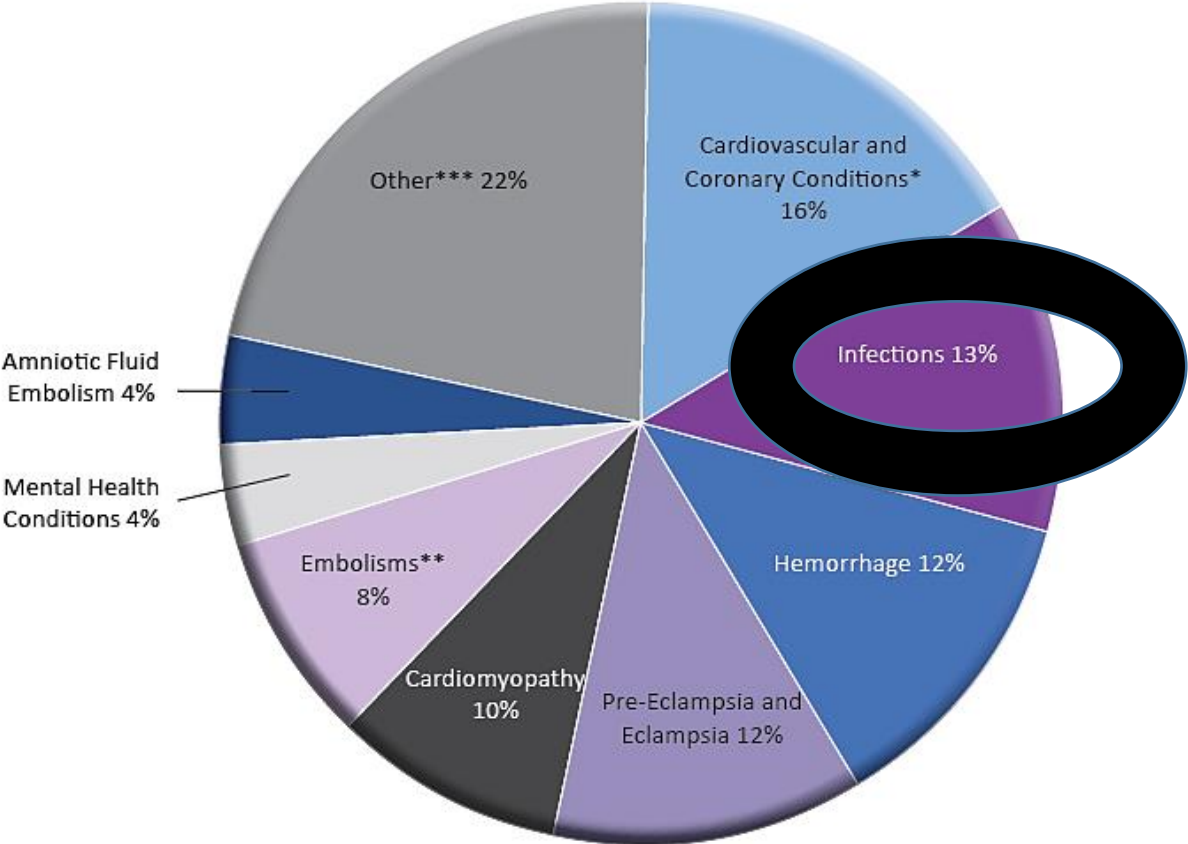
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Disparities in Pregnancy-Related Deaths by Race



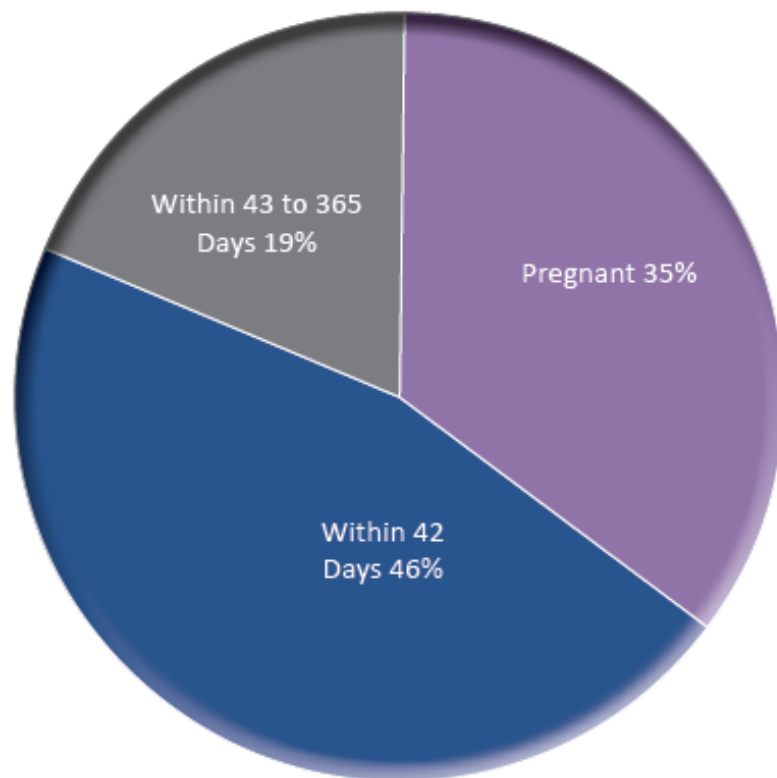
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Causes of Pregnancy-Related Deaths, Ohio 2008-2016



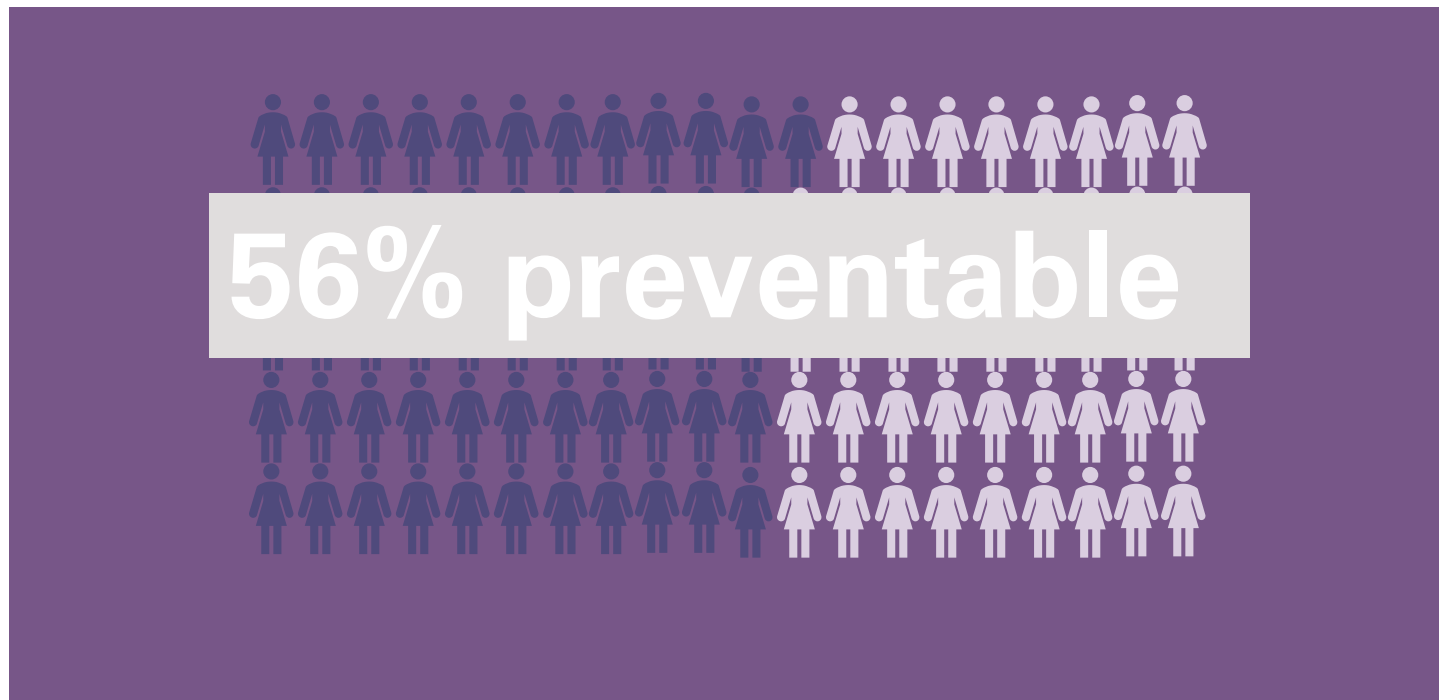
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Timing of Pregnancy-Related Death in Relation to Pregnancy, Ohio 2008-2016



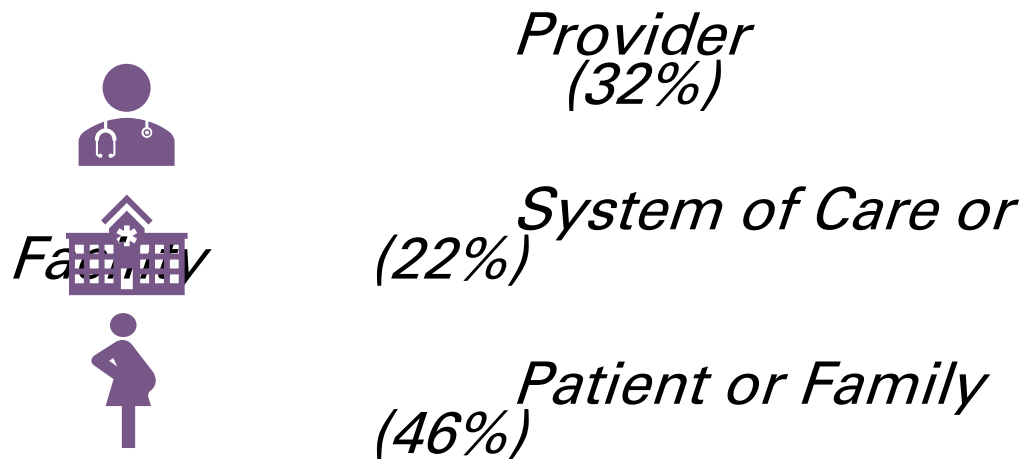
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Chance to Alter Outcome Among Pregnancy-Related Deaths (n=89), Ohio 2012-2016



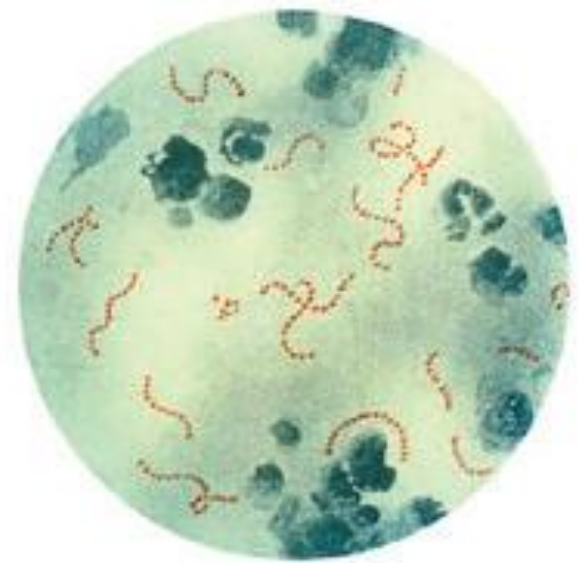
Contributing Factors

- Factors identified that contributed to the death
- **Four** factors on average were identified for every pregnancy-related death



Sepsis in Pregnancy

Ohio Data: 2008-2016



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Vignette

- “Erica” was a 25-year-old woman who had been pregnant four times resulting in three children and a miscarriage. Her medical history was significant for morbid obesity (BMI=56.5). Her prenatal course was uncomplicated.
- ***Delivery Hospitalization:*** At term, her water broke and she delivered vaginally 10 hours later. No complications. She was discharged home on PPD 2.
- ***Postpartum Period:*** The next day Erica felt ill and 911 was called. Although she had no fever, her blood pressure was low and heart rate was high. She weighed 350 pounds and required extra personnel and 43 minutes to ready her for transport. A large cuff was not available, which compromised evaluation of her blood pressure. She presented to the hospital nine minutes later. Erica was initially evaluated for hemorrhage since she was bleeding vaginally; there was a delay of several hours in identifying sepsis and beginning antibiotics. She died 18 hours after admission.
- The death certificate cause of death was **Group A Streptococcus sepsis** with disseminated intra-vascular coagulation.

What were the Factors that Contributed to this Death?	What are the Recommendations and Actions that Address those Contributing Factors?
Delay in Diagnosis (Systems Level)	Educate providers and patients on recognition, treatment, and prevention of sepsis: <ul style="list-style-type: none"> • All maternity units (includes operating room / recovery room / postpartum / emergency department) should adopt specific management plan for sepsis that includes: <ul style="list-style-type: none"> o Readiness (e.g. checklists, drills, huddles, and post event debriefings) o Recognition of at-risk patients o Institution of prevention strategies o Escalation of care, if needed o Monitoring of outcomes • Provide discharge education to patients on signs and symptoms that require attention • Partner with the Ohio Hospital Association Sepsis Network for prevention and management strategies
Use of Ineffective Treatment (Provider Level)	Encourage the use of known standards of care
Inadequate Emergency Medical Services (EMS) Response (Systems Level)	EMS should have equipment for and protocols for management of obese patients

Definition of Sepsis

- Life-threatening organ dysfunction caused by a dysregulated host response to infection
- Septic shock can be identified within a clinical construct of sepsis with persistent hypotension requiring vasopressors to maintain mean arterial pressure (MAP) 65mmHg and a serum lactate level >2mmol/L despite adequate volume resuscitation

The Third International Consensus Definitions for Sepsis and Septic Shock Task Force, 2016

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Physiologic Alterations in Pregnancy: Impact on Sepsis Diagnosis

- Sepsis cutoffs for overlapped with the normal range for pregnancy, labor, and/or the early puerperium for the following:
 - Respiratory rate
 - Heart rate
 - Partial pressure of carbon dioxide
 - White blood cell count
- Most affected by pregnancy:
 - Creatinine
 - MAP

Common Infection Sources of Sepsis

Variables	Antepartum	Postpartum
Obstetric	Septic abortion	Endometritis
	Chorioamnionitis	Wound infection
Non-obstetric	Urinary tract infection	Urinary Tract Infection
	Pneumonia	Pneumonia
	Appendicitis	Gastrointestinal

SMFM—AJOG,
2019

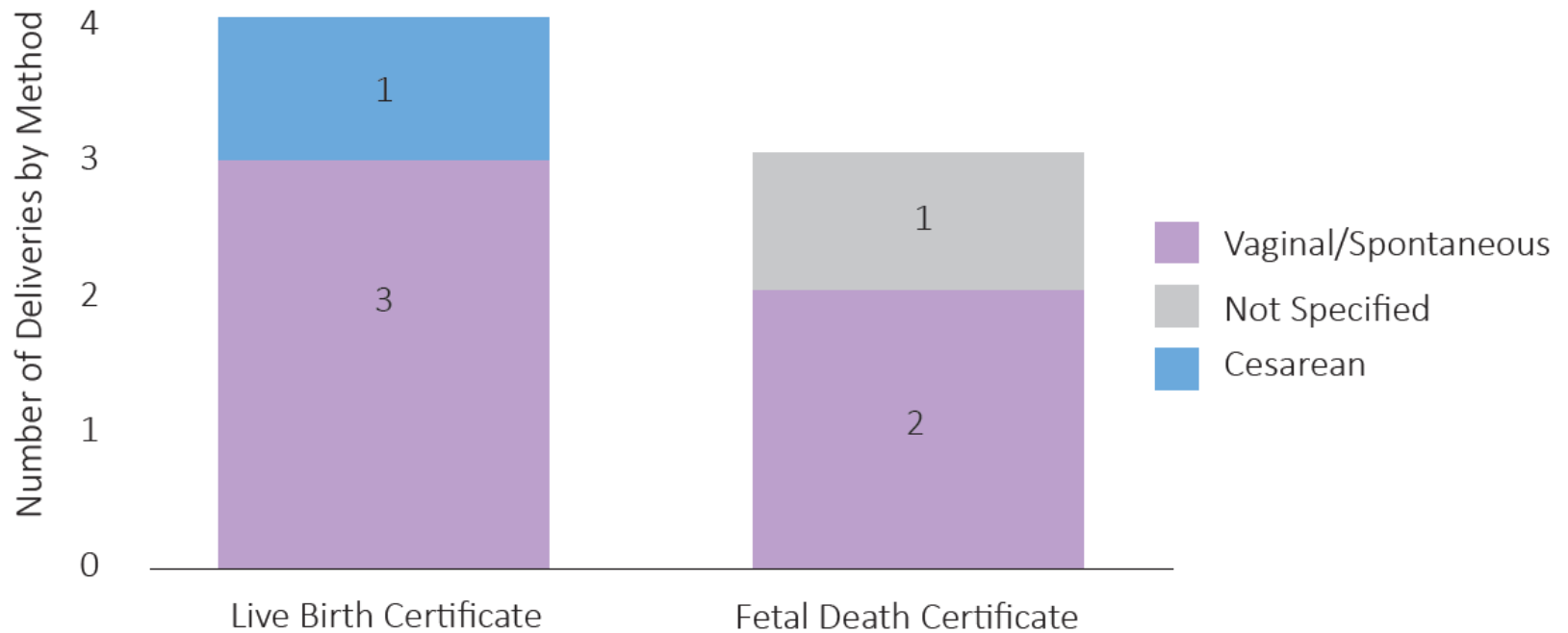
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Pregnancy-Associated Deaths due to Infection in Ohio, 2008-2016

PMSS Cause of Death	Pregnancy-Related	Pregnancy-Associated, but not Related	Unable to Determine	Pregnancy-Associated (Total)
20.1 Postpartum Genital Tract (e.g. of the Uterus/Pelvis/Perineum/Necrotizing Fasciitis)	2	0	0	2
20.2 Sepsis/Septic Shock	12	7	1	20
20.5 Non-Pelvic Infections (e.g. Pneumonia, TB, Meningitis, HIV)	8	6	1	15
20.9 Other Infections/NOS	3	1	0	4
Total	25	16	2	41

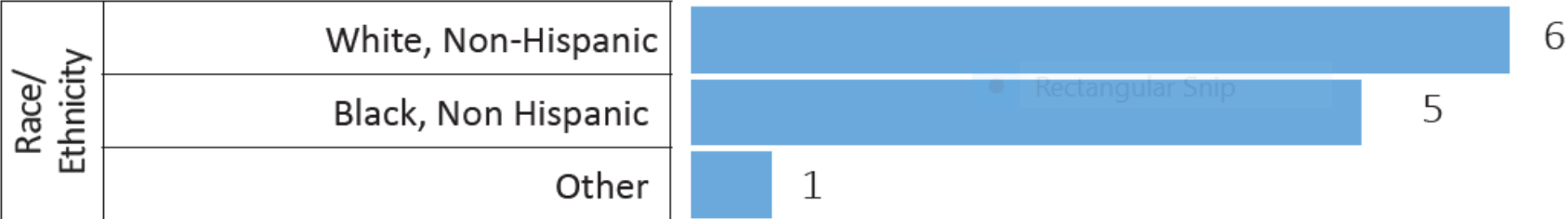
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Pregnancy-Related Deaths due to Sepsis: Ohio, 2008-2016



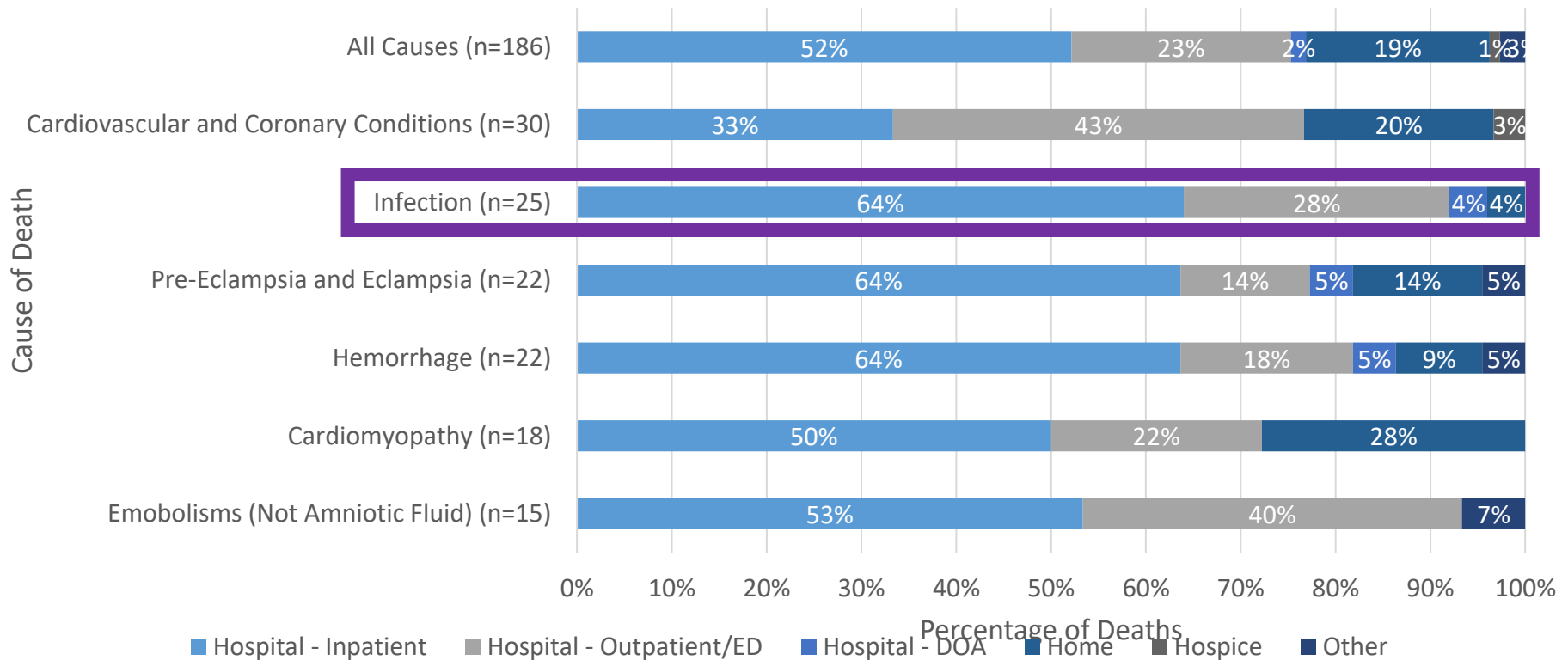
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Pregnancy-Related Deaths Due to Sepsis



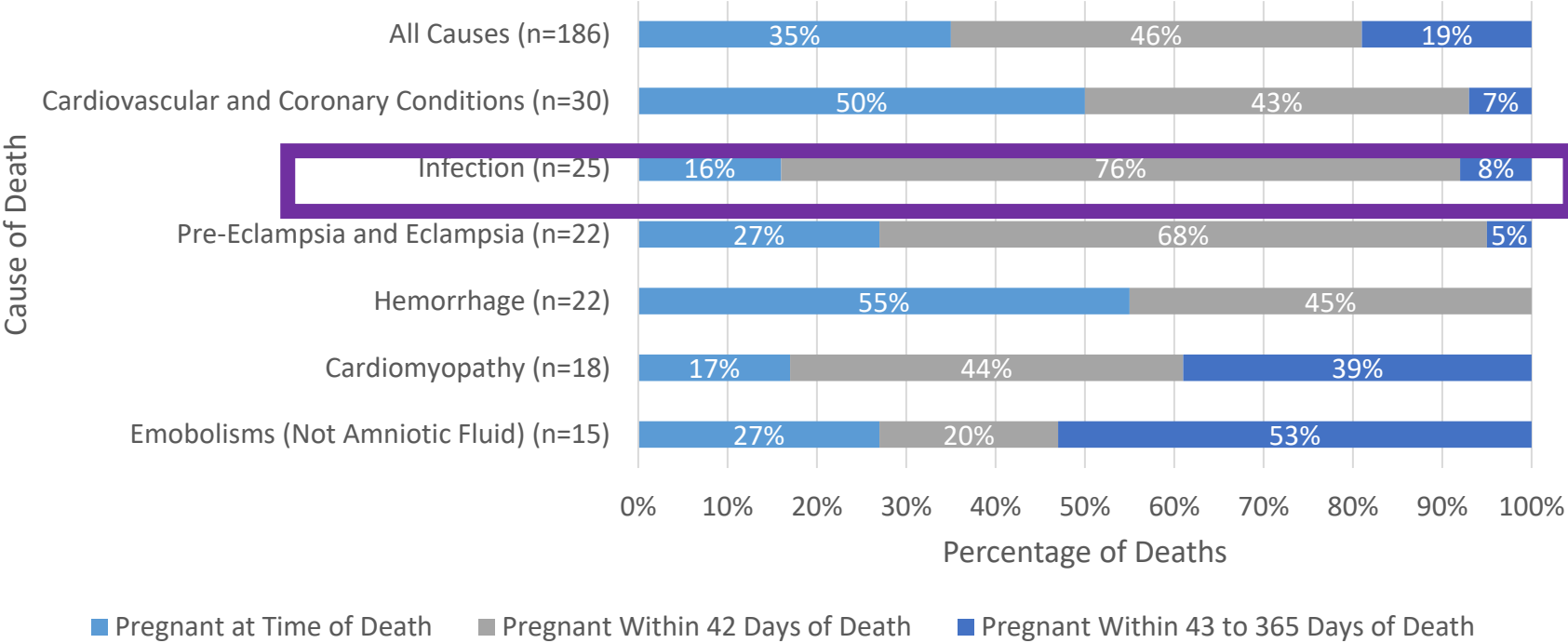
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Location of Death Among Pregnancy-Related Deaths by Leading Causes and All Causes, Ohio 2008-2016



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Timing of Death Among Pregnancy-Related Deaths by Leading Causes and All Causes, Ohio 2008-2016



Note: The "pregnant at time of death" classification includes deaths that occurred the day of delivery.

Preventability by Cause of Death, 2012-2016

Underlying Cause of Death	Preventable %
Cardiovascular & Coronary Conditions	29
Pre-eclampsia & Eclampsia	85
Hemorrhage	84
Sepsis	75
Embolisms (not AF)	56
Cardiomyopathy	75
Amniotic Fluid Embolism	20
Cerebrovascular Accidents	25
Mental Health Conditions	100

Contributing Factors

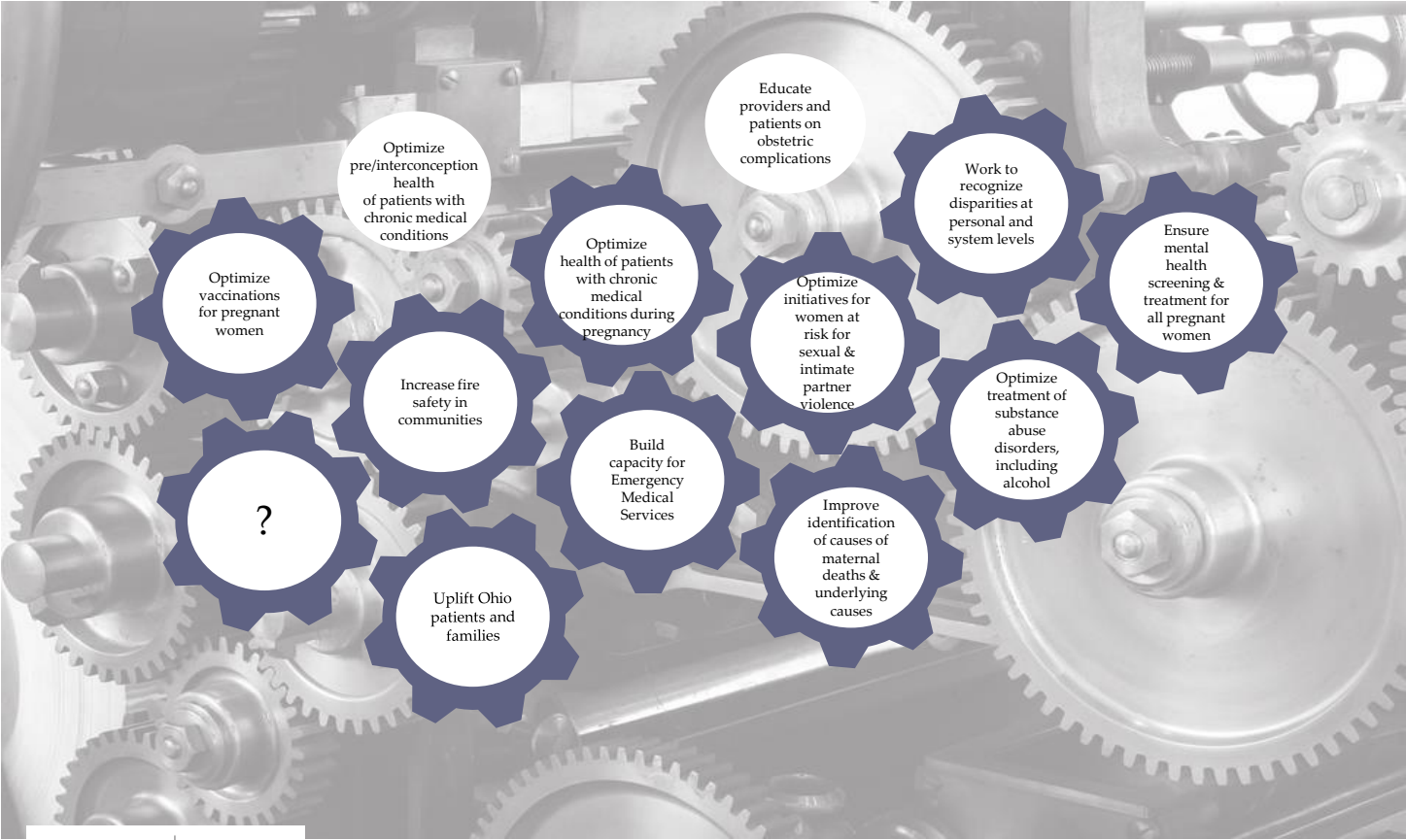
Patient	Provider	System
Chronic disease	Failure to assess risk	Inadequately trained personnel
	Use of ineffective treatment	Unavailable equipment or technology
	Delay in diagnosis and/or treatment	
	Failure to escalate care	

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Committee Recommendations for Pregnancy-Related Deaths due to Sepsis

Category	Themes
Quality of Care	Improve early pregnancy counseling and communicate risks.
	Perform sepsis screening according to sepsis protocol.
	Ensure emergency departments are equipped with necessary medications.
Protocols and Procedures	Improve communication between provider and coroner.
	Mandate facility review of all pregnancy-associated deaths.
	Create and follow a policy regarding EMS transport of pregnant women to an emergency department without OB care.
Provider Training	Equipment and transport simulation training with morbidly obese patients.
	Educate providers and patients on recognition, treatment, and prevention of sepsis.

PAMR Recommendation Areas



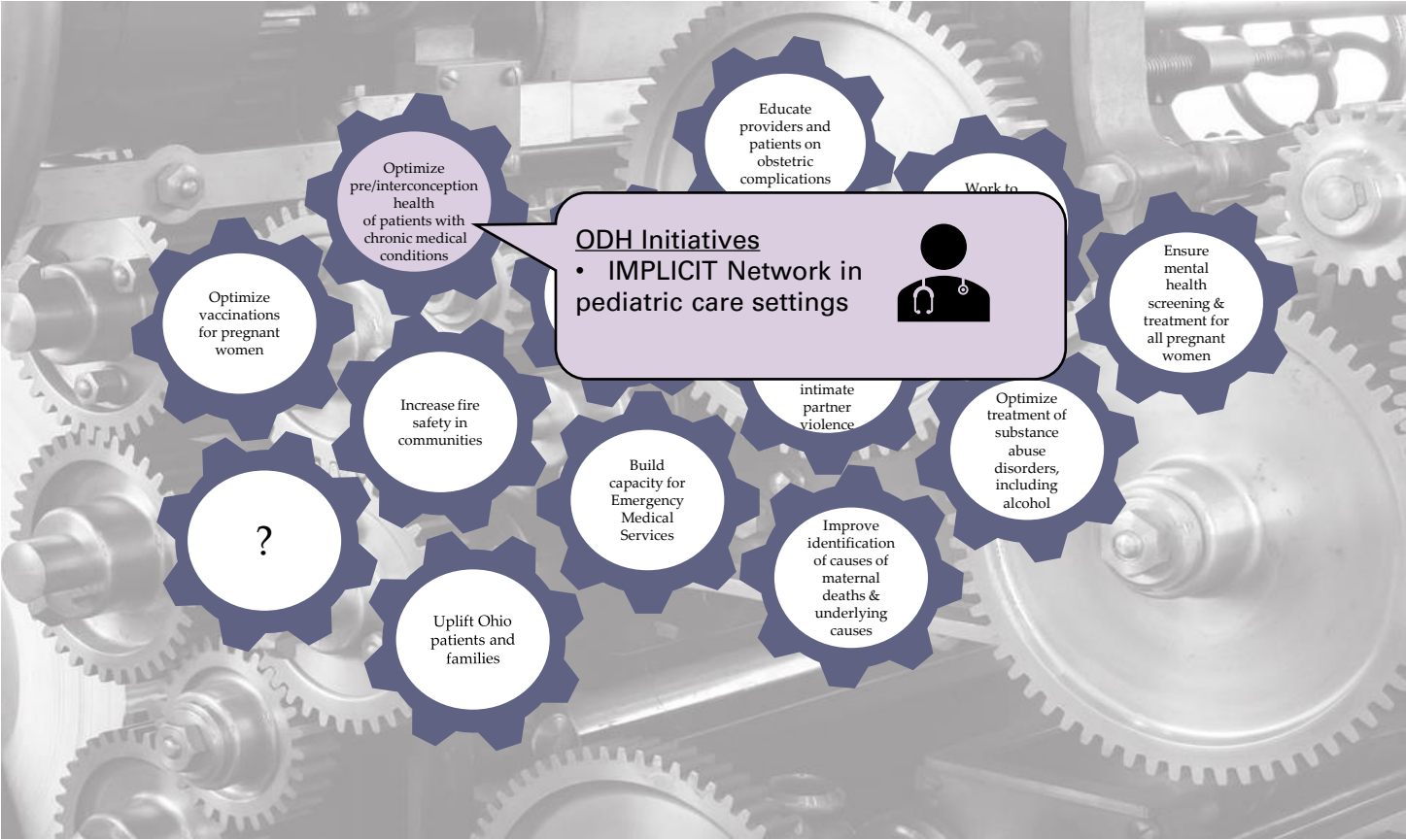
PAMR Report Recommendations

- Recommendations based on PAMR data
- In order to address recommendations, ODH applied
 - for and received two federal grants totaling over
 - \$10 million to improve maternal health in Ohio



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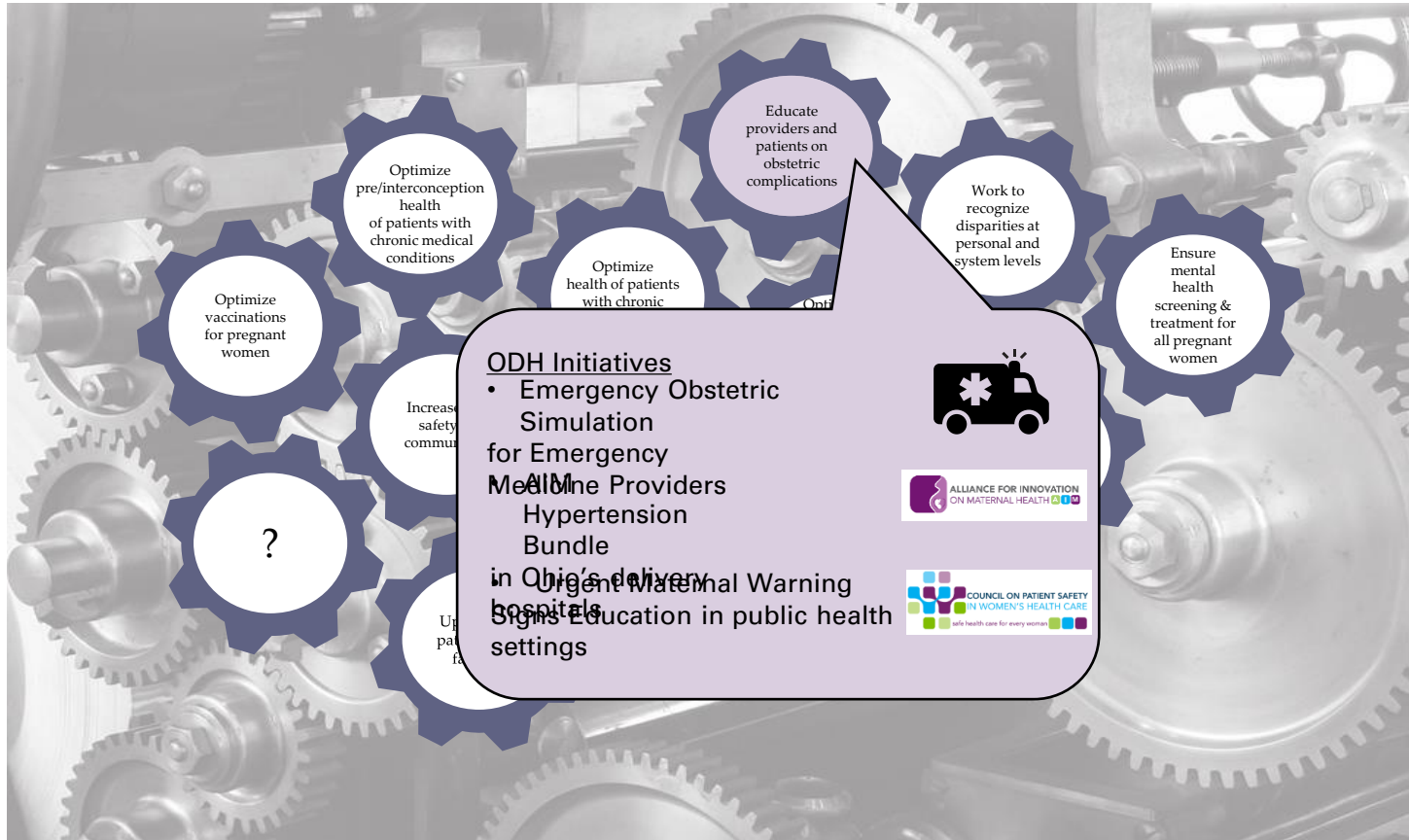
PAMR Recommendation Areas



PAMR Recommendation Areas



PAMR Recommendation Areas



Ohio is now an AIM state!!!!



- <https://www.cmqcc.org/resources-tool-kits/toolkits>
- Toolkit release date: January 23, 2020

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**It's not how *I* could have prevented a death;
it's how *patients, providers, facilities, system
and community* can work together to prevent
deaths.**

Slide courtesy of Julie Zaharatos, CDC

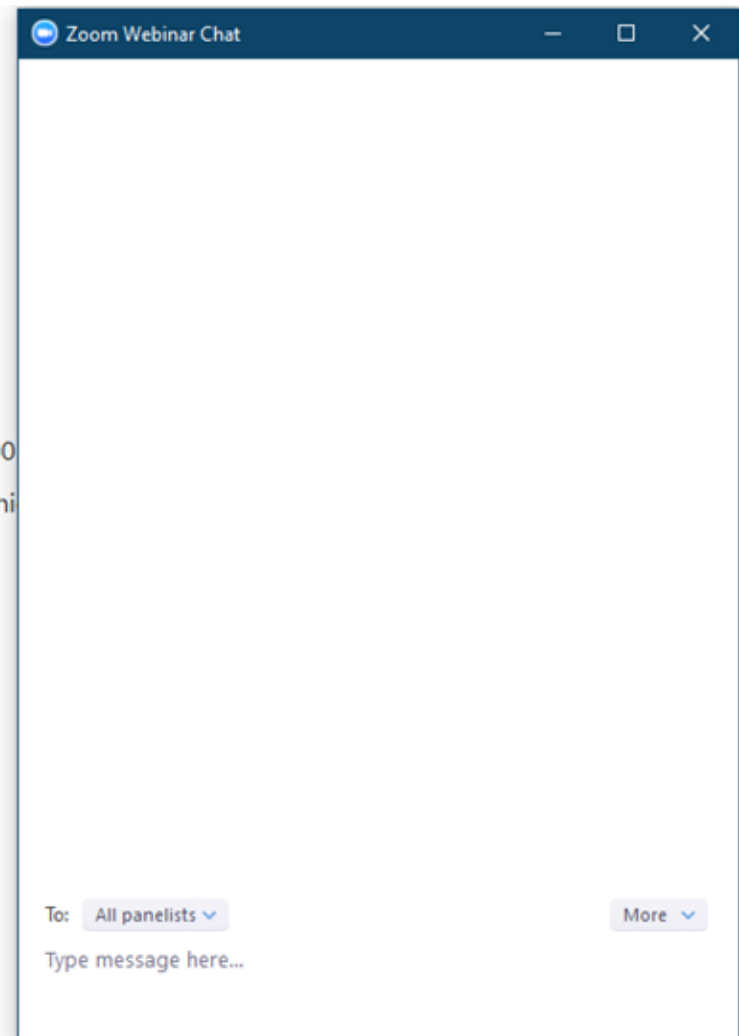
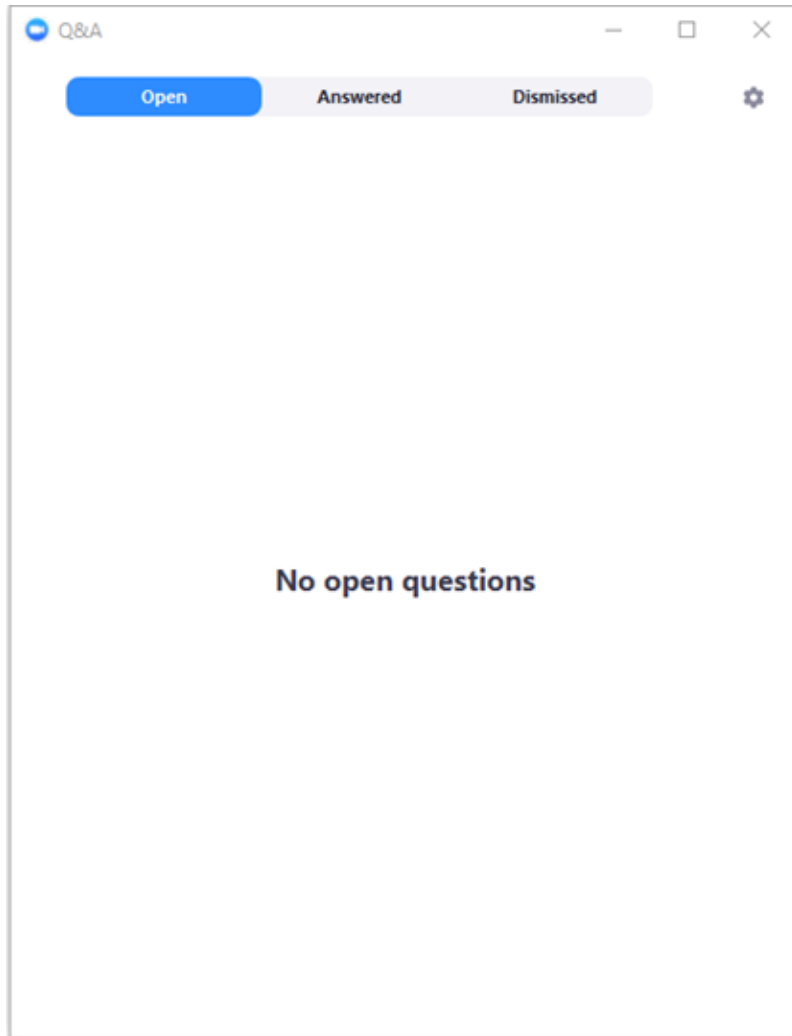
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Questions?

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SUBMITTING QUESTIONS



OHA collaborates with member hospitals and health systems to ensure a healthy Ohio

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