

PUBLIC HEALTH OF MOTHERS & CHILDREN COURSE TOPIC

# Preeclampsia

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# Content Synopsis

## OVERVIEW OF PRESENTATION

Definition & Problem Description

Epidemiology

Justification for Taking Action

Examination of Determinants (SEM)

Problem Analysis

Interventions & Logic Models

Recommendations



# Definition

## PREECLAMPSIA (PE)

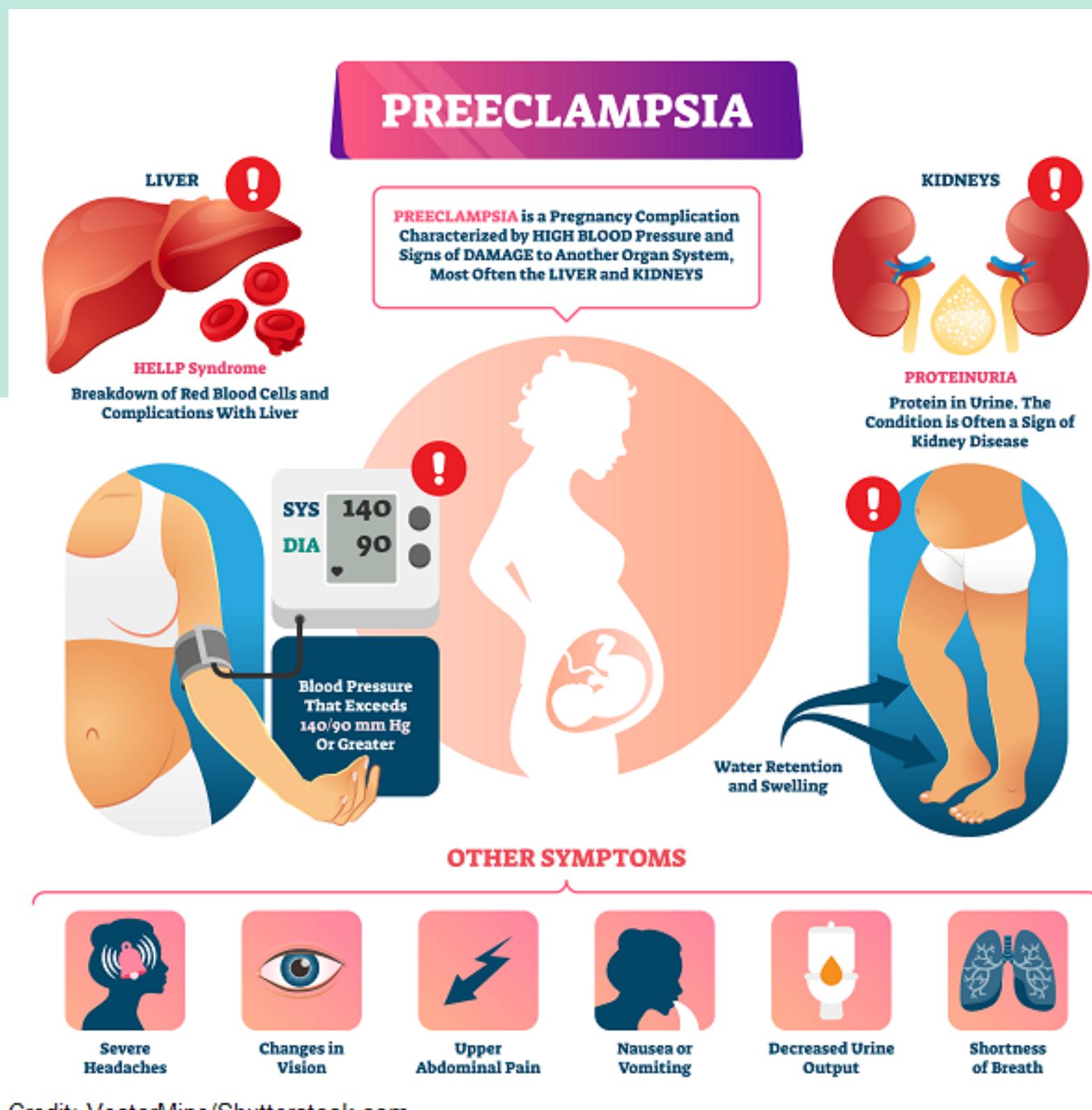
### Overview

- Hypertensive pregnancy condition
- Affects both mother & fetus
- Develops after 20th week or soon after delivery (rare)
- Blood pressure 140/90 mm/Hg or higher and associated with the onset of:
  - protein in the urine (proteinuria)
  - low platelet count (thrombocytopenia)
  - impaired liver function

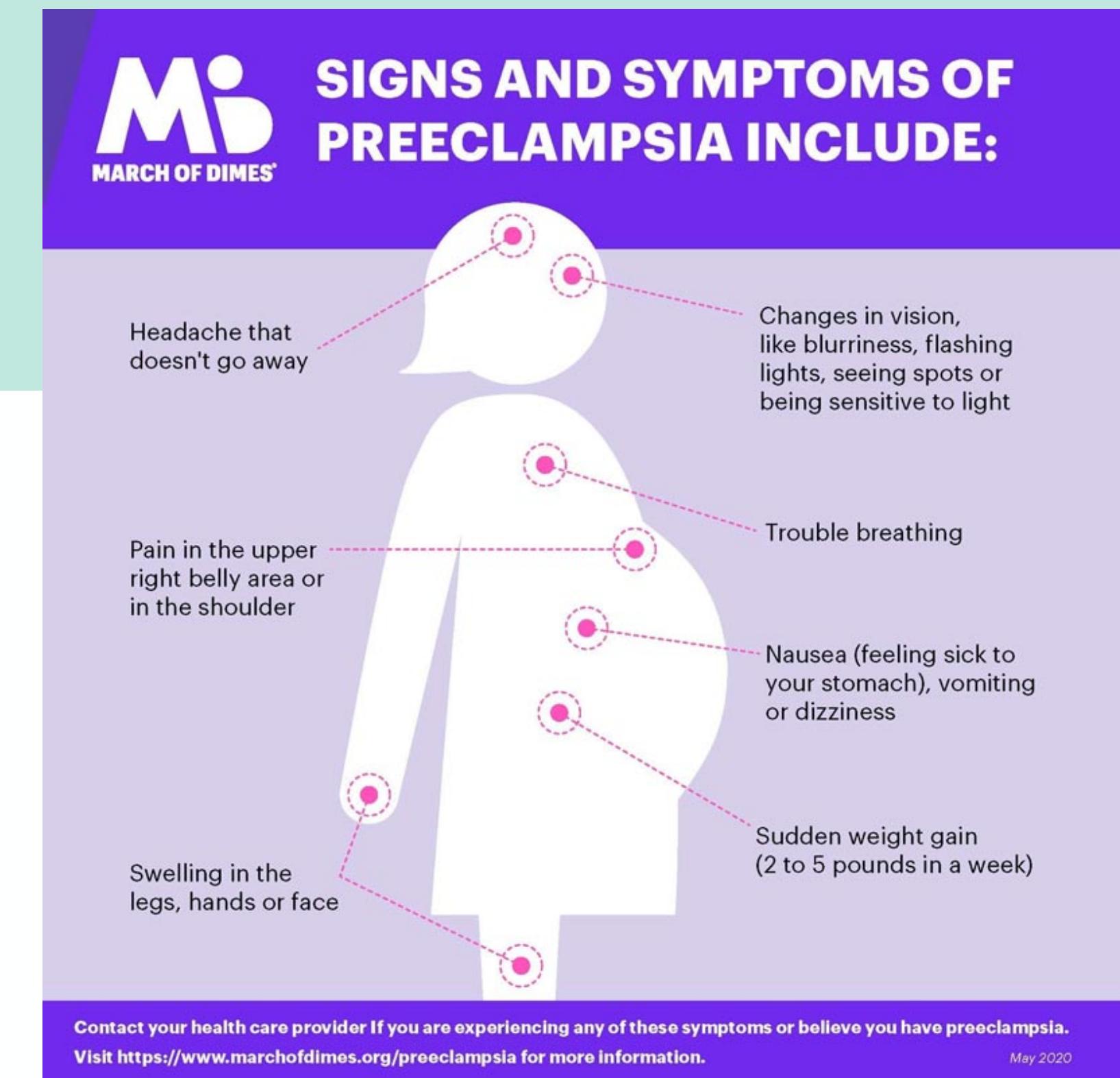
### Symptoms

- Unexplained severe and persistent epigastric pain (unresponsive to treatment)
- Renal insufficiency
- Pulmonary edema
- Unexplained new-onset of cerebral symptoms (unresponsive to treatment)
- Visual changes





Credit: VectorMine/Shutterstock.com



# Problem Description

## Health Outcomes



## HEALTH OUTCOMES

If left unmanaged, PE can bring about adverse short- and long-term maternal, fetal, and infant outcomes.



### MATERNAL

- Placental abruption
- Higher risk of cesarean delivery
- Chronic hypertension
- Pre-term birth
- Cerebrovascular disease
- Eclampsia
- Death



### FETAL & INFANT

- Intrauterine growth restriction
- Hypoxia
- Low Apgar score
- Low birth weight
- Nutritional deficiencies
- Stillbirth
- Neonatal death

# Problem Description

## Causes & Risk Factors



## RISK FACTORS

- Cause is **unknown**.
- Nulliparity
- Multiple gestations
- Very young or advanced maternal age
- Use of assisted reproductive technologies
- $\text{BMI} \geq 30$
- African American race
- History of hypertension/preeclampsia in previous pregnancy
- Having chronic hypertension, chronic kidney disease, or diabetes before pregnancy

## PREVENTION, TREATMENT & MANAGEMENT



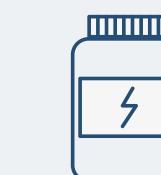
Calcium supplementation



Magnesium sulfate therapies



Management of dietary salt intake



Antihypertensive medication



Regular prenatal visits

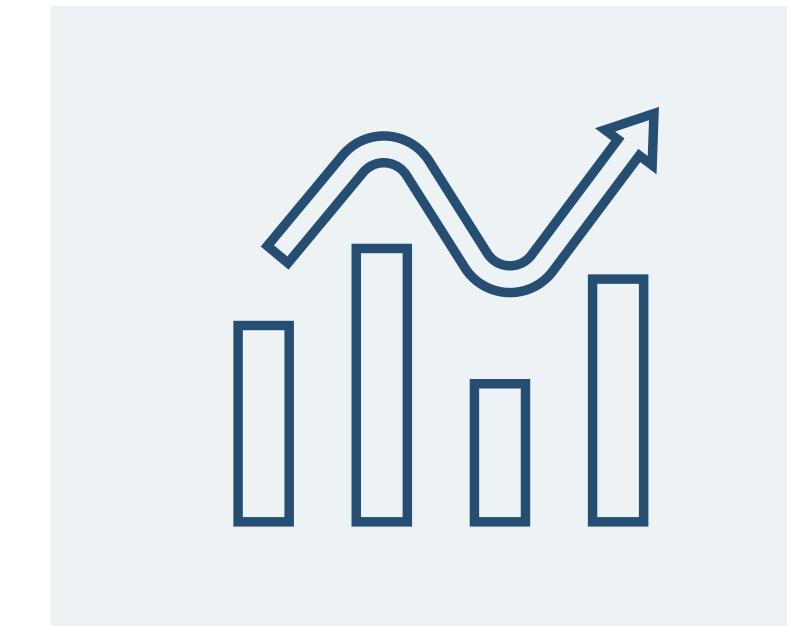


Removal of placental, or delivery, is the only effective cure

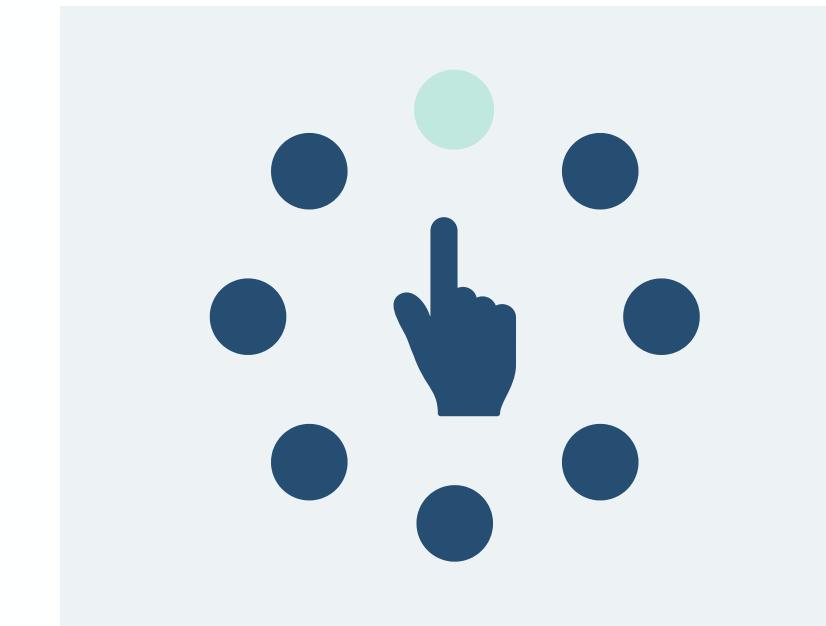
# Epidemiology of PE



Extent of Preeclampsia



Trends & Duration



Variation of Selected Risk Factors



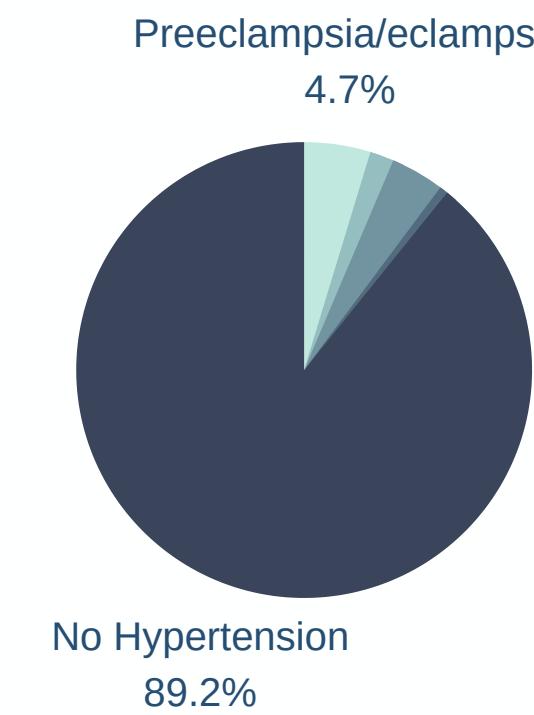
1 in 25

Pregnancies in the US are affected by PE

#### TOP 6 LEADING CAUSES

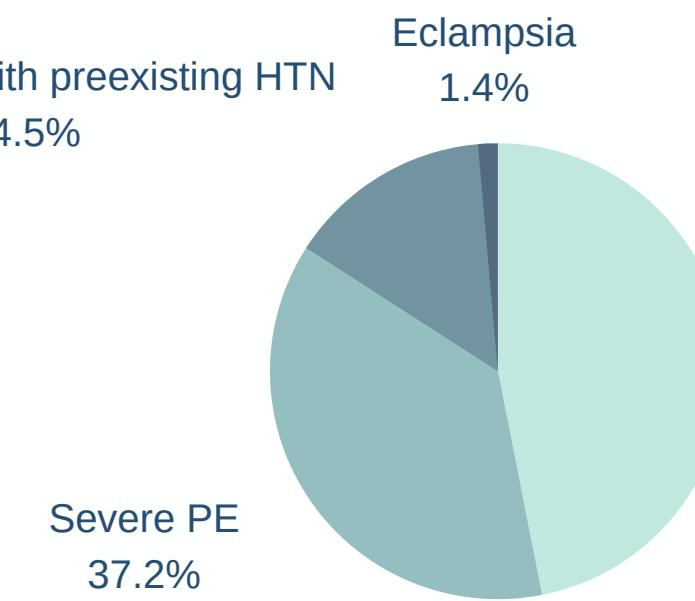
Preeclampsia is among the top six leading causes of maternal and fetal morbidity and mortality in the US.

# 2014 Delivery Hospitalizations in the US



Delivery Hospitalizations

PE/eclampsia with preexisting HTN  
14.5%



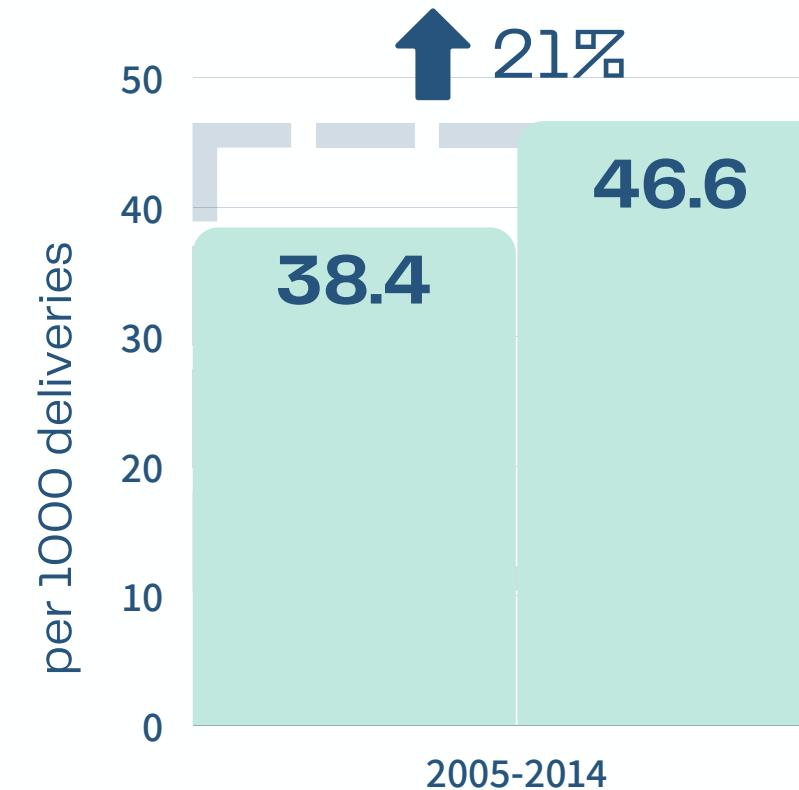
Deliveries with Preeclampsia/Eclampsia

# Duration & Trends

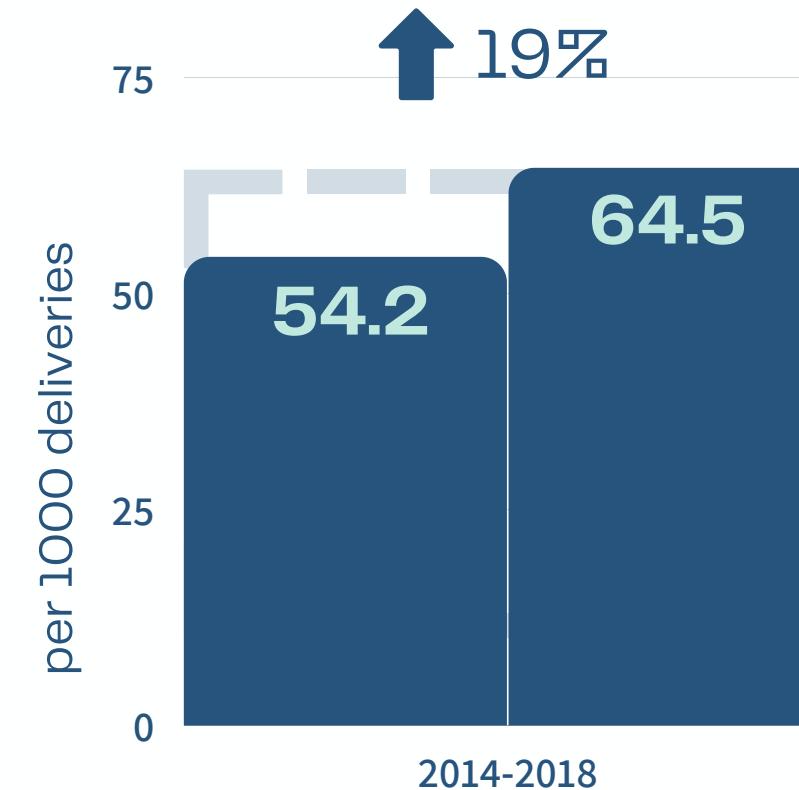


## TRENDS BETWEEN 2005-2014 & 2014-2018

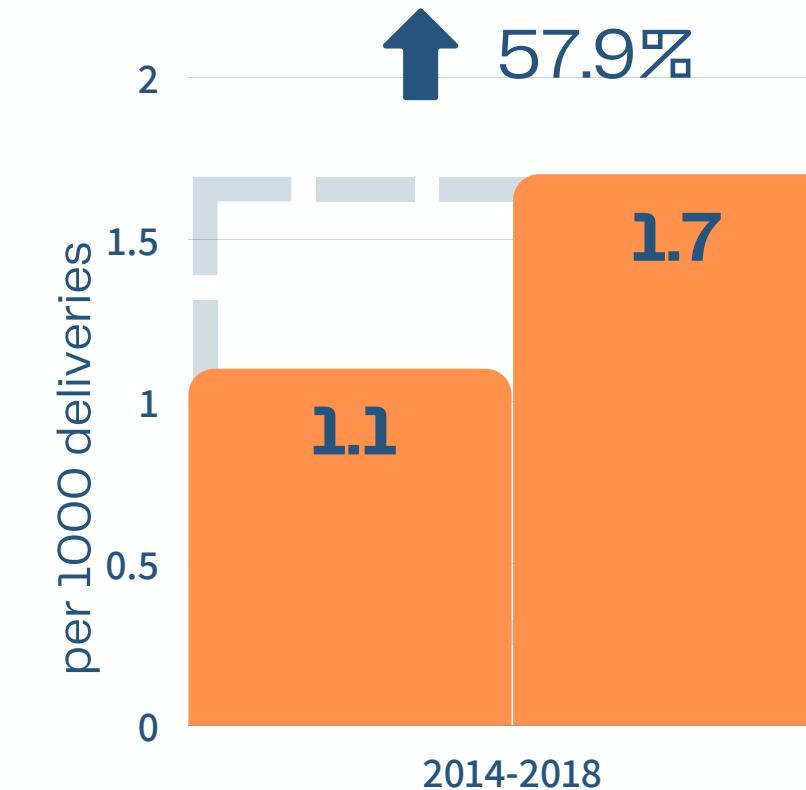
### 2005-2014 US Preeclampsia Rates



### 2014-2018 US PE Pregnancy Complications (18-44 years of age)



### 2014-2018 US Eclampsia Childbirth Complications



## MATERNAL AGE

- **Very young (< 20 years)**
  - (2014) 59.3 per 1000
  - Higher than other age groups by 6.8 to 13.1 per 1000
- **Advanced ( $\geq 40$  years)**
  - (2014) 73.5 per 1000
  - 1.6% to 2.3% than other age groups



## MATERNAL RACE & ETHNICITY

- **50% higher rates** among African American and Black women (69.8 per 1000 delivers)
  - Also more likely to receive a severe diagnosis
- **Similar rates** among Hispanic and non-Hispanic whites
  - 46.8 and 43.3 per 1000 deliveries, respectively
- **Lowest rates of PE/eclampsia** among AAPI women
  - 28.8 per 1000 deliveries



# Justification for Taking Action



## Steadily Increasing PE Rates

Between 2007-2017, rates increased from 14.6 to 17.3 per 100,000 live births.



## Discover More Effective Treatment & Management Options

Placental removal, or delivery, is the only known effective cure for PE.



## Reduce Pre-term Births

PE has been found to lower gestational age by 1.7 weeks and contributes to infant morbidity



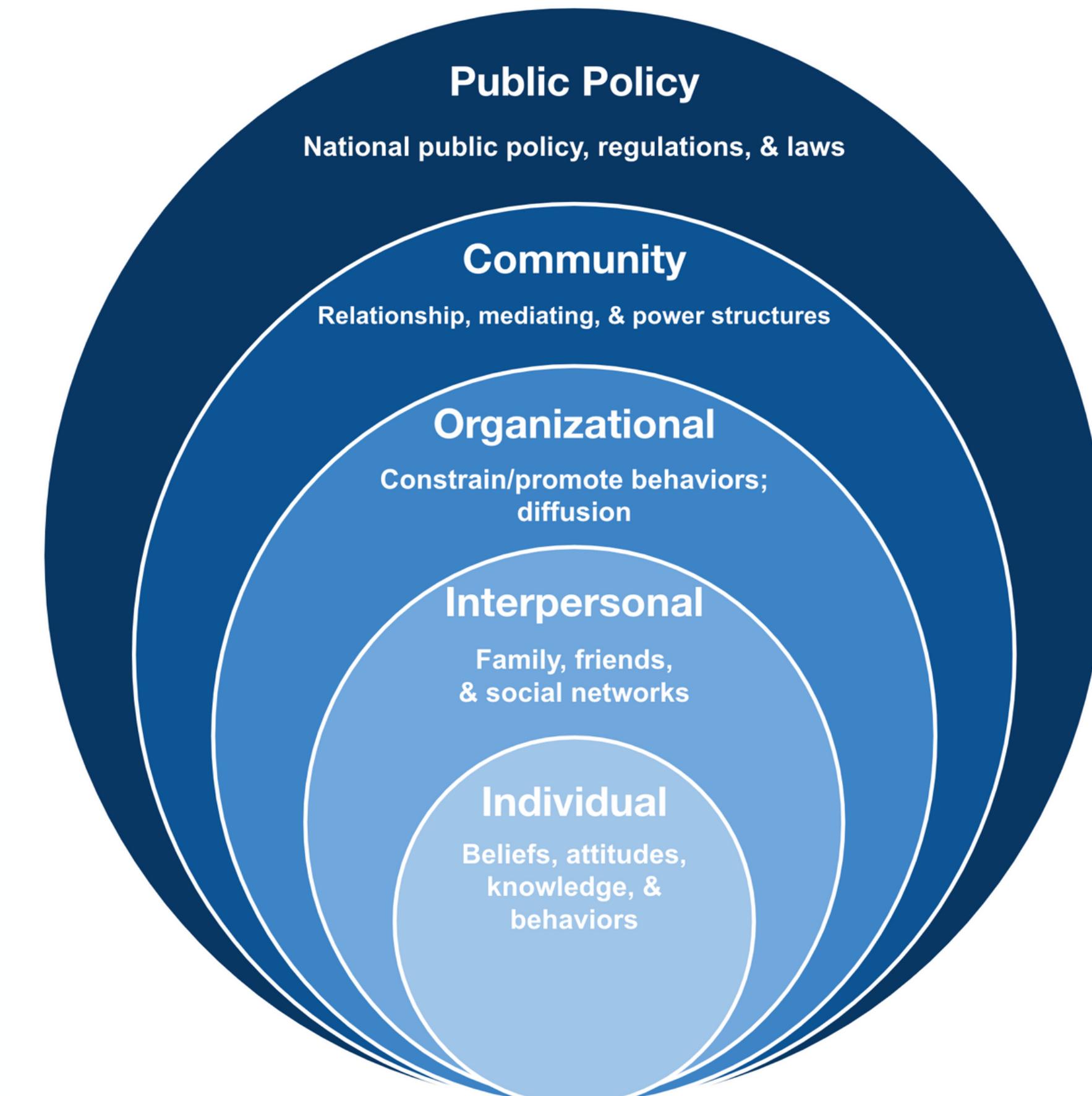
## Morbidity & Mortality

Various adverse short- and long-term health outcomes are associated with PE for both mother and baby.

# Examination of Determinants with McLeroy's SEM



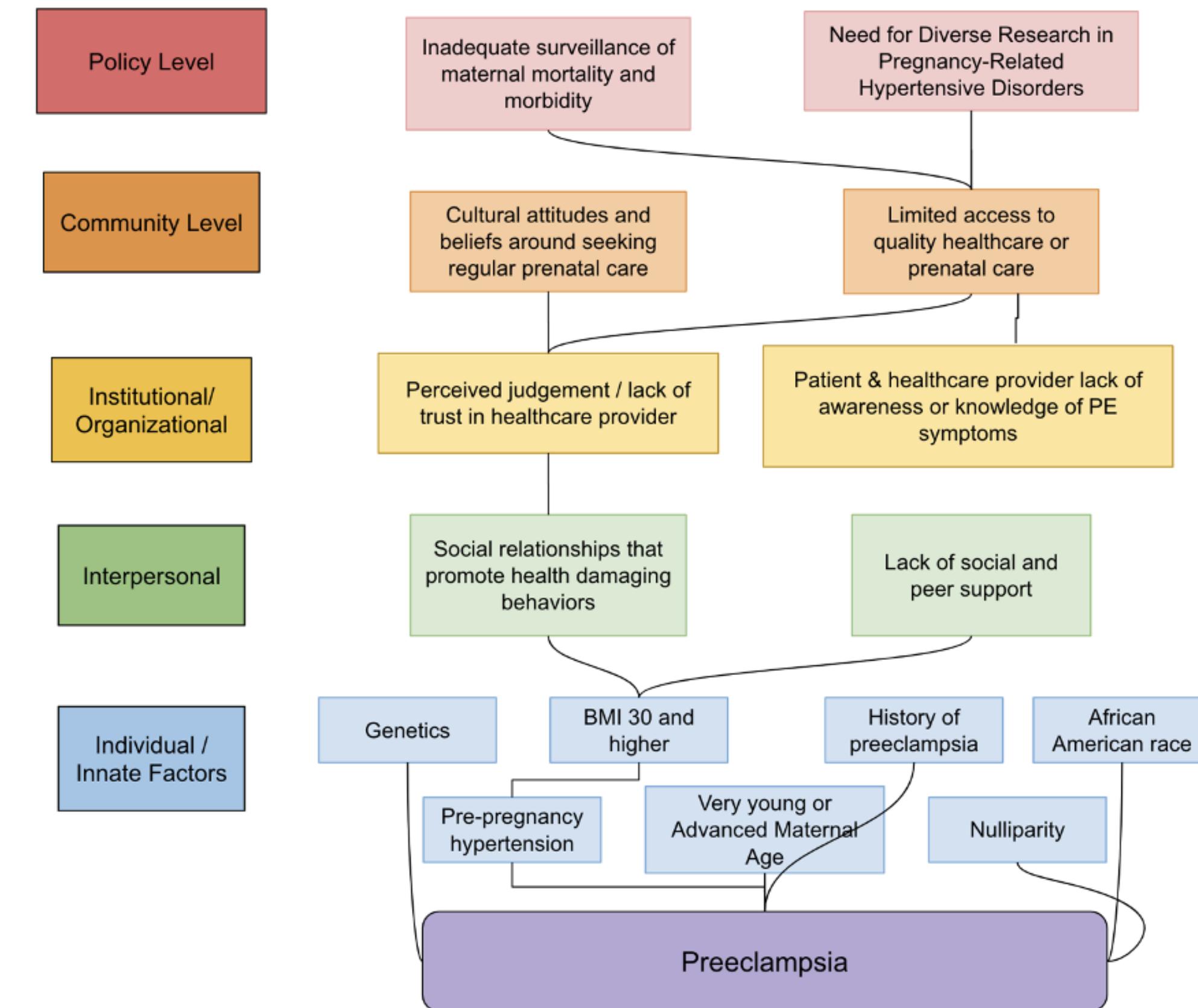
## McLeroy's Social Ecological Model



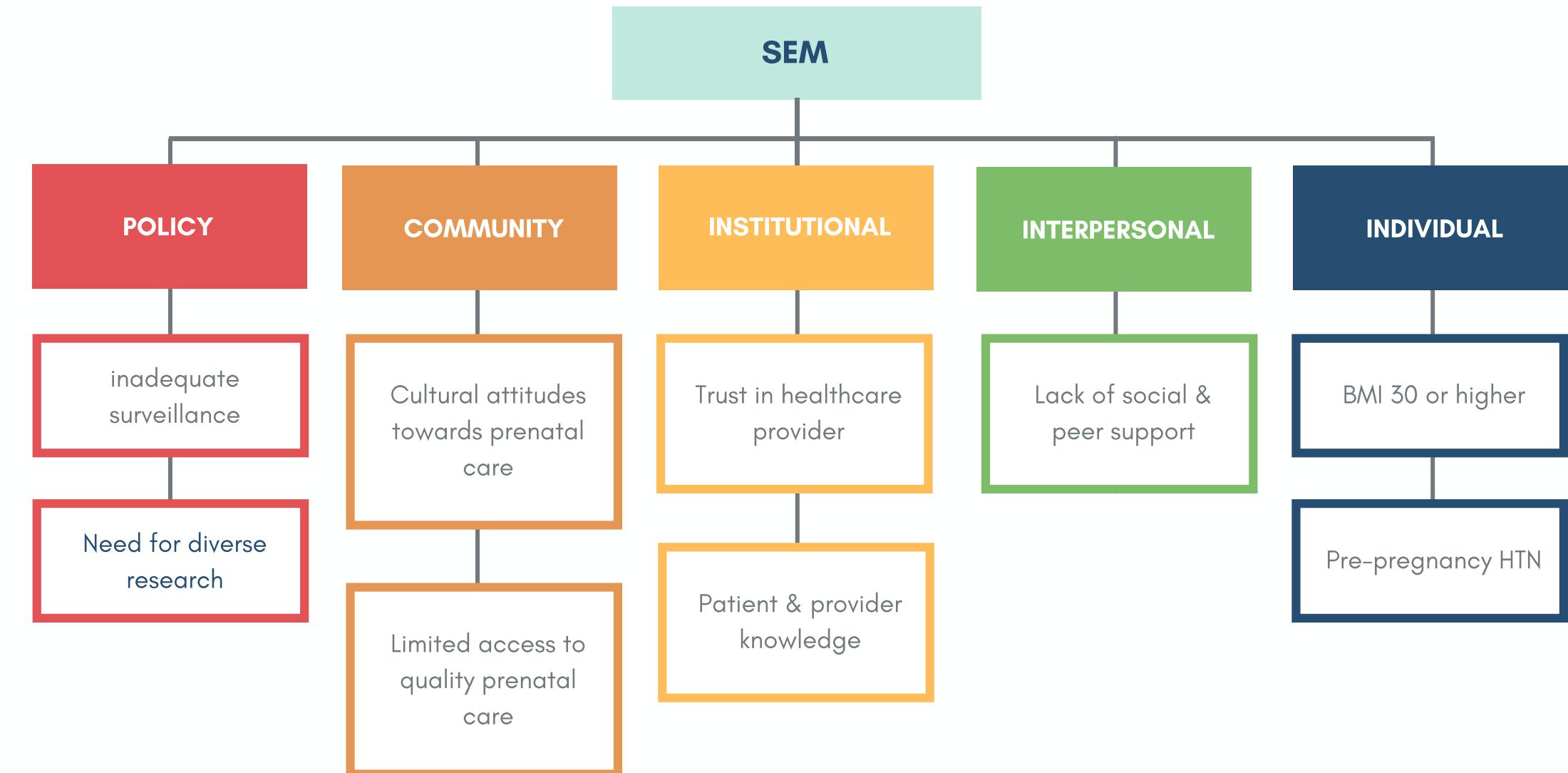
# Problem Analysis



## Problem Analysis Diagram



# Factors Amenable to Intervention



# Interventions

01

## Maternal Mortality Prevention Program (MMPP)

- Policy
- Colorado
- Eliminate preventable maternal deaths
- Community-led solutions, clinical quality improvement, & public health programs

02

## Healthy Babies Are Worth the Wait (HBWW)

- Community; Organizational; Individual
- Kentucky
- Decrease pre-term birth rates by increasing community awareness and changing attitudes and behaviors among providers and patients.

03

## Cuff Kit Program

- Organizational, Individual
- Nationwide
- Ensure timely diagnosis & treatment of pregnancy-related hypertension
- Self-efficacy to monitor blood pressure and increase patient engagement

04

## MoMMA's Voices Champions Training Center

- Interpersonal; Policy; Community
- National
- Maternal Mortality and Morbidity Advocates
- Virtual platform, community building, patient-provider advocacy

05

## Prenatal Plus Program

- Individual level
- Colorado, pregnant women on Medicaid
- Enable patient to engage in a healthy lifestyle and access medical and social resources



01

## Maternal Mortality Prevention Program (MMPP)

- Policy
- Colorado
- Eliminate preventable maternal deaths
- Community-led solutions, clinical quality improvement, & public health programs

### MATERNAL MORTALITY PREVENTION PROGRAM - LOGIC MODEL

Process			Outcomes		
Inputs	Activities	Participants	Short-Term	Intermediate	Long-Term
<ul style="list-style-type: none"><li>• Funding from CDC and state of Colorado</li><li>• Maternal Health Manager</li><li>• Maternal Health Clinical Consultant</li><li>• Secondary Case Abstractor</li><li>• Maternal Mortality Data Analyst</li><li>• Perinatal Behavioral Specialist</li><li>• Program Assistant</li><li>• Special Projects Coordinator</li><li>• Maternal and infant Wellness Section Manager</li></ul>	<p>Establishment of the Colorado Maternal Mortality Review Committee</p> <p>Build partnerships and learn from communities experiencing high maternal mortality</p> <p>Improve maternal patient safety</p> <p>Development of community-led solutions</p> <p>Adhere to Colorado's Mortality Prevention Program Framework</p>	<ul style="list-style-type: none"><li>• Maternal Mortality Review Committee</li><li>• Maternal and Child health Community Advisory Board</li><li>• Community-based perinatal and birth providers</li><li>• State-level Title V maternal and child health partners and community partners</li></ul>	<p>Timely review of each maternal death, regardless of cause, in the state of Colorado</p> <p>Improvement of maternal mortality review process</p>	<p>Implementation of recommendations for clinical quality improvement</p> <p>Identification of specific social determinants of health in communities</p>	<ul style="list-style-type: none"><li>• Reduction of maternal mortality</li><li>• Improved maternal health and well-being</li><li>• Reduction in various disparities</li></ul>

02

## Healthy Babies Are Worth the Wait (HBWW)

- Community; Organizational; Individual
- Kentucky
- Decrease pre-term birth rates by increasing community awareness and changing attitudes and behaviors among providers and patients.

### HEALTHY BABIES ARE WORTH THE WAIT - LOGIC MODEL

Process →			Outcomes		
Inputs	Activities	Participants	Short-Term	Intermediate	Long-Term
Steering Committee Advisory Board Executive Leadership Team Ad-Hoc Workshops Program Site Implementation Team Electronic Communication Website Shared Virtual Workspace Evidence-based practice guidelines	Prenatal care clinical services Referral and social support services Home-visitation services (Nurse-Family Partnership) Cultural competence training <b>Media Campaign.</b> Development and dissemination of educational materials about preterm birth and associated risk factors	<ul style="list-style-type: none"> <li>• Women of childbearing age living in Kentucky</li> <li>• Family members and friends affected by the event of preterm birth</li> </ul> <p><b>Partners</b></p> <ul style="list-style-type: none"> <li>• Kentucky Department for Public Health</li> <li>• March of Dimes</li> <li>• Johnson &amp; Johnson</li> </ul>	<ul style="list-style-type: none"> <li>• Improves knowledge and perceived behavioral control around preterm birth among pregnant women</li> <li>• Improves knowledge and changes attitudes in the community around family planning and prevention of preterm birth</li> <li>• Improves provider knowledge of referral services</li> </ul>	<ul style="list-style-type: none"> <li>• Adoption of behaviors among pregnant women and community members that prevent pre-term births</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce preterm birth</li> <li>• Reduce neonatal morbidity</li> </ul>



03

## Cuff Kit Program

Give Cuff Kits to

**moms in need**

- Organizational, Individual
- Nationwide
- Ensure timely diagnosis & treatment of pregnancy-related hypertension
- Self-efficacy to monitor blood pressure and increase patient engagement

## CUFF KIT PROGRAM LOGIC MODEL

Process		Outcomes			
Inputs	Activities	Participants	Short-Term	Intermediate	Long-Term
<p><b>Cuff Kit</b></p> <ul style="list-style-type: none"> <li>• Validated automatic blood pressure measuring device</li> <li>• Patient education materials available in print, video, &amp; web</li> <li>• Blood pressure tracking logs</li> <li>• "Still at risk" bracelet</li> <li>• Staff education materials</li> </ul> <p><b>Staff &amp; Other Materials</b></p> <ul style="list-style-type: none"> <li>• Statistician / Data Analyst</li> <li>• Project manager</li> <li>• Healthcare providers / Nurse educator</li> <li>• Accounts payable department</li> <li>• Tracking/distribution system for Cuff Kits</li> <li>• Cuff Kit Connection online platform</li> </ul>	<ol style="list-style-type: none"> <li>1. Practice or provider determines need for Cuff Kits, completes order form, and distributes kits to high-risk pregnant women.</li> <li>2. Provide instructions and trainings to providers on how to demonstrate use of cuff kits to patient.</li> <li>3. Patients receives demonstration and educational materials on how to use Cuff Kit.</li> <li>4. Establish an advisory committee that is reflective of East Gainesville residents and stakeholders.</li> <li>5. Optional monthly online discussions via Cuff Kit connection</li> </ol>	<p><b>Participating Providers</b></p> <ul style="list-style-type: none"> <li>• OB/GYNs</li> <li>• Hospitals and clinics</li> <li>• Community health centers</li> <li>• Federally Qualified Health Centers</li> <li>• Public health clinics</li> <li>• Nurse home-visiting programs</li> </ul> <p><b>Patients</b></p> <ul style="list-style-type: none"> <li>• Pregnant women with identifiable risk factors for developing preeclampsia</li> </ul>	<ul style="list-style-type: none"> <li>• Rapidly uses Telehealth for pregnant women who are either high-risk or at-risk for preeclampsia.</li> <li>• Provides tools and educational materials for patients to monitor blood pressure at home.</li> <li>• Engages both patient and provider in education about preeclampsia</li> </ul>	<ul style="list-style-type: none"> <li>• Improves patient-provider communication and relationship</li> <li>• Improves patient knowledge and self-efficacy of monitoring blood pressure</li> <li>• Utilization of data to inform treatment and improve program</li> </ul>	<ul style="list-style-type: none"> <li>• Increased patient engagement in managing healthcare</li> <li>• Increased uptake of BP monitoring will allow for timely diagnosis and treatment of preeclampsia</li> <li>• Reducing disparities in maternal and fe</li> </ul>



- Interpersonal; Policy; Community
- National
- Maternal Mortality and Morbidity Advocates
- Virtual platform, community building, patient-provider advocacy

## MoMMA's VOICES CHAMPIONS TRAINING CENTER - LOGIC MODEL

Process		Outcomes			
Inputs	Activities	Participants	Short-Term	Intermediate	Long-Term
<p><b>Training and Support</b></p> <ul style="list-style-type: none"> <li>• Facebook community group</li> <li>• Third-party online platform</li> <li>• Training modules available online via Word, PowerPoint, and video formats.</li> <li>• Community partnerships</li> </ul> <p><b>Staff</b></p> <ul style="list-style-type: none"> <li>• Coalition manager</li> <li>• Project manager</li> <li>• Graphic designer &amp; Video editor</li> <li>• Content contributors</li> </ul>	<p>Patient Family Partners (PFPs) undergo 4 training modules</p> <p>Provision of supplementary training modules</p> <p>Outreach to potential PFP stakeholders and patient advocacy organizations</p>	<p><b>Patient Family Partners (PFPs)</b></p> <ul style="list-style-type: none"> <li>• Volunteers</li> <li>• Providers</li> <li>• Family members</li> <li>• Friends</li> <li>• Community members</li> </ul> <p><b>Patient Advocacy Organizations</b></p> <ul style="list-style-type: none"> <li>• Preeclampsia Foundation</li> <li>• 2020 Mom</li> <li>• Every Mother Counts</li> <li>• Black Women's Health Imperative</li> <li>• Shades of Blue Project</li> <li>• National Accreta Foundation</li> <li>• AFE Foundation</li> </ul>	<ul style="list-style-type: none"> <li>• Promotes patient advocacy engagement in a virtual setting</li> <li>• Promotes PFP self-efficacy in patient advocacy for improved maternity care</li> <li>• Provides a space for healing and community belonging</li> <li>• Certification of completion</li> </ul>	<ul style="list-style-type: none"> <li>• Improves understanding and emotional awareness of one's experience.</li> <li>• Ability for PFPs to share their experience to effect change</li> </ul>	<ul style="list-style-type: none"> <li>• Impact and change how providers deliver maternity care and treatment</li> <li>• Better communication and relationship between provider and patients receiving maternity care</li> <li>• Reducing maternal morbidity and mortality</li> </ul>

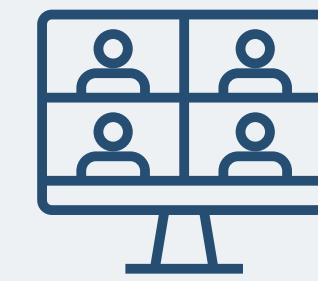
## PRENATAL PLUS PROGRAM - LOGIC MODEL

Process			→	Outcomes		
Inputs	Activities	Participants	Short-Term	Intermediate	Long-Term	
<p>Funding from the Maternal and Child Health Block Grant</p> <p>Colorado Department of Health</p> <p>Structure for Medicaid reimbursement</p> <p>Prenatal Plus intake form</p> <p>Development and distribution of provider outreach materials</p>	<p>Use of client-centered counseling approaches to interact with patients</p>	<p>Medicaid eligible pregnant women in Colorado meeting at least 1 of 5 criteria of primary risk factors or 3 of 18 criteria of secondary risk factors</p> <p>Prenatal healthcare providers</p> <p>County health departments</p> <p>County nursing services</p> <p>Community health centers</p> <p>Non-profit agencies</p>	<ul style="list-style-type: none"> <li>• Improve patient knowledge and awareness about their risk for delivering low birthweight infants</li> <li>• Improved patient-provider engagement in patient healthcare management through goal-setting</li> <li>• Increased screening to assess risk of delivering a low birthweight infant</li> </ul>	<ul style="list-style-type: none"> <li>• Improved patient-provider communication and relationship</li> <li>• Improved mental and nutritional health</li> <li>• Resolution of individual or multiple risk factors</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction of individual level-risk factors</li> <li>• Reduction of low birthweight infants</li> <li>• Reducing maternal and neonatal morbidity</li> </ul>	

# Recommendations



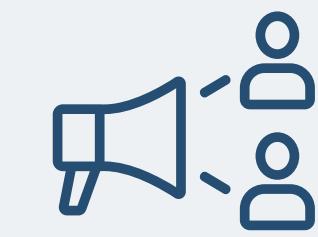
Increase use of telehealth strategies and smart-technologies for high-risk pregnancies



Establish online learning and advocacy communities for patients and providers



Offer funding for all states to establish maternal mortality review committees



Improve existing prenatal support programs and increase program referrals among providers

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Questions or  
Comments?



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