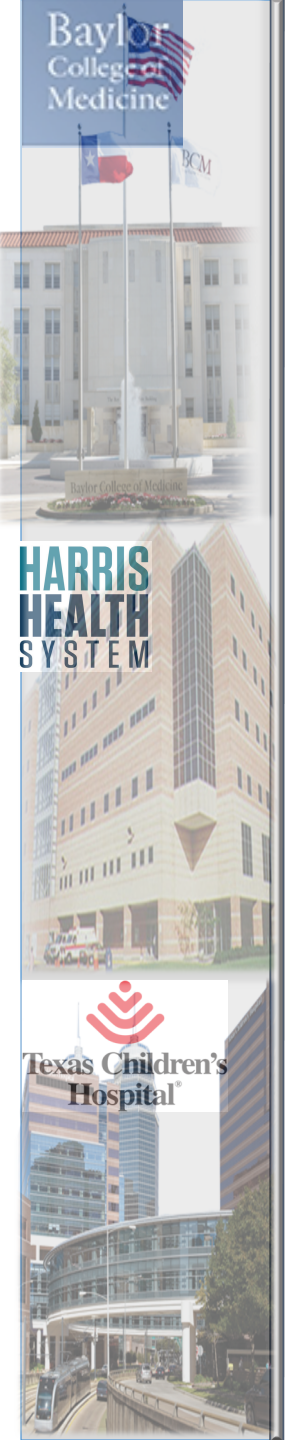

Impact of Hypertensive Disorders on Maternal Mortality and Morbidity

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Presenter Disclosure

I have no conflict of interest to disclose

I have no financial or scientific disclosures

I have no off-label disclosures

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Learning Objectives

At the completion of this session, the participants will be able to:

- Highlight the impact of hypertensive disorders on maternal morbidity and mortality in the United States and Texas
- Discuss risks of maternal hypertensive disorders on long term women's health
- Discuss identified opportunities to potentially reduce hypertension-related maternal morbidity and mortality

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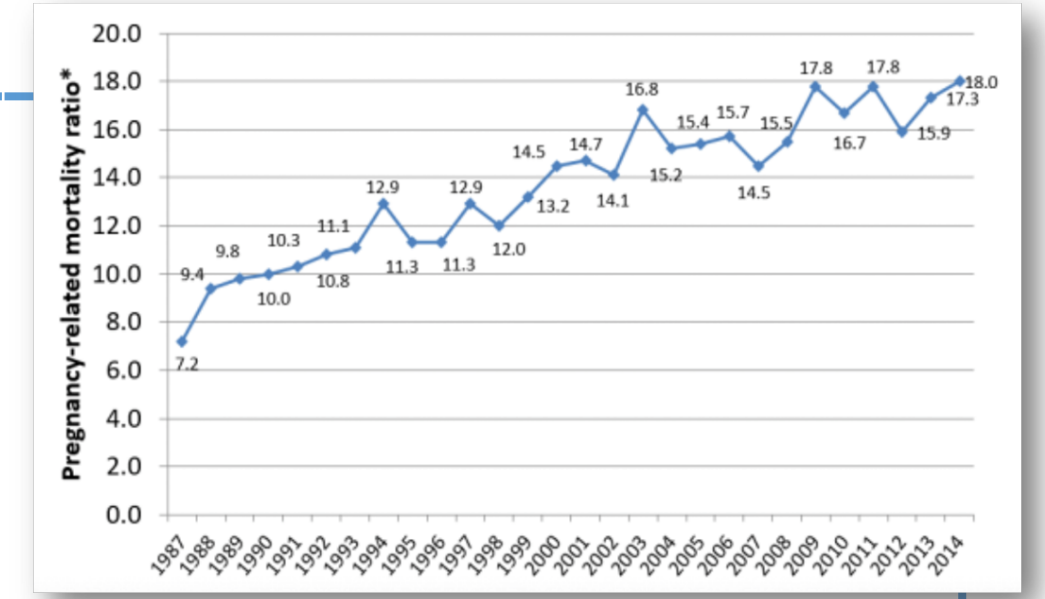
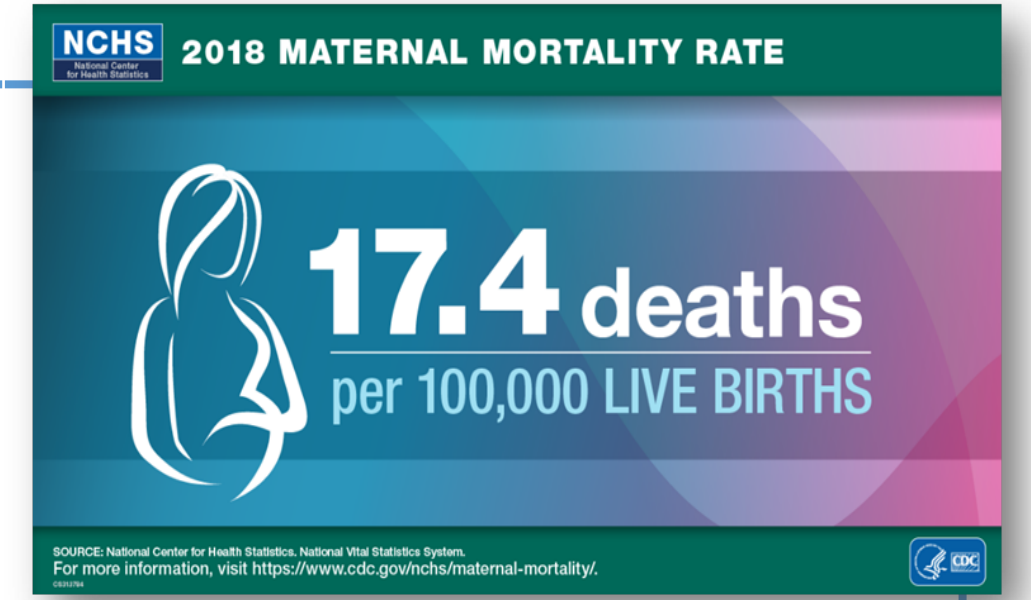
Definitions of Maternal Death

- CDC / ACOG
  - pregnancy-related death is defined as the death of a woman while pregnant or within 1 year of pregnancy termination–regardless of the duration or site of the pregnancy–from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
- CDC / ACOG
  - Pregnancy-associated mortality is the death of any woman, from any cause, while pregnant or within 1 calendar year of termination of pregnancy, regardless of duration and the site of pregnancy.

Maternal Mortality in the US



PMSS



NCHS

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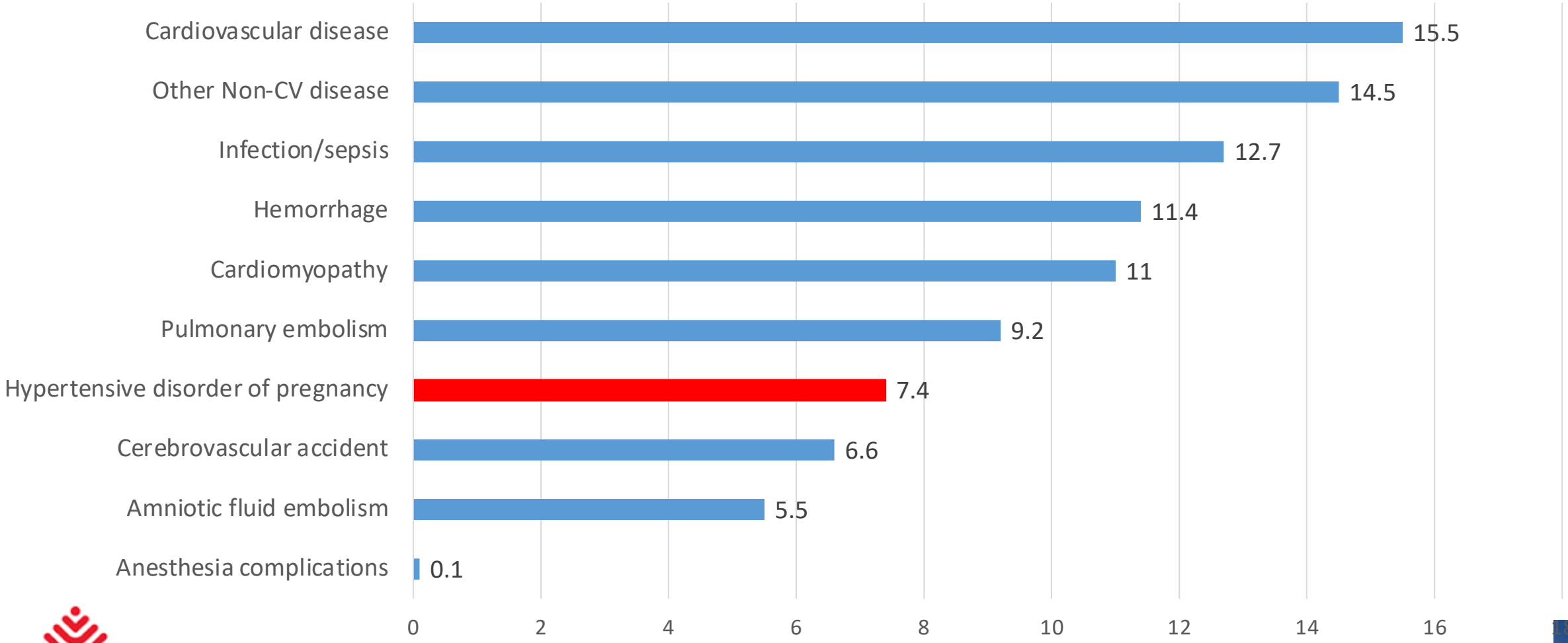
Pregnancy Mortality Surveillance System



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

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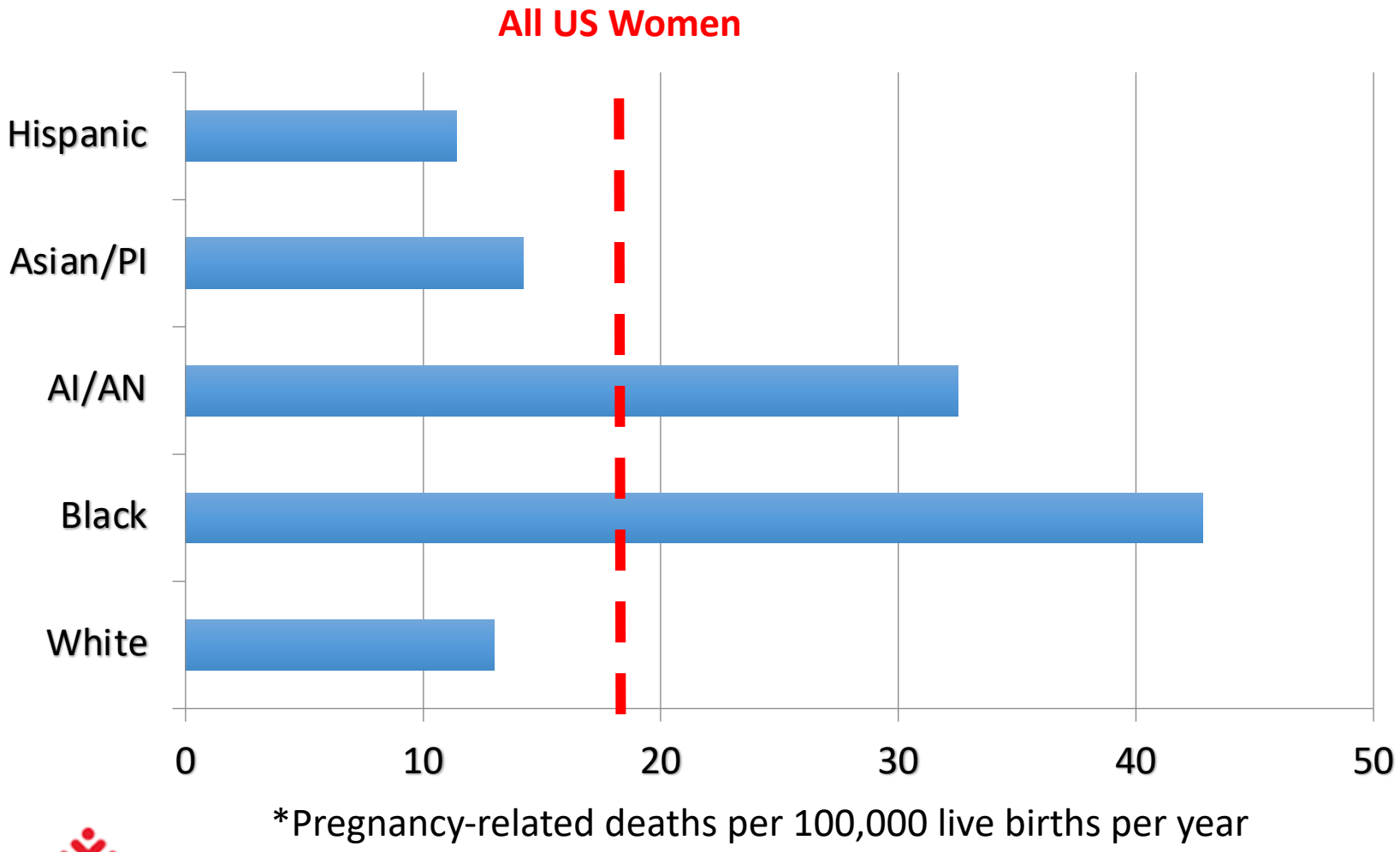
Pregnancy-Related Mortality Disparities



*Pregnancy-related deaths per 100,000 live births per year

Significant reductions in maternal mortality and morbidity can not be accomplished without addressing gaps in care for black and AI/AN women

https://www.cdc.gov/vitalsigns/index.html

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Reviewing Maternal Death

Texas MMMTF created by Senate Bill 495, 83rd legislature

- Multidisciplinary task force within the Department of State Health Services (DSHS)
- Tasked to:
  - study and review cases of pregnancy-related deaths and trends in severe maternal morbidity
  - determine the feasibility of the task force studying cases of severe maternal morbidity
  - make recommendations to help reduce the incidence of pregnancy-related deaths and severe maternal morbidity in Texas

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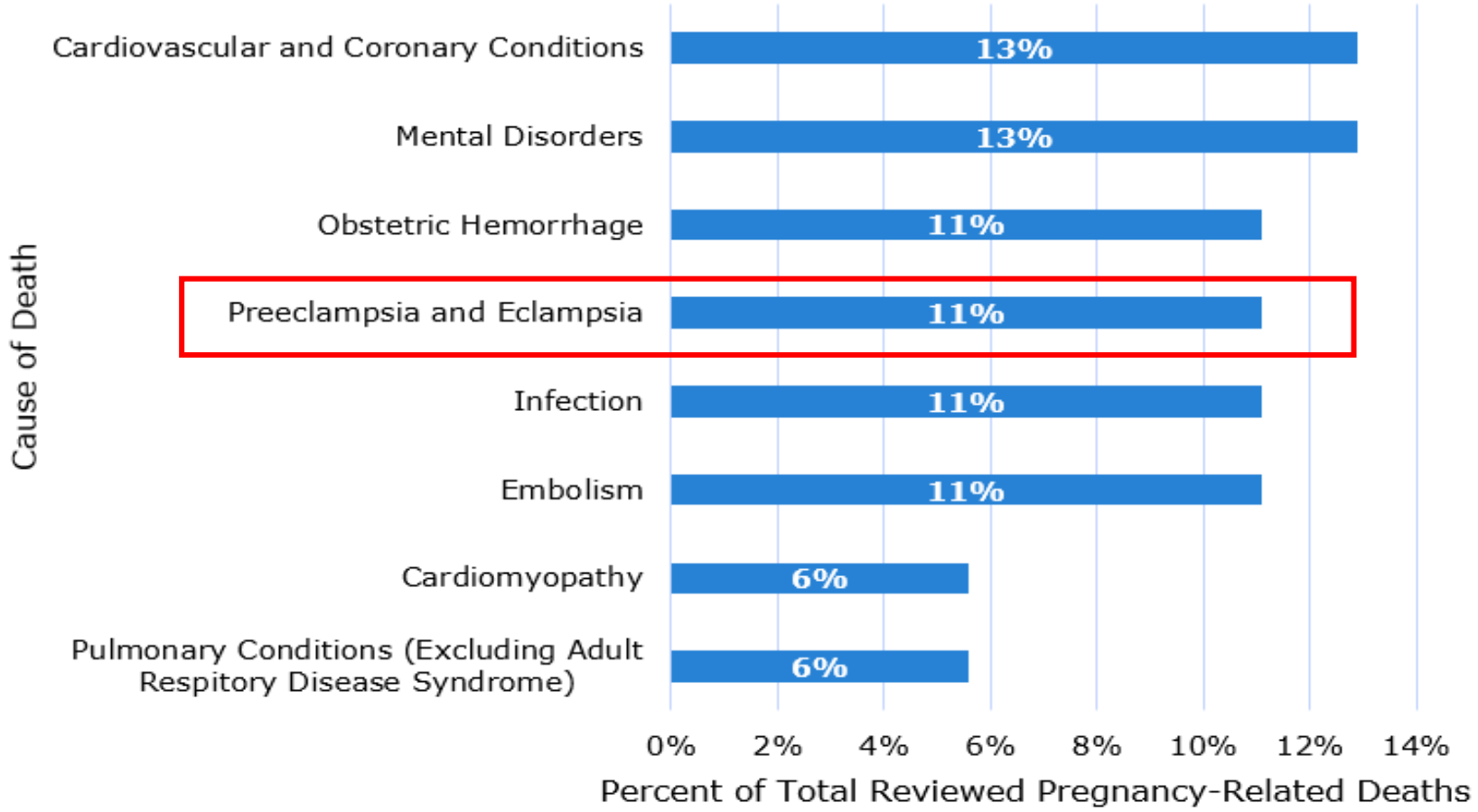
MMMTF Biennial Report 2020

https://www.dshs.texas.gov/mch/pdf/DSHS-MMMRC-2020-UPDATED-11282020.pdf

Leading Causes of Pregnancy-Related Death in Texas



Hypertensive disorders accounted for 11% of pregnancy-related deaths in 2013

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Disparity in Mortality

Disparities persist in maternal mortality. Non-Hispanic Black women are disproportionately impacted.

Race/Ethnicity	Racial/Ethnic Distribution of Reviewed Pregnancy-Related Deaths in 2013	Racial/Ethnic Distribution of Live Births in 2013
Non-Hispanic Black Women	**31%**	**11%**
Hispanic Women	26%	48%
Other Races/Ethnicities	2%	6%
Non-Hispanic White Women	41%	34%

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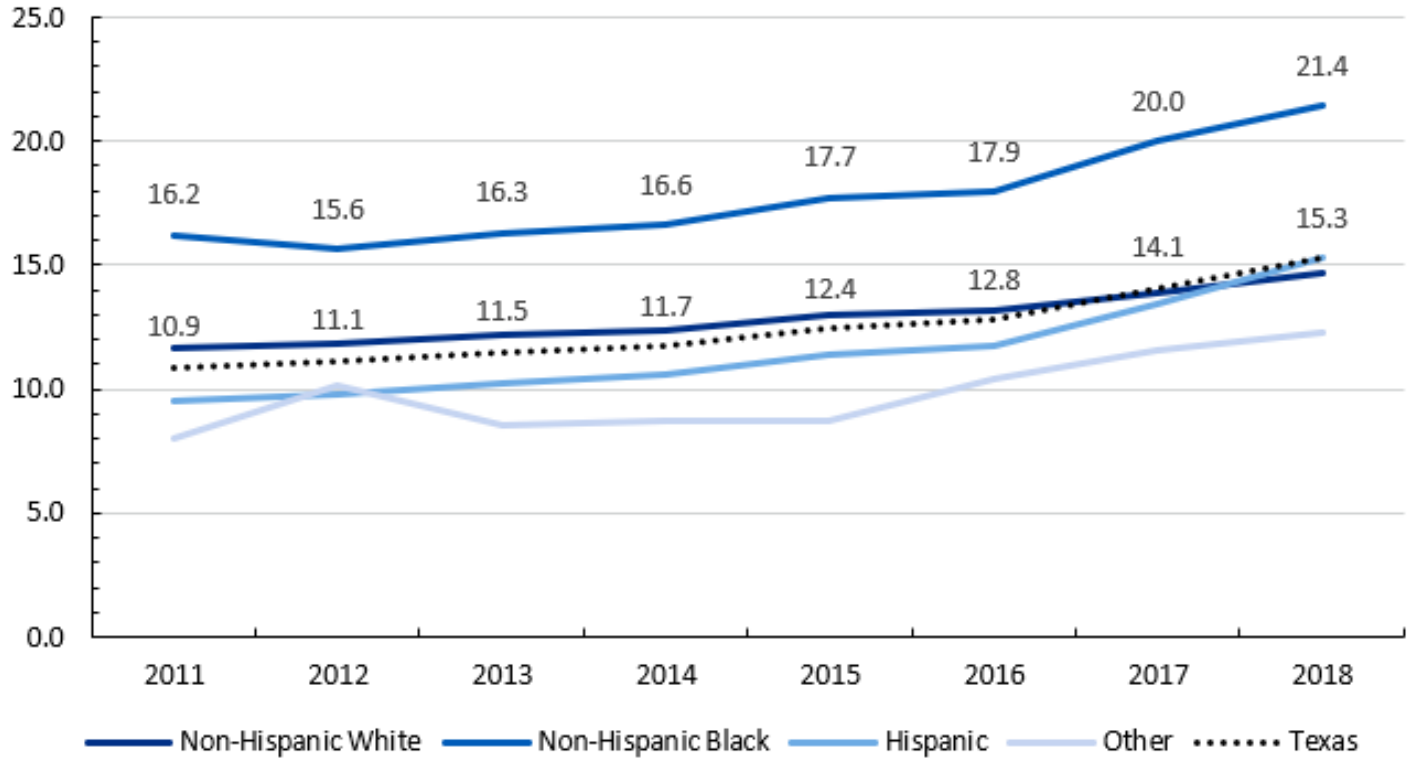
Disparity in Hypertension

Rates of delivery hospitalizations involving hypertensive disorder were highest among Non-Hispanic Black mothers and varied by county

Figure H-4: Delivery Hospitalization Involving Hypertensive Disorder Rates by Race/Ethnicity, Texas, 2011-2018[i]



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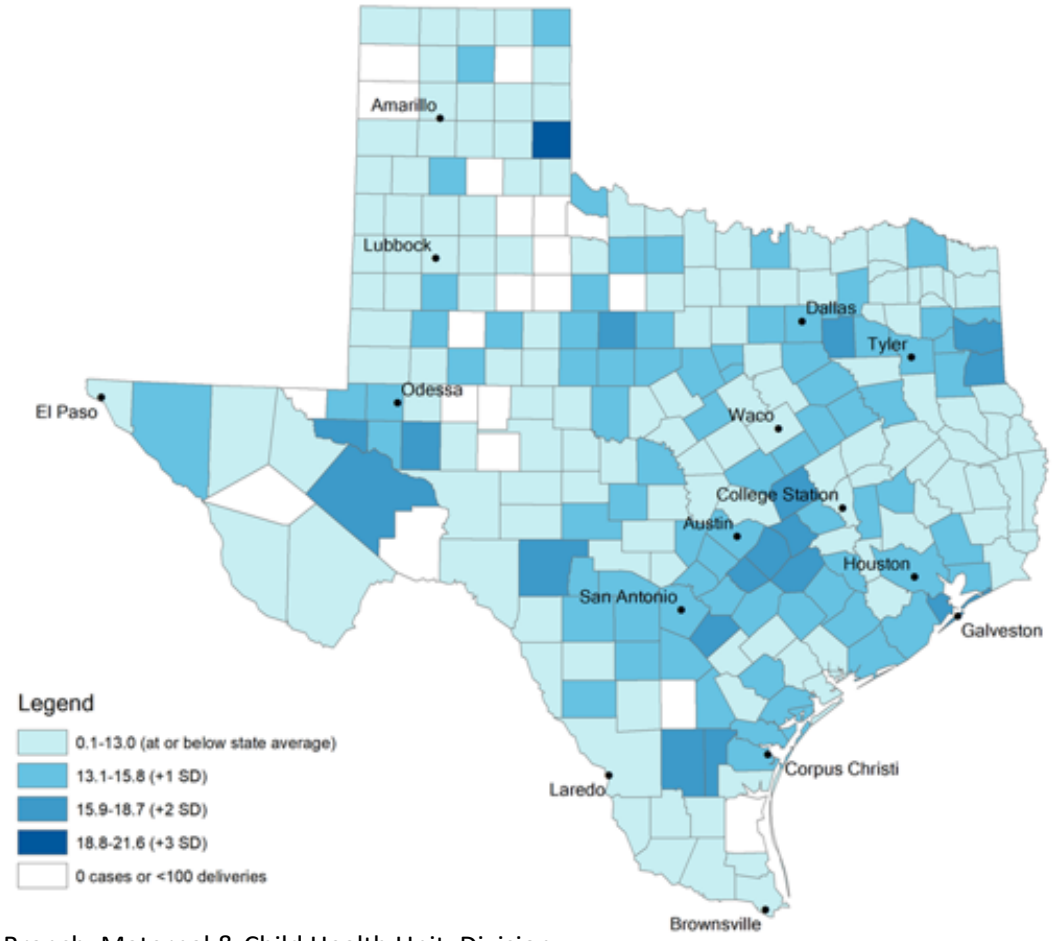
Disparity in Hypertension

Figure H-5: Rate of Delivery Hospitalization Involving Hypertensive Disorder per 10,000 Delivery Hospitalizations by County of Residence, Texas, 2013-2018[i]

Rates of delivery hospitalizations involving hypertensive disorder were highest among Non-Hispanic Black mothers and varied by county



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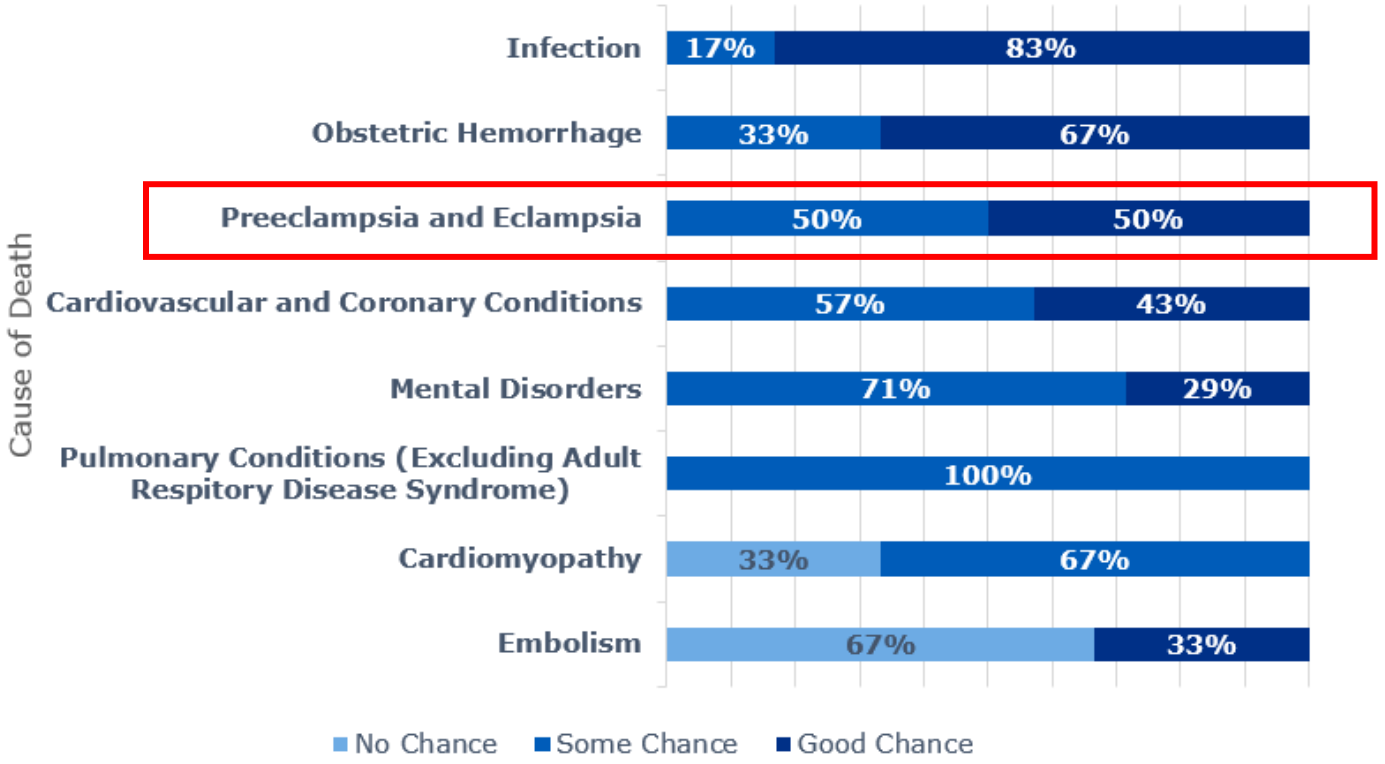
Preventability

ALL of the reviewed pregnancy-related deaths due to hypertensive disorders were believed to be *preventable*.

Chart F-3: Degree of Preventability for Top Underlying Causes of Reviewed Pregnancy-Related Deaths by Rating of Chance to Alter Outcome, Texas, 2013 (N=44 of 54 Reviewed Pregnancy-Related Deaths)[i]



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We are making progress!

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Solutions to address HTN-related mortality

- TexasAIM
- Maternal Early Warning Systems
- Telemonitoring
- Postpartum Clinics

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TexasAIM Safe Care for Every Mother

Texas AIM Program

Goal: end preventable maternal death and severe maternal morbidity

Hospitals and communities work with state teams and health systems to improve maternal safety through implementing safety bundles.

A Safety Bundle is a collection of nationally vetted best-practices designed to reduce morbidity and mortality due to a specific cause. The bundles focus on Readiness, Recognition, Response and Reporting.

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TEXAS Health and Human Services | Texas Department of State Health Services

THA Texas Hospital Association

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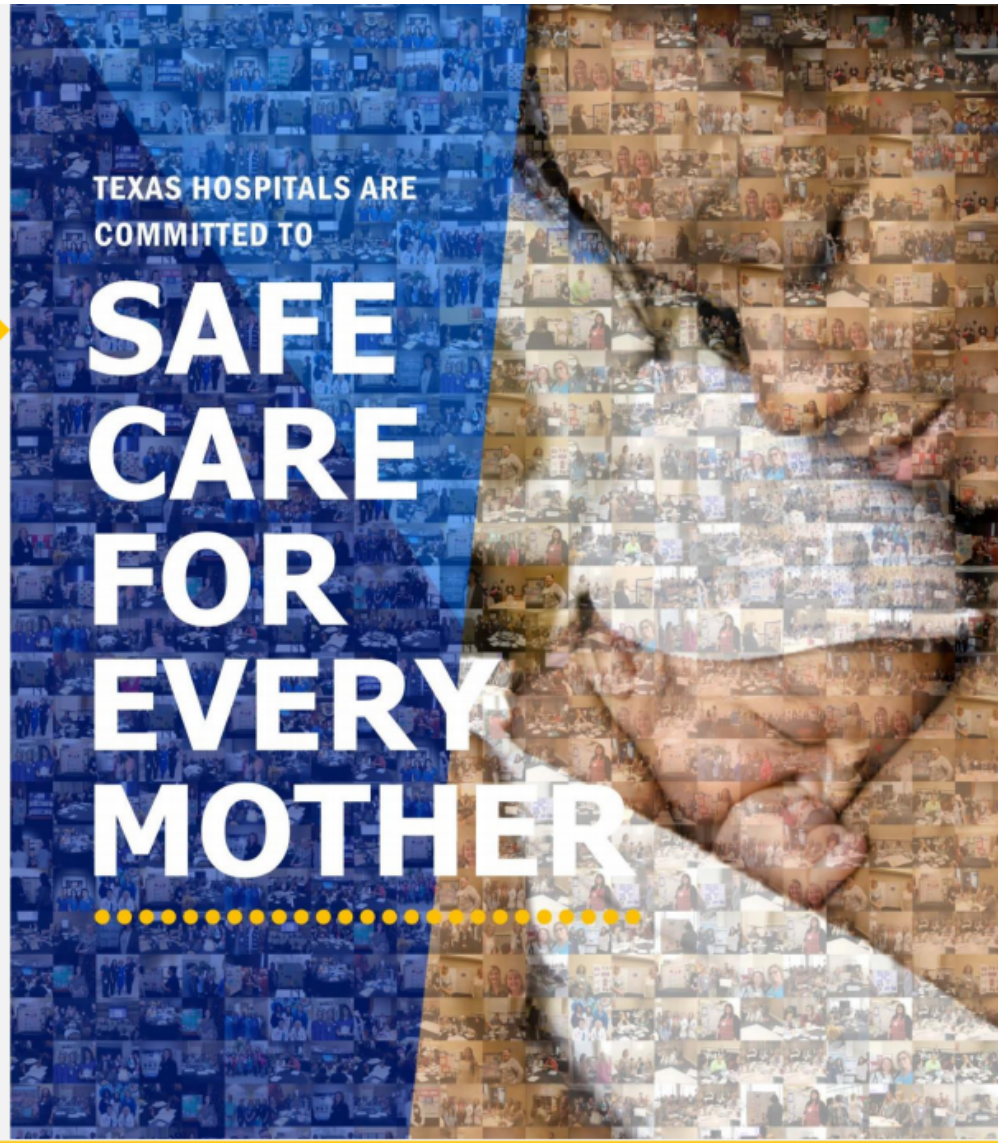
Provisional Finding

- 14% reduction from baseline (2016/2017) in the rate of Severe Maternal Morbidity* among Hemorrhage Cases occurring during initial intervention period [Oct. 2018-Dec. 2019].

*(*excludes cases with only a transfusion code)*



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Maternal Early Warning Systems

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Maternal Early Warning Systems

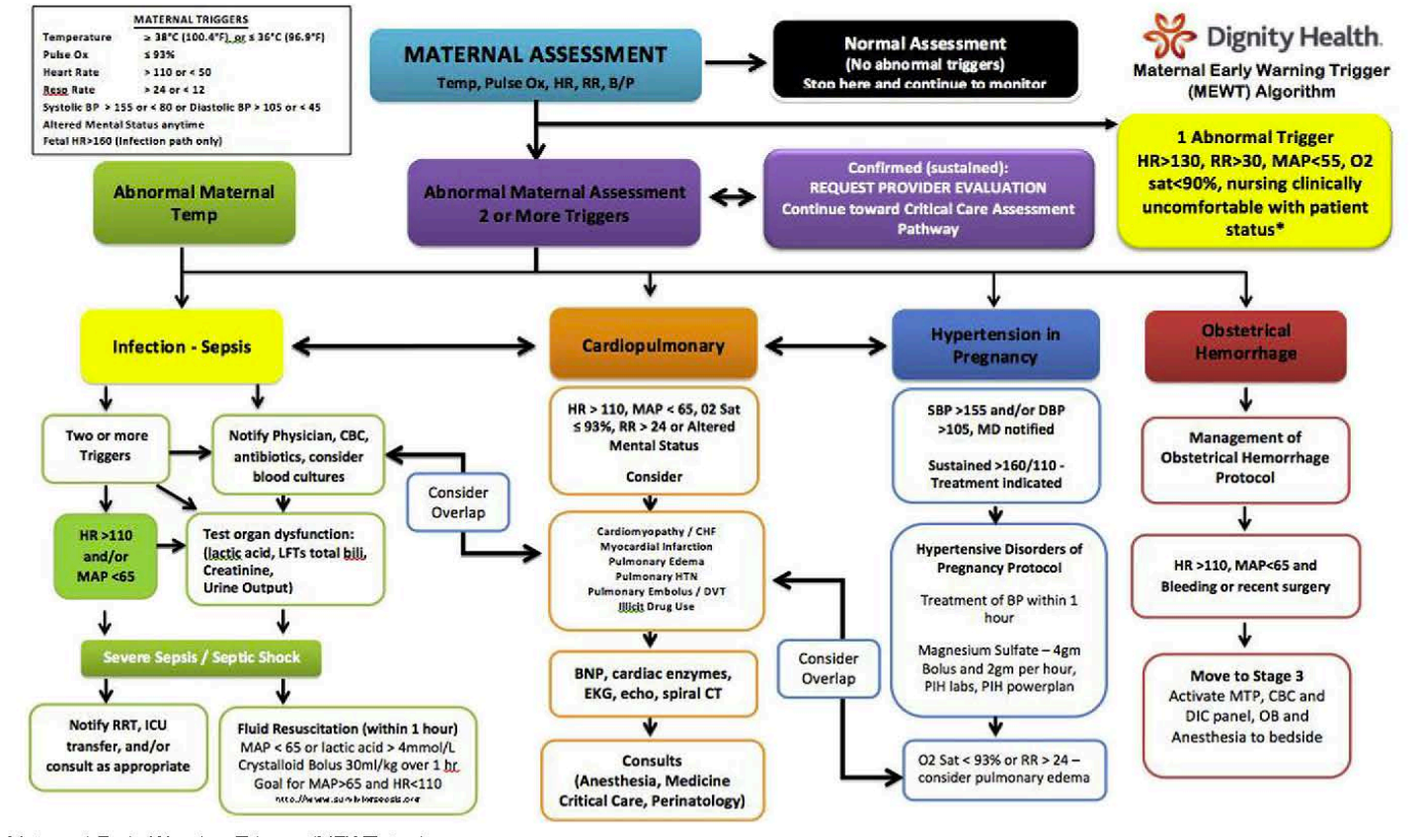
Table 1. The Maternal Early Warning Criteria

Systolic BP (mm Hg)	<90 or >160
Diastolic BP (mm Hg)	>100
Heart rate (beats per min)	<50 or >120
Respiratory rate (breaths per min)	<10 or >30
Oxygen saturation on room air, at sea level, %	<95
Oliguria, mL/hr for ≥2 hours	<35
Maternal agitation, confusion, or unresponsiveness; Patient with preeclampsia reporting a non-remitting headache or shortness of breath	

BP, blood pressure.

These triggers cannot address every possible clinical scenario that could be faced by an obstetric clinician and must not replace clinical judgment. As a core safety principle, bedside nurses should always feel comfortable to escalate their concerns at any point.

FIGURE
Flow diagram for maternal early warning trigger (MEWT) tool



Shields LE, Wiesner S, Klein C, Pelletreau B, Hedriana HL. Use of maternal early warning trigger tool reduces maternal morbidity. Am J Obstet Gynecol 2016;214:527.e1–527.e6.

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Maternal Early Warning Systems

TABLE 2
Results from pre- and post-Maternal Early Warning Trigger time periods

	Pre-MEWT	Post-MEWT	Trend	*P* value	Prenonpilot	Postnonpilot	Trend	*P* value	Postpilot vs postnonpilot *P* value
Deliveries	24221	12611			95,718	50,641			
CDC-SMM	2.0%	1.6%	↓	<.01	2.4%	2.4%	→	.9	<.01
Composite morbidity	5.9%	5.1%	↓	<.01	6.2%	6.2%	→	.9	<.01
Eclampsia/1000[a]	2.0	0.4	↓	<.01	1.1	1.1	→	.9	.02
Hemorrhage	2.9%	2.7%	↓	.1	3.2%	3.3%	↑	.5	<.01
Transfusion	0.7%	0.6%	↓	.5	0.7%	0.8%	↑	.01	.04
D&C/1000[a]	4.1	3.0	↓	.1	3.0	3.8	↑	.02	.2
Hysterectomy/1000[a]	0.94	0.63	↓	.3	0.95	0.95	↑	.9	.2
Sepsis/1000[a]	0.78	1.3	↑	.14	0.26	0.42	↑	.1	

CDC, Centers for Disease Control and Prevention; *D&C*, dilation and curettage; *MEWT*, Maternal Early Warning Trigger tool; *SMM*, severe maternal morbidity.

[a] Rate given per 1000 deliveries.

Shields et al. Maternal trigger tool and severe maternal morbidity. Am J Obstet Gynecol 2016.

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Postpartum Follow-up

A postpartum follow-up visit (early postpartum visit) with the obstetric care provider is recommended within 7–10 days of delivery for women with hypertensive disorders.

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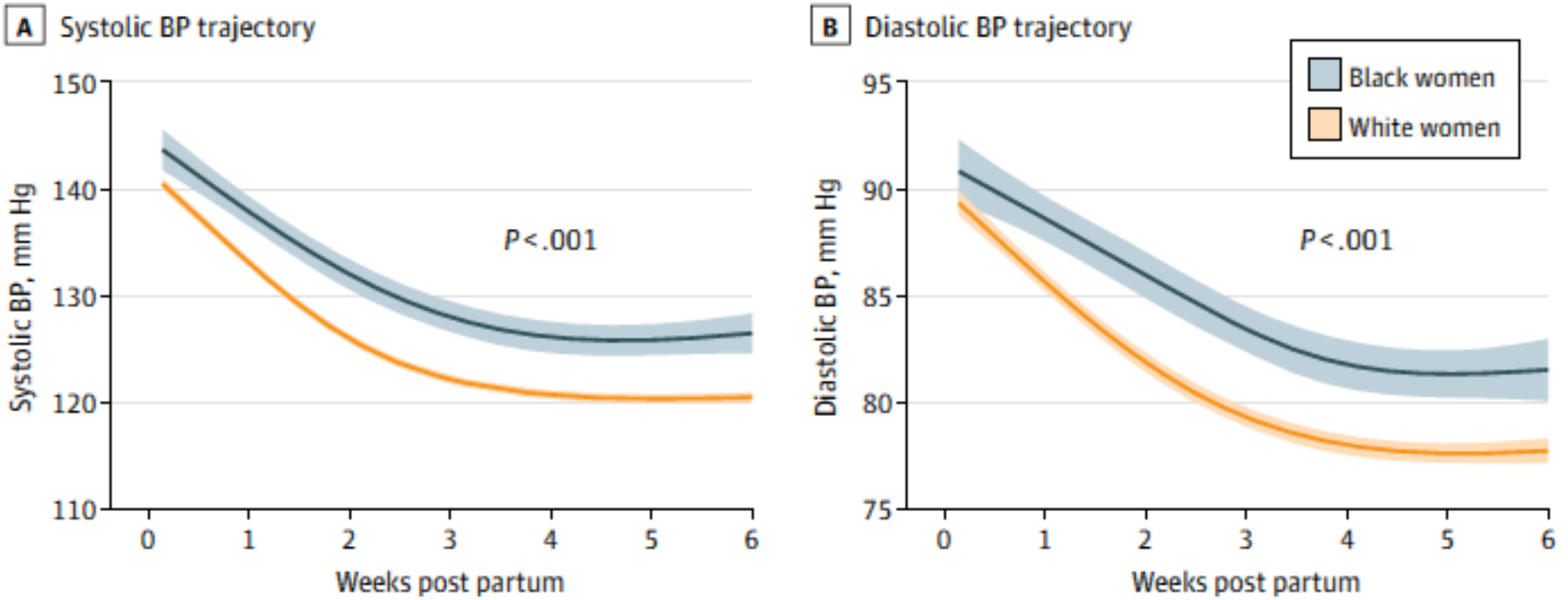
Telemonitoring



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Preeclampsia and Cardiovascular Disease

- Cardiovascular disease is the leading cause of death in the US
- Population-adjusted risk of cardiovascular mortality is greater for women than men, 20.9% versus 14.9%.
- Increasing evidence that pre-eclampsia is a risk factor for future cardiovascular and cerebrovascular events

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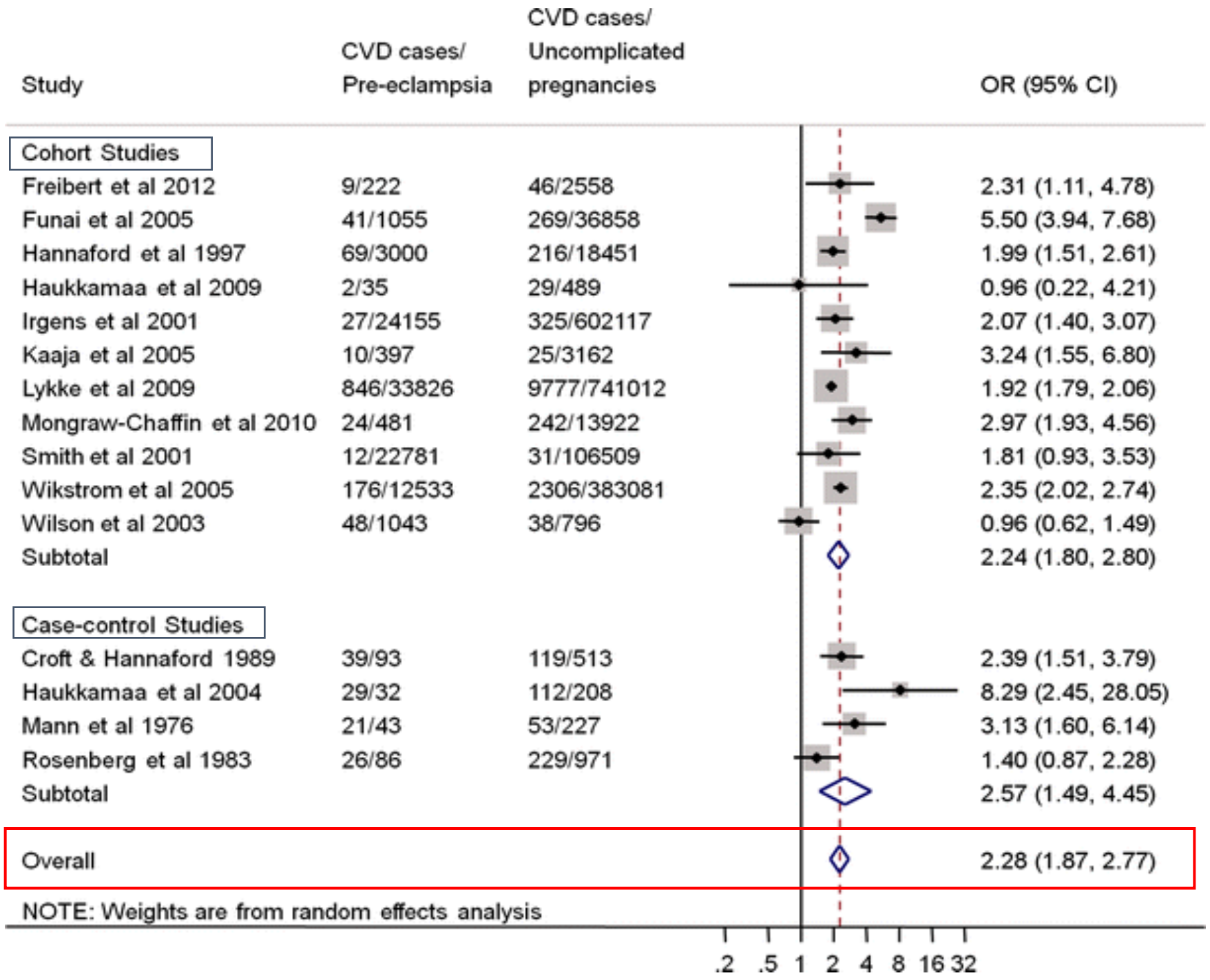

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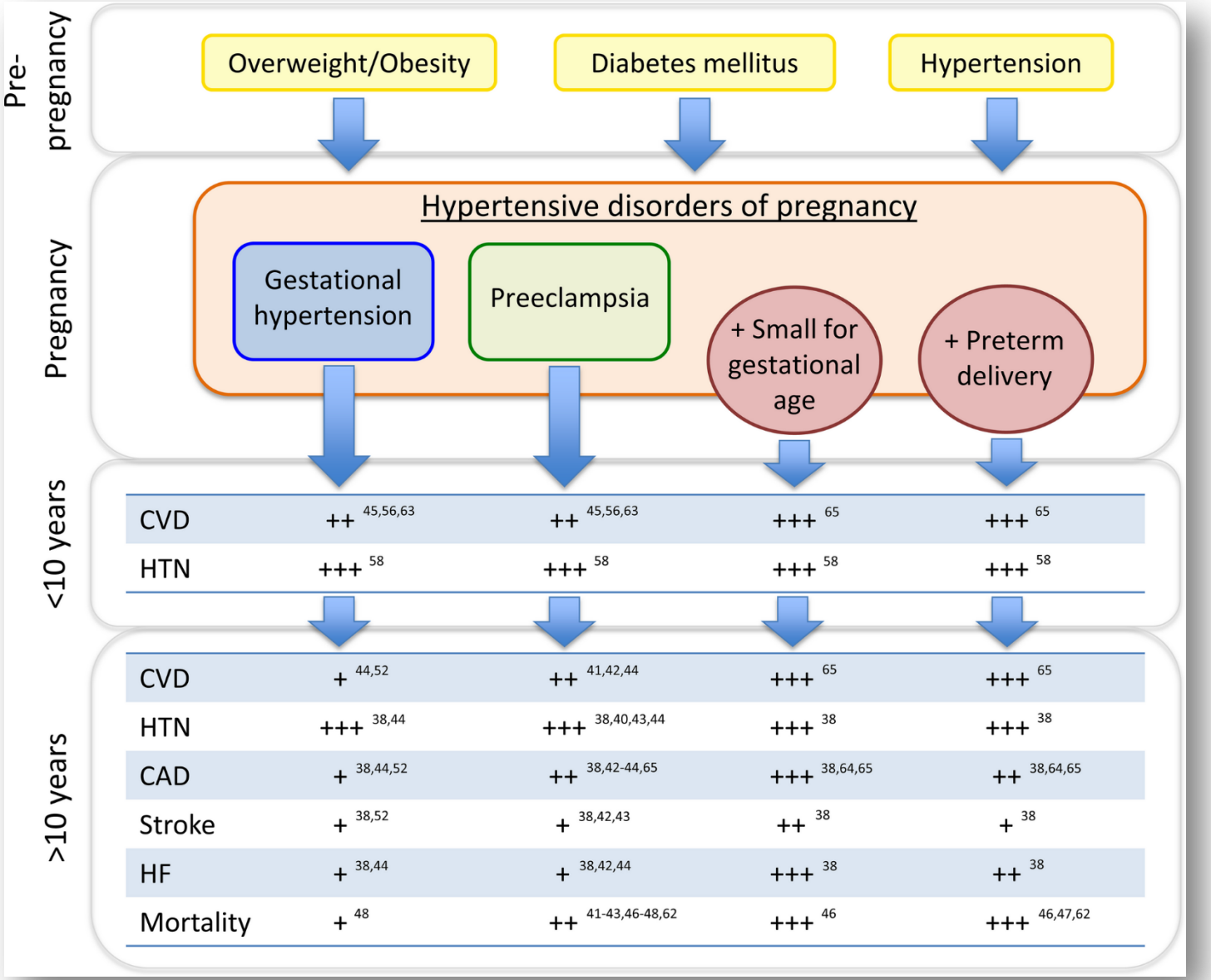

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Hypertensive Disorders of Pregnancy and Future Maternal Cardiovascular Risk, Volume: 7, Issue: 17, DOI: (10.1161/JAHA.118.009382)

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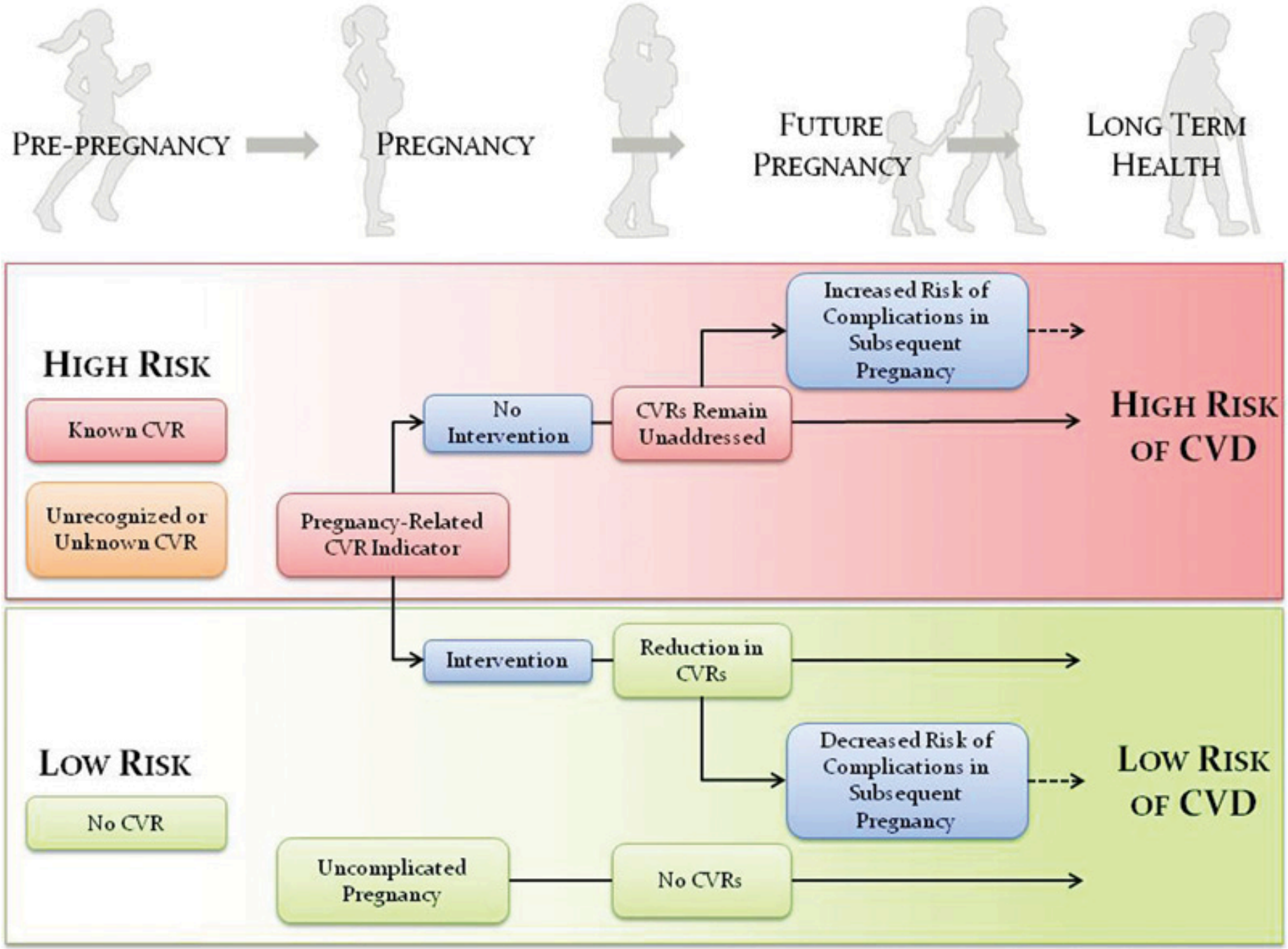
Specialized Clinics

- Development of structured postpartum cardiovascular screening programs for women after hypertensive disorders of pregnancy.
  - The Maternal Health Clinic -- Kingston General Hospital, Ontario, Canada
- Maternal Health Clinic targets women at risk of CVD based on obstetrical complications (e.g., hypertensive disorders of pregnancy, gestational diabetes mellitus, pre-term delivery, intrauterine growth restriction, etc.)
  - postpartum women undergo expanded cardiovascular risk screening including an assessment of traditional cardiovascular risk factors and pregnancy-related risk indicators.
- Direct long-term impact on risk reduction in the postpartum population remains to be seen.



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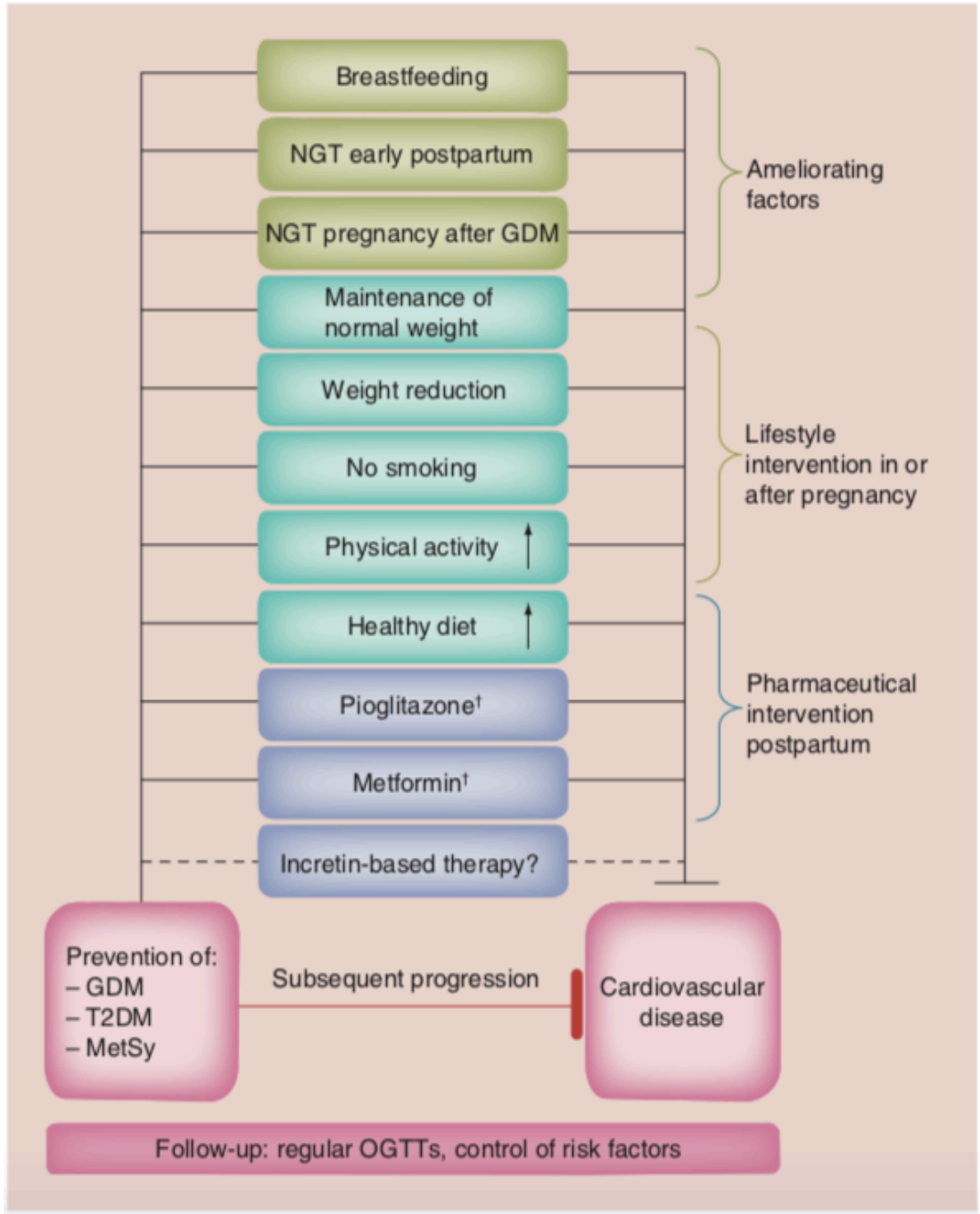

Women's Health (2014) 10(1), 91–108

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Thank You

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