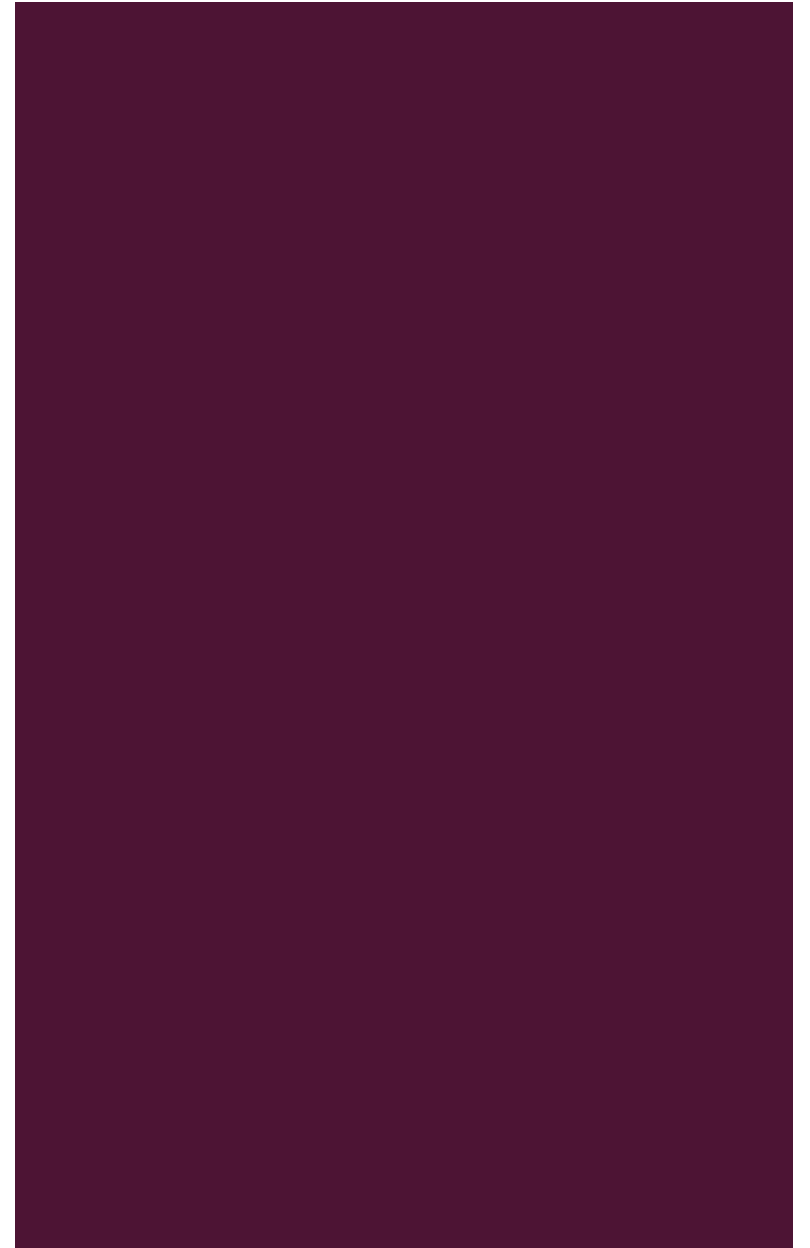


HIGH BLOOD PRESSURE IN PREGNANCY



OVERVIEW

- Provide background, purpose, and methods
- Present results
 - Selected characteristics
 - Maternal complications
 - Newborn complications
- Summary

Hypertensive Disorders of Pregnancy

Chronic Hypertension

Gestational Hypertension

Chronic Hypertension w/Superimposed Preeclampsia

Preeclampsia

Chronic vs Gestational Hypertension

Preeclampsia

HYPERTENSIVE DISORDERS DURING PREGNANCY

HYPERTENSION/PREECLAMPSIA

- Hypertensive disorders of pregnancy constitute one of the leading causes of maternal and perinatal mortality worldwide.
- Up to 50% of women with gestational hypertension will eventually develop preeclampsia.
- Between 20% to 50% of moms with hypertension will develop superimposed preeclampsia.
- Increased blood pressure (with preeclampsia) among moms may cause changes affecting the cardiovascular system, liver, and kidneys, which can have long-term implications.
- Risk of developing cardiovascular disease increases stepwise with severity of preeclampsia.
- Hypertension reduces the amount of blood flow to the placenta endangering fetus.

BACKGROUND

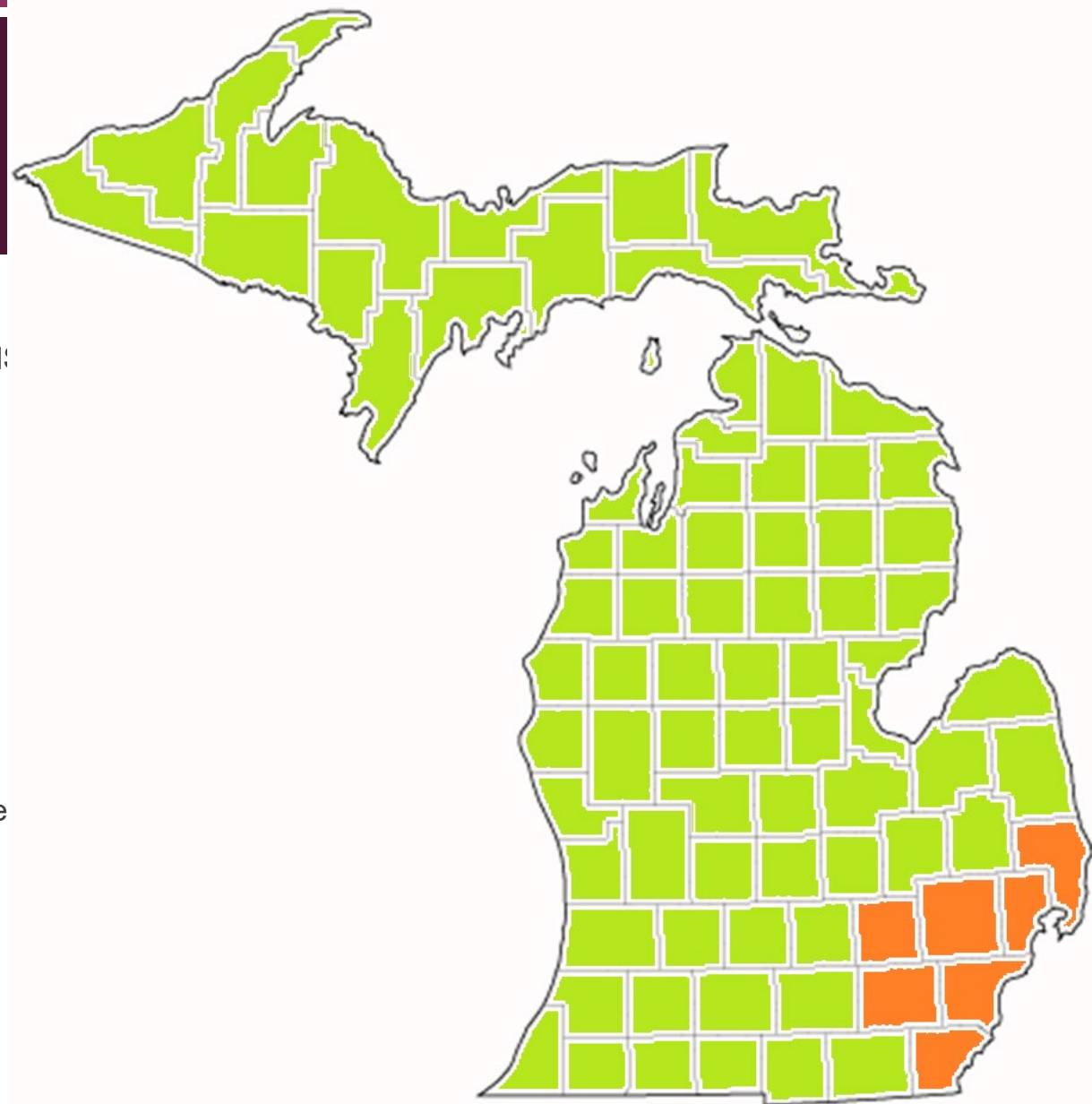
- Complications to mom and newborn include:
 - Kidney damage (preeclampsia)
 - Labor induction
 - Pre-term birth
 - Low-birth weight
- Risk factors and comorbidities include:
 - Tobacco use
 - Race/ethnicity
 - First time giving birth
 - Weight status
 - Preeclampsia during a previous pregnancy
 - Family history of preeclampsia
 - Type 1 or type 2 diabetes

METHODS

- Study Population - Michigan moms who had a live birth
- Year - 2016-2019
- Source - Michigan Pregnancy Risk Assessment Monitoring System (MIPRAMS)
- Outcome Measures
 - High blood pressure (HBP) prevalence overall and by selected characteristics
 - Complications during delivery and to newborn caused by HBP
 - HBP associated with risk of complication during delivery and for newborn
 - Account for other contributing factors using regression

WHAT IS PRAMS?

- Pregnancy Risk Assessment Monitoring System (PRAMS)
- 2,000 - 3,600 mothers (people who gave birth) per year receive a PRAMS survey.
- 50% - 60% complete the survey
- Oversample:
 - Low birth weight
 - African American (maternal race/ethnicity)
 - Southeast Michigan (orange)
- Survey completed 3-9 months post-partum
- Population-based survey
- Results weighted to number of pregnancies resulting in live birth each year
 - Equal to the number of mothers
 - About equal to the number of live births
- The term “Weighted Percent (%)” is defined as weighted population proportion of mothers (%).
- 95% CI represents 95% Confidence Interval.
- Statistical significance assessed using weighted Wald chi-square testing.



HIGH BLOOD PRESSURE INDICATOR

- High blood pressure during pregnancy was defined as moms having high blood pressure prior to pregnancy (question 4) or onset during pregnancy (question 25). The indicator consists of chronic and gestational high blood pressure, and preeclampsia/eclampsia.

4. During the 3 months before you got pregnant with your new baby, did you have any of the following health conditions? For each one, check **No** if you did not have the condition or **Yes** if you did.

	No	Yes
a. Type 1 or Type 2 diabetes (not gestational diabetes or diabetes that starts during pregnancy)	<input type="checkbox"/>	<input type="checkbox"/>
b. High blood pressure or hypertension	<input type="checkbox"/>	<input type="checkbox"/>
c. Depression	<input type="checkbox"/>	<input type="checkbox"/>
d. Asthma	<input type="checkbox"/>	<input type="checkbox"/>
e. Anemia (poor blood, low iron).....	<input type="checkbox"/>	<input type="checkbox"/>
f. Heart problems	<input type="checkbox"/>	<input type="checkbox"/>
g. Epilepsy (seizures)	<input type="checkbox"/>	<input type="checkbox"/>
h. Thyroid problems	<input type="checkbox"/>	<input type="checkbox"/>
i. PCOS (polycystic ovarian syndrome).....	<input type="checkbox"/>	<input type="checkbox"/>
j. Anxiety.....	<input type="checkbox"/>	<input type="checkbox"/>

For 2016-2019 Combined:
Yes to response b – 6.5% (95% CI: 5.8% - 7.2%)

25. During your most recent pregnancy, did you have any of the following health conditions? For each one, check **No** if you did not have the condition or **Yes** if you did.

	No	Yes
a. Gestational diabetes (diabetes that started during <i>this</i> pregnancy)	<input type="checkbox"/>	<input type="checkbox"/>
b. High blood pressure (that started during <i>this</i> pregnancy), pre-eclampsia or eclampsia.....	<input type="checkbox"/>	<input type="checkbox"/>
c. Depression.....	<input type="checkbox"/>	<input type="checkbox"/>
d. Kidney or bladder (urinary tract) infection (UTI)	<input type="checkbox"/>	<input type="checkbox"/>
e. Severe nausea, vomiting, or dehydration that sent me to the doctor or hospital	<input type="checkbox"/>	<input type="checkbox"/>

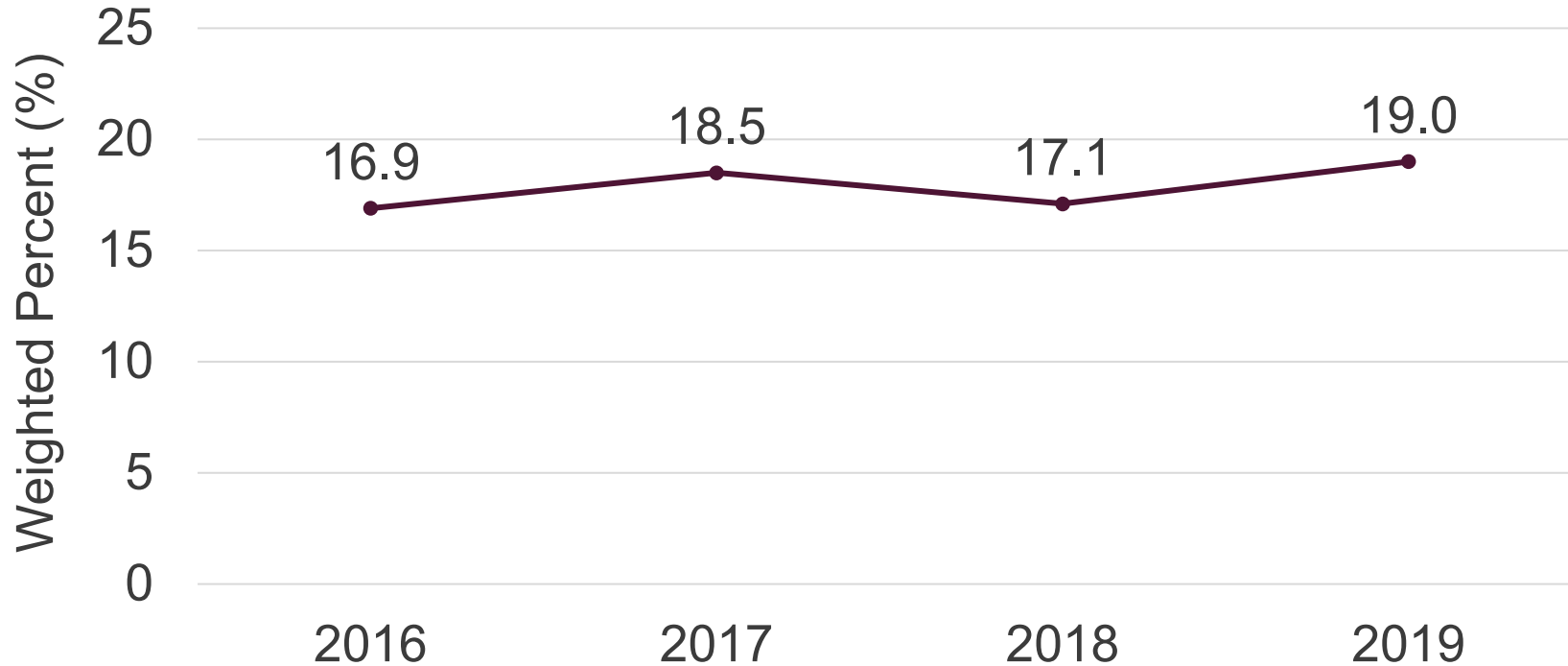
For 2016-2019 Combined:
Yes to response b – 13.5% (95% CI: 12.6% - 14.6%)

Yes to hypertension for either question:
17.9% (95% CI: 16.8%-19.0%)

HIGH BLOOD PRESSURE

Nearly one in five moms reported having high blood pressure during pregnancy.

High Blood Pressure Among Michigan Moms



High Blood Pressure
(2016-2019 Combined):
17.9% (95% CI: 16.8%-19.0%)

AGE GROUP

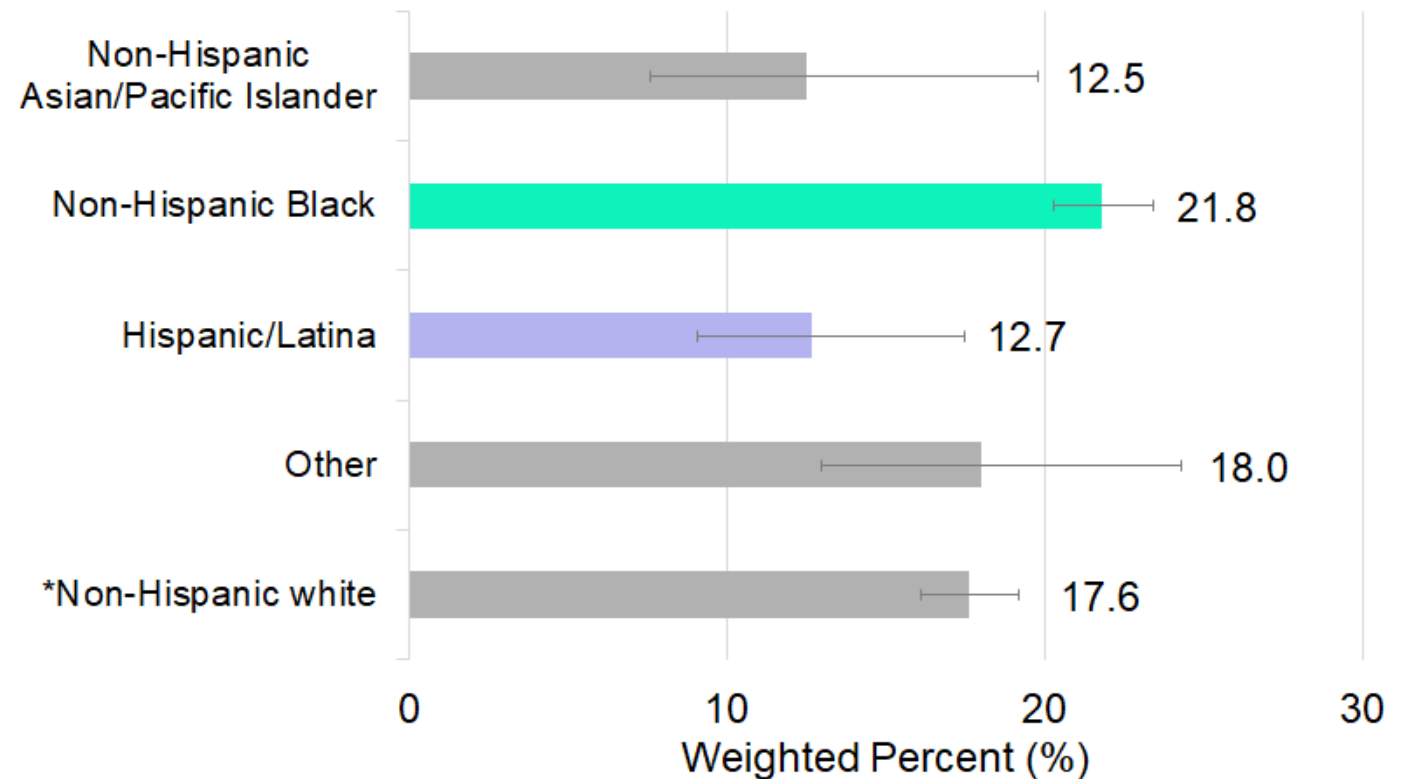
Age Group	High Blood Pressure % (95% CI)
Under 25 years	16.1 (13.9-18.6)
25-34 years	17.6 (16.2-19.1)
35 years and older	21.7 (18.8-24.8)

95% CI – 95% Confidence Interval

High blood pressure among moms age 35 and older was 35% higher compared to moms age 24 and under.

RACE/ETHNICITY

- High blood pressure:
 - 24% higher among non-Hispanic Black moms compared to non-Hispanic white moms.
 - Lower among Hispanic/Latino moms compared to non-Hispanic Black and white moms.



PARITY

- High blood pressure was significantly higher among new moms compared to moms who had at least one previous births (parity).

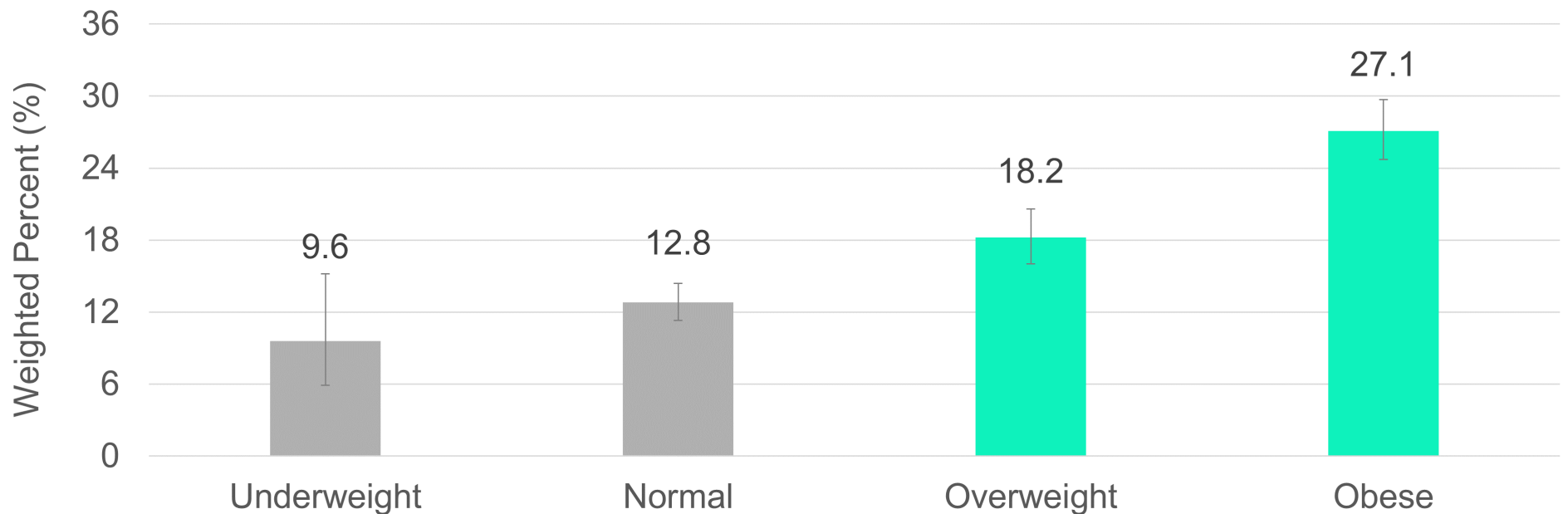
Parity*	High Blood Pressure % (95% CI)
No Previous Births	19.7 (17.9-21.8)
One Previous Birth	16.9 (15.0-19.0)
Two or More Previous Births	16.7 (14.8-18.7)

*The number of times that a female has given birth to a fetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn.

95% CI – 95% Confidence Interval

Source: Michigan Pregnancy Risk Assessment Surveillance System (2016-2019 Combined)

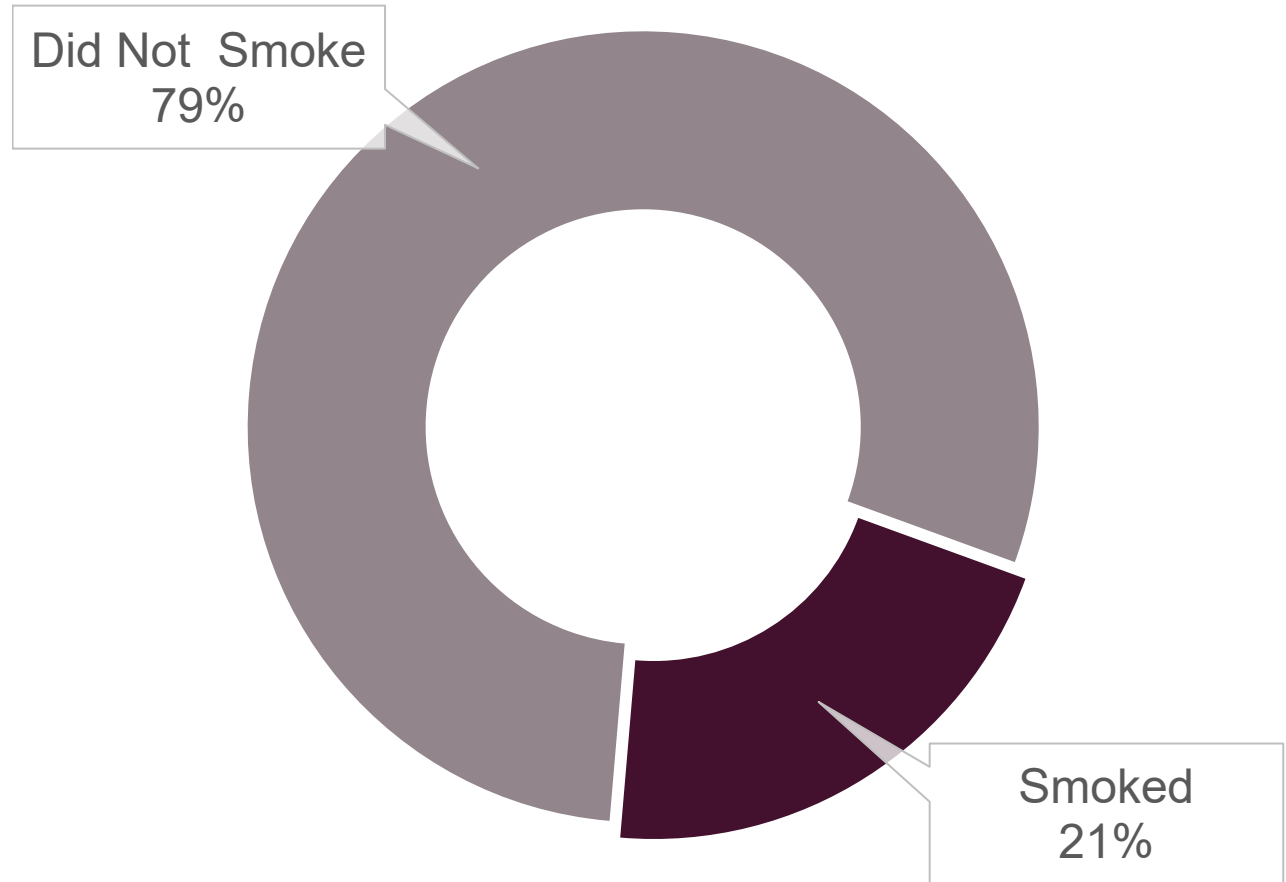
WEIGHT STATUS



- One in four moms who were obese prior to pregnancy had high blood pressure compared to one in eight moms who were normal weight status.

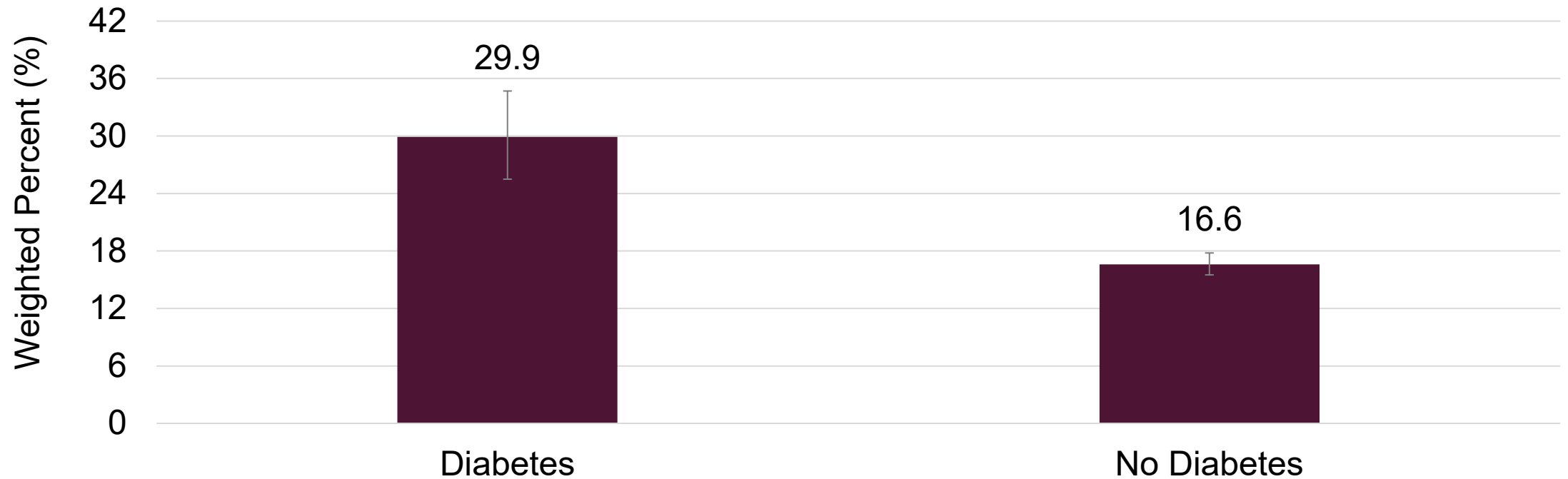
SMOKING

- One in five moms with high blood pressure reported smoking three months prior to pregnancy.



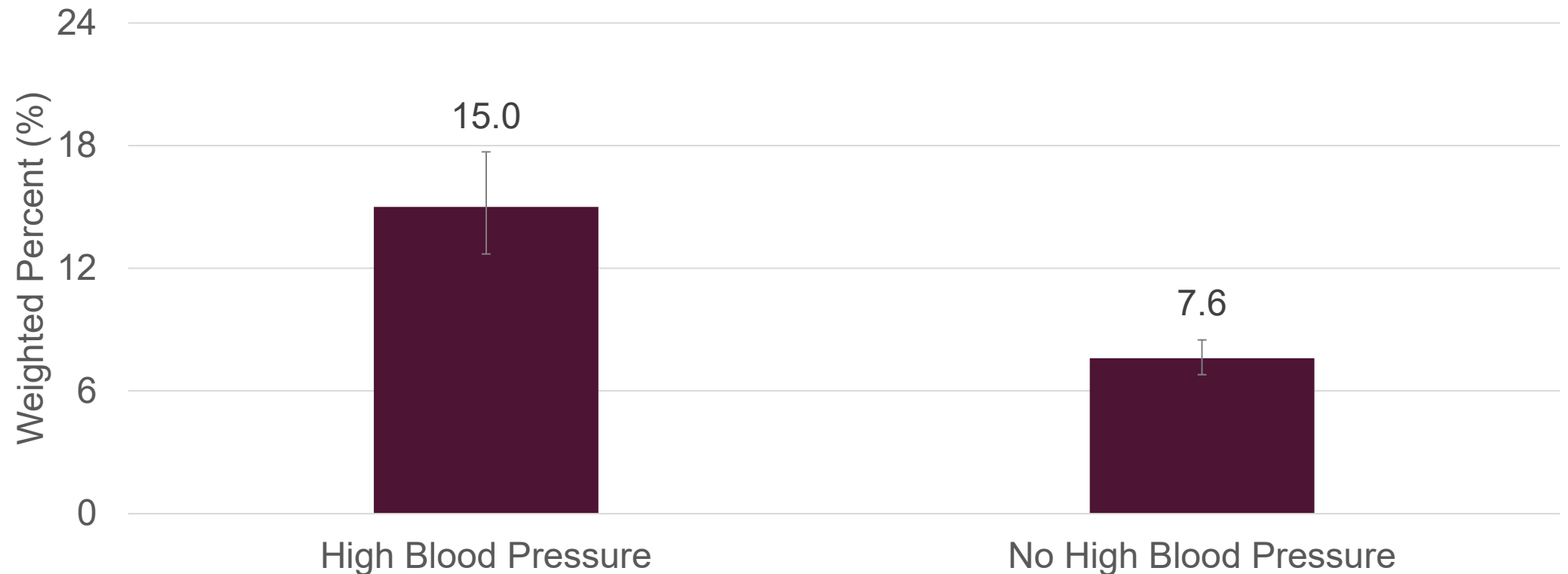
Source: Michigan Pregnancy Risk Assessment Surveillance System (2016-2019 Combined)

HIGH BLOOD PRESSURE BY DIABETES STATUS



- Three in 10 moms with diabetes also had high blood pressure compared to one in six moms without diabetes.

DIABETES BY HIGH BLOOD PRESSURE STATUS



- Diabetes among moms with high blood pressure was double that of moms without high blood pressure.

ADDITIONAL INDICATORS

- About one in five moms with less than a college degree had high blood pressure compared to one in seven moms with a college degree or higher.
- High blood pressure was comparable based on insurance status or the number of stressors during pregnancy.

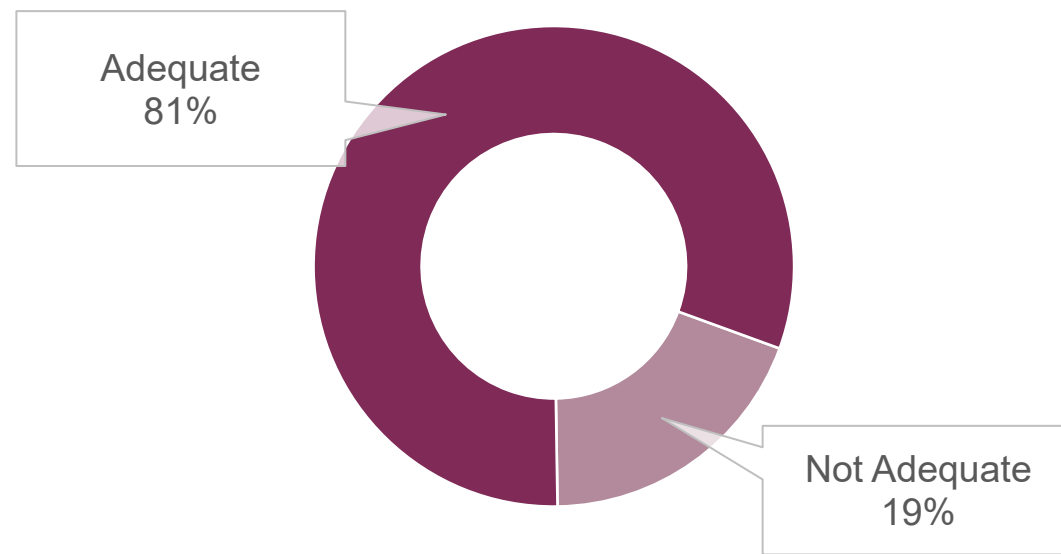
ADEQUATE PRENATAL CARE*

- There was no relationship between HBP and adequate pre-natal care.*
- Neither group met the goal of 100% adequate prenatal care.

High Blood Pressure



No High Blood Pressure

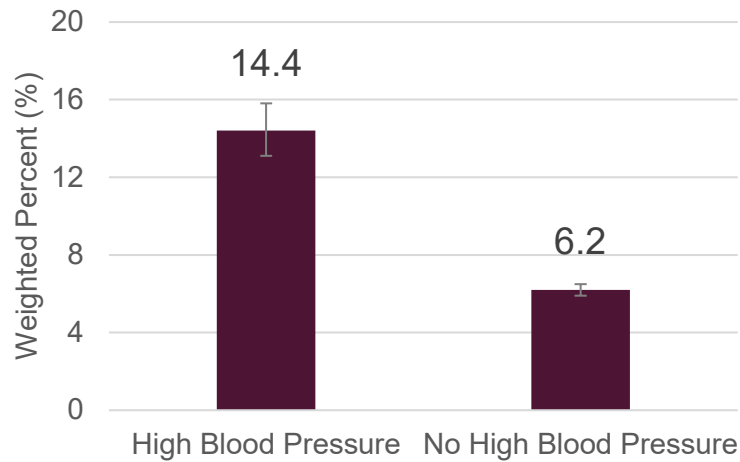


*The Kotelchuck index measures whether moms had adequate prenatal care based on the number and frequency of prenatal visits. It does not measure the quality of care.

Source: Michigan Pregnancy Risk Assessment Surveillance System (2016-2019 Combined)

COMPLICATIONS

Low Birthweight Newborn*

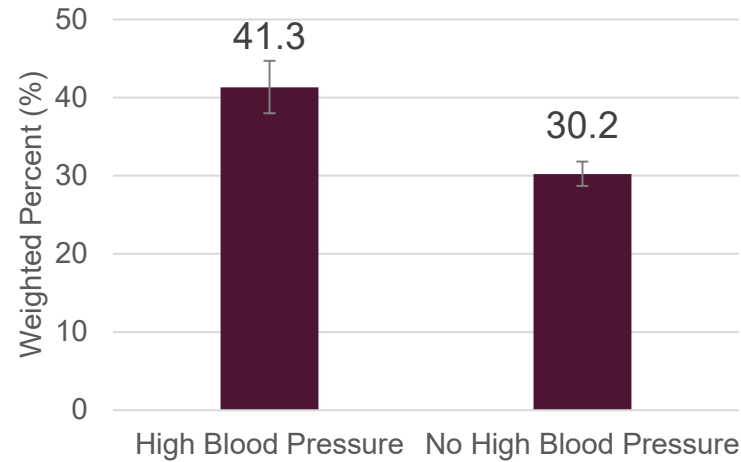


RISK: ~ 3 times

*weighing 5.5 pounds (2500 grams) or less

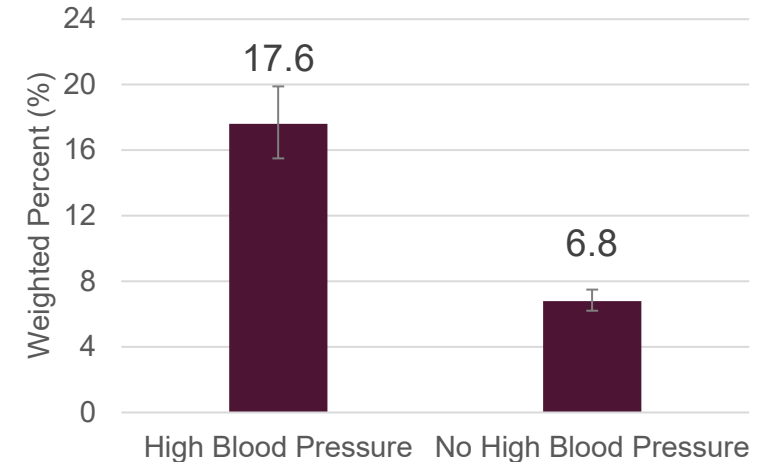
- The risk of a mom with high blood pressure having a low birthweight newborn 2.9 times as that of moms without hypertension.

Cesarean Delivery



RISK: ~ 1.2 times (18%)

Pre-term Birth**



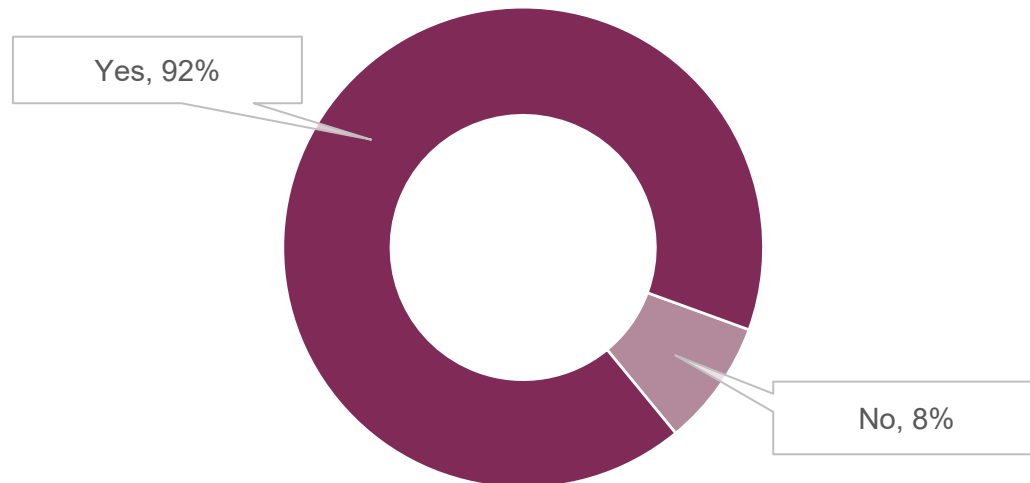
RISK: 2.8 times

**defined as 20 0/7 weeks and 36 6/7 weeks

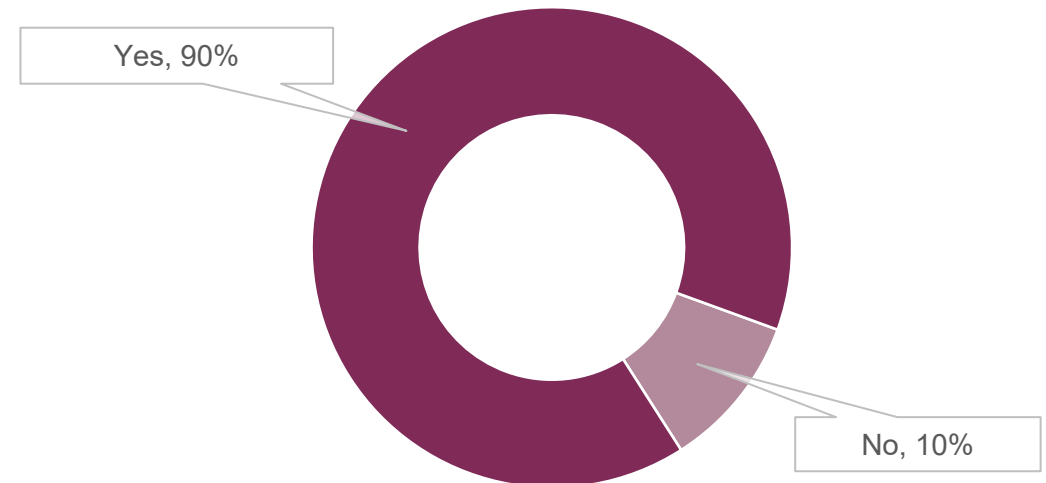
Source: Michigan Pregnancy Risk Assessment Surveillance System (2016-2019 Combined)

POST-PARTUM EXAMINATION

High Blood Pressure



No High Blood Pressure



Ninety percent of moms with high blood pressure reported having their post-partum examination four to six weeks after birth. Neither group met the goal of 100% have exam.

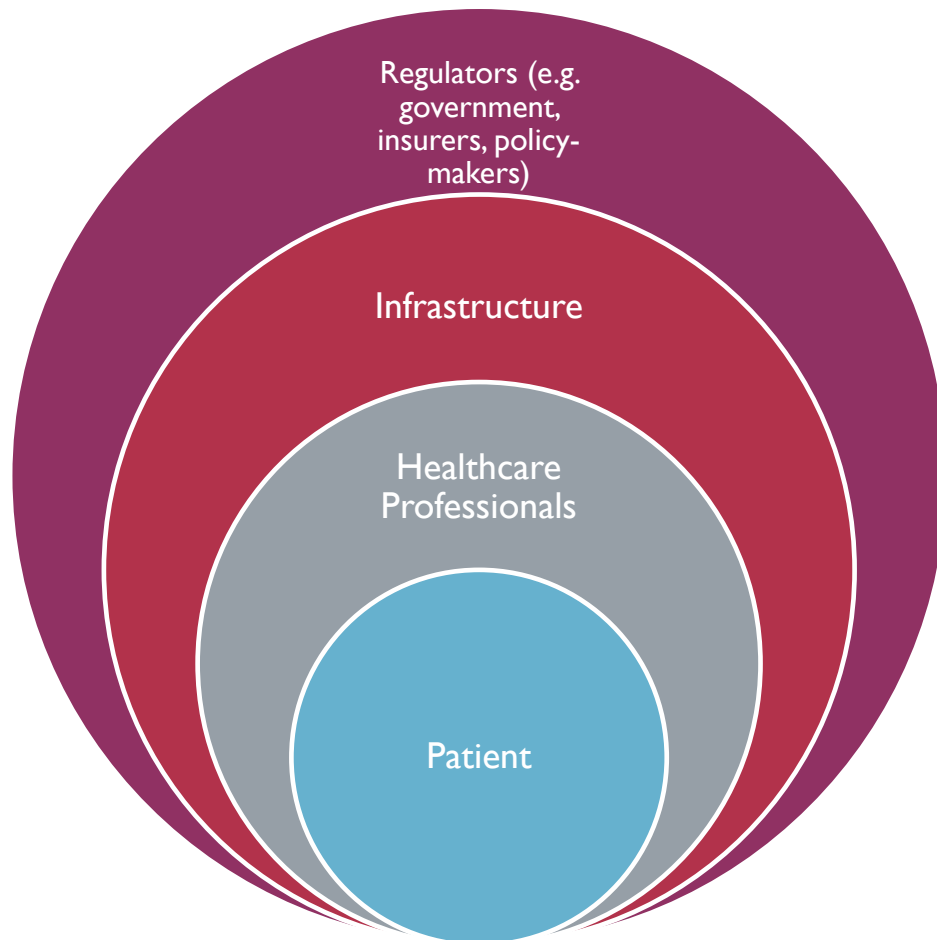
SUMMARY

- In 2019, 19.0% of Michigan mothers who had a live birth had high blood pressure (HBP) during pregnancy.
- HBP tended to be higher among moms:
 - Age 35 and older compared to younger age groups;
 - Non-Hispanic Black compared to other racial-ethnic groups;
 - Pre-existing and gestational diabetes status;
 - Overweight or obese compared to healthy weight.

SUMMARY

- There was no relationship between HBP and adequate pre-natal care.
- One in five moms reported smoking three months prior to pregnancy.
- Mom's with HBP had a higher risk of pre-term birth, cesarean delivery, and low birthweight newborn.
- Ninety percent of moms with high blood pressure reported having their post-partum examination four to six weeks after birth.

WHAT CAN BE DONE?



- The socioecological model framework provides a broad approach to addressing health.
- The model emphasizes how various systems interrelate ultimately impacting the individual or patient level.
- It recognizes that behavior change can be achieved through activities that target four levels: Individual (patient), interpersonal (healthcare professionals), community (infrastructure) and social/structural (regulators).

PATIENTS

- Learn about the risk of high blood pressure and how you can control it.
- See a doctor for regular prenatal checkups.
- Eat healthy food and beverages that are nutrient rich and include colorful fruits and vegetables, whole grains, and lean meats.
- Find ways to be physically active, take a brisk walk, engage in family play time.
- Avoid smoking or exposure to secondhand smoke.
- Learn about healthy ways to manage stress.

HEALTHCARE PROFESSIONALS

-
- Provide follow-up guidance and instructions for next steps in patient care.
 - Equip patients to use self-measured blood pressure monitoring and medication adherence strategies.
 - Collaborate with community health workers and other lay health partners to link patients to additional health and social services.
 - Make referrals to outside resources, such as evidence-based lifestyle change programs as needed.

INFRASTRUCTURE (HOSPITALS, CLINICS)

- Engage community health workers as outreach, enrollment, and information agents to improve health behaviors (physical activity, healthful eating habits, and smoking cessation) in clients at increased risk for CVD.
- Tailor pharmacy-based interventions that aim to help patients who are at risk for cardiovascular disease take their medications as prescribed.
- Incorporate food insecurity screening and linkages to resources into OB-GYN/prenatal visits.

POLICIES AND ENVIRONMENT (REGULATORS)

- Institute public and private payor policies that provide reimbursement for:
 - Nutrition evaluation and counselling services;
 - Postpartum blood pressure checks;
 - Participation in evidence-based lifestyle change programs for hypertension management and control.
- Provide healthy food prescription programs as a covered benefit.
- Create healthy built environments for active living by increasing connectivity to everyday destinations and recreation.
- Increase access to and affordability of nutritious foods.



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