Michigan Department of Health & Human Services
GRETCHEN WHITMER, GOVERNOR | ROBERT GORDON, DIRECTOR

PRECONCEPTION HEALTH IN MICHIGAN
FACT SHEET (2020)

Nutrition and Physical Activity

Preconception Health

Preconception health refers to the health and well-being of women prior to becoming pregnant either for the first time or with subsequent pregnancies. Improving the preconception health of women can improve maternal and infant health outcomes.[1,2,3] Preconception health encompasses biomedical, behavioral, and social factors. Most pregnancy-related deaths are caused by cardiovascular disease and other chronic conditions, most of which are preventable.[4,5] Improving healthy eating and physical activity can help prevent many chronic conditions. Additionally, many women during pregnancy do not seek prenatal care until eight weeks of gestation or later, at which time period that carries the highest risk for the fetus has already passed.[3] Access to the social and physical determinants of preconception health can help improve future pregnancy and perinatal outcomes.

Preconception Health Indicators

A national committee of state program leaders and epidemiologists identified broad health domains related to preconception health, and has proposed specific health indicators based on currently measurable data for women of reproductive age.[2] These indicators are used to monitor public health status and help assess progress toward national and state goals.

The information in these factsheets encompasses the Nutrition and Physical Activity domain:

- Fruit and Vegetable Consumption
- Folic Acid Supplementation
- Overweight and Obesity
- Exercise and Physical Activity

Healthy People 2020 Goals

The Healthy People 2020 (HP 2020) Goals are a set of science-based goals created by a national multi-disciplinary group with the objective of improving the health and well-being of all people in the United States.[3] In these factsheets, the HP 2020 Goal is represented by a dashed line and an arrow demonstrating whether it is more desirable to be above or below the goal.

Nutrition and Physical Activity

Summary of Key Points

- Most women aged 18-44 years did not report adequate fruit and vegetable consumption, prenatal multivitamin use, or physical activity.
- While the prevalence of prenatal multivitamin use in 2018 exceeded the HP 2020 Goal, several significant disparities were evident based on age, race, educational attainment, household income, and health insurance status.
- The prevalence of adequate physical activity in 2017 did not achieve the HP 2020 Goal, and significant disparities were evident based on race, educational attainment, household income, and health insurance status.
- Over 56 percent of Michigan women in 2018 were overweight (26.3 percent) or obese (30.5 percent) at the time they became pregnant. The prevalence of prenatal obesity was higher among black women compared to white women.

Figure 1. Prevalence of women aged 18-44 years with self-reported positive indicators, or those which would ideally increase over time with improved health (MI BRFSS*, 2017 & MI PRAMS^, 2018)

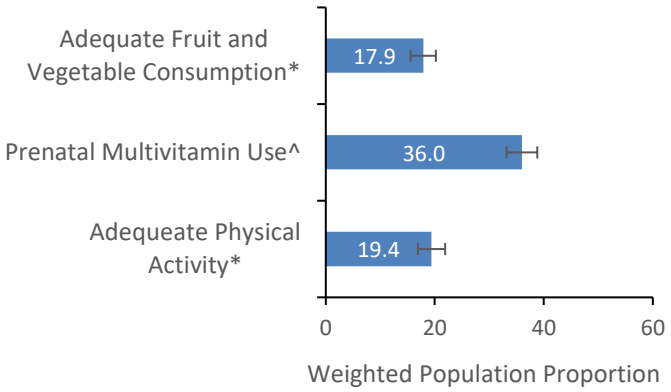
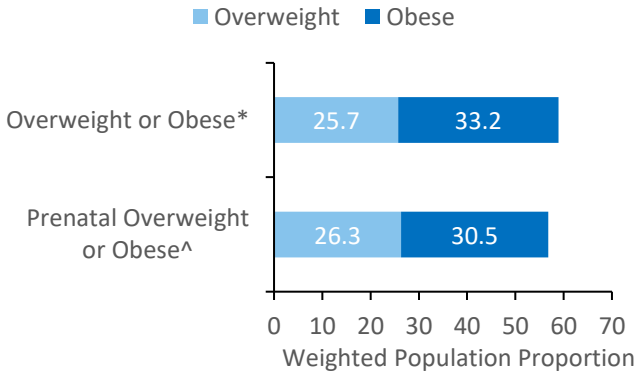


Figure 2. Prevalence of women aged 18-44 years with self-reported negative indicators, or those which would ideally decrease over time with improved health (MI BRFSS*, 2018 & MI PRAMS^, 2018)



* MI-BRFSS: women aged 18-44 years
^ MI-PRAMS: women aged 18-44 years with a recent live birth

Nutrition and Physical Activity

Fruit and Vegetable Consumption

Low birthweight and prematurity are associated with maternal dietary inadequacy before becoming pregnant. The diets of mothers with low birthweight infants are frequently deficient in fruits and vegetables.[6] Fruits and vegetables are important sources of vitamins, including folic acid and Vitamin A, which are essential for healthy fetal development. Growth of the placenta and fetus is most susceptible to the effects of maternal nutrition during the pre-implantation period through the first few weeks of gestation.[7] Typically, this occurs before pregnancies are confirmed. Women of reproductive age, especially those planning to become pregnant, can improve the ability of their bodies to support a full-term pregnancy by eating a well-balanced diet including fruits, vegetables, and foods containing calcium, protein, iron, Vitamin C, and folic acid.[7]

Key Points (MI BRFSS, 2017)

Most women aged 18-44 years did not have adequate fruit and vegetable consumption.

Preconception Health Indicator

Percentage of women aged 18-44 years who consume fruits (including juice) and vegetables at least 5 times per day.

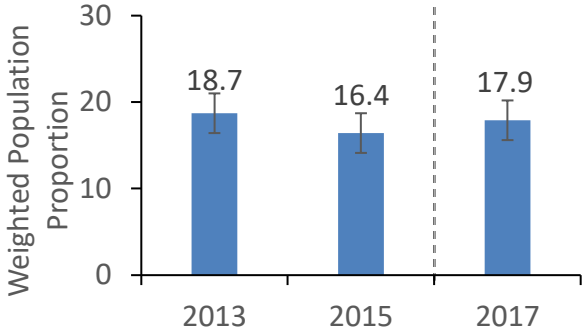
Healthy People 2020 Goals

Increase the contribution of fruits and vegetables to the diets of the population aged 2 years and older.

Trends Over Time

The prevalence of adequate fruit and vegetable consumption decreased 12.3 percent from 2013 to 2015.

Figure 3. Prevalence of women aged 18-44 years with self-reported adequate fruit and vegetable consumption[a] by year (MI BRFSS, 2013, 2015 & 2017*)



[a] Consumption of fruits (including juice) and vegetables at least 5 times per day
* Due to BRFSS question and methodology changes for fruit and vegetable consumption, 2017 BRFSS estimate cannot be compared to BRFSS estimates from previous years.

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Nutrition and Physical Activity

Fruit and Vegetable Consumption

Figure 4. Prevalence of women aged 18-44 years with self-reported adequate fruit and vegetable consumption[a] by age (MI BRFSS, 2017)

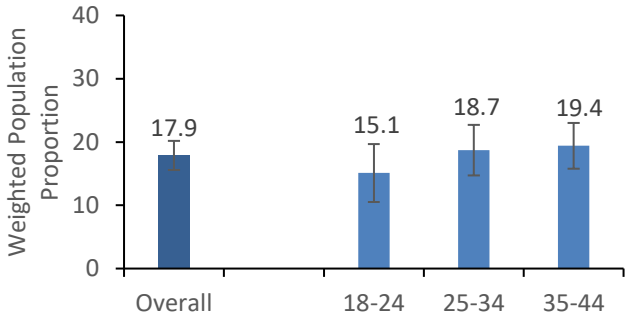


Figure 5. Prevalence of women aged 18-44 years with self-reported adequate fruit and vegetable consumption[a] by race (MI BRFSS, 2017)

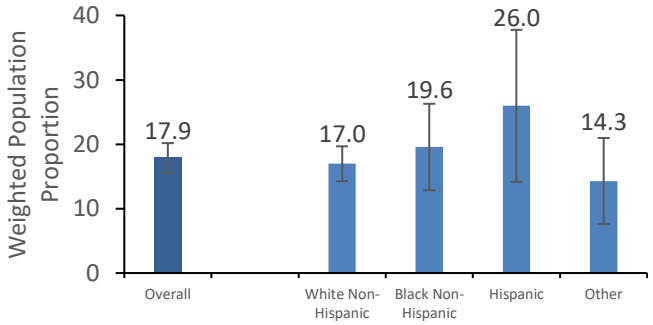


Figure 6. Prevalence of women aged 18-44 years with self-reported adequate fruit and vegetable consumption[a] by education (MI BRFSS, 2017)

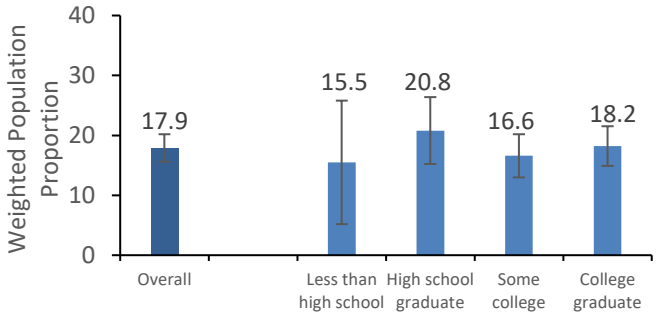


Figure 7. Prevalence of women aged 18-44 years with self-reported adequate fruit and vegetable consumption[a] by household income (MI BRFSS, 2017)

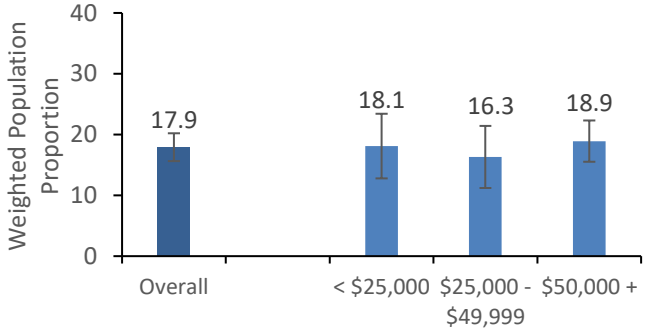
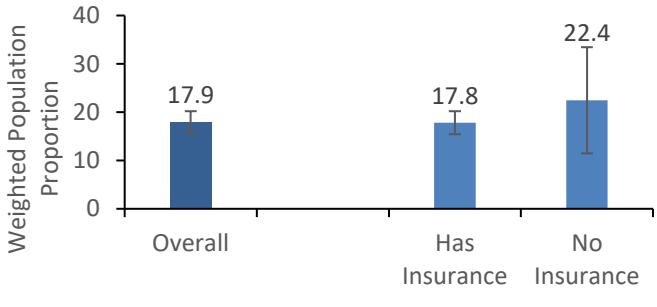


Figure 8. Prevalence of women aged 18-44 years with self-reported adequate fruit and vegetable consumption[a] by type of health insurance (MI BRFSS, 2017)



Key Points

The prevalence of adequate fruit and vegetable consumption was lower among:

- Women aged 18-24 years
- White non-Hispanic women
- Women with less than high school educational attainment
- Women with a household income of $25,000-$49,999/year

[a] Consumption of fruits (including juice) and vegetables at least 5 times per day

Nutrition and Physical Activity

Folic Acid Supplementation

Maternal nutrition in the preconception period and during pregnancy is critically important for fetal development.[8] There is a considerable amount of evidence that synthetic folic acid supplementation in the preconception period and early gestation has protective mechanisms against several congenital malformations,[8,9,10] and is also associated with decreased risk for low birthweight and small for gestational age.[8] With dietary supplementation, certain congenital malformations called neural tube defects (NTDs) can be decreased by 60-70 percent.[1,10,11] Folate is important for the synthesis of DNA and protein, and for regulation of DNA expression.[9] Additional folic acid intake is needed among these women to achieve the recommended 400 µg/day and to achieve red blood cell folate concentrations consistent with optimal prevention of NTDs.[12] For optimal protective effects, it is recommended that all women who are capable of pregnancy to take a daily supplement containing 400 to 800 µg of folic acid.[11] The critical period for folic acid supplementation starts at least 1 month before conception and continues through the first 2 to 3 months of pregnancy.[11]

Preconception Health Indicator

Percentage of women aged 18-44 years having a live birth who took a multivitamin or prenatal vitamin daily during the month before conception.

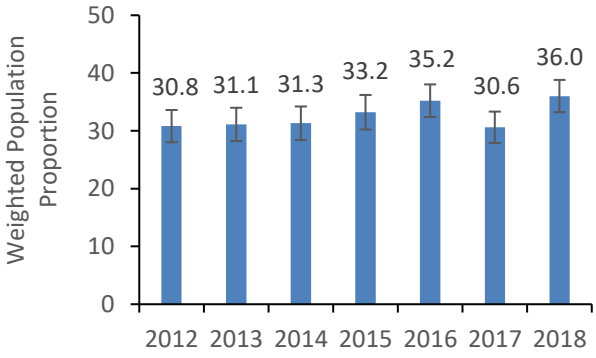
Healthy People 2020 Goals

Increase the proportion of women delivering a live birth who took multivitamins/folic acid prior to pregnancy to 33.3 percent.

Trends Over Time

The prevalence of prepregnancy multivitamin or prenatal vitamin daily use increased 16.9 percent from 2012 to 2018. Most women aged 18-44 did not have adequate folic acid supplementation one month prior to conception.

Figure 9. Prevalence of women aged 18-44 years having a live birth with self-reported prepregnancy multivitamin or prenatal vitamin use[a] by year (MI PRAMS, 2012-2018)



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Nutrition and Physical Activity

Folic Acid Supplementation

Figure 10. Prevalence of women aged 18-44 years with a recent live birth who self-reported prepregnancy multivitamin or prenatal vitamin use[a] by age (MI PRAMS, 2018)

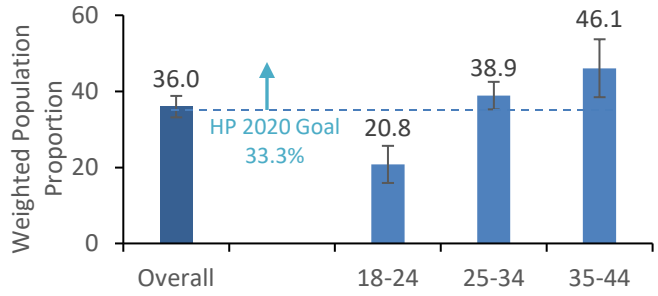


Figure 11. Prevalence of women aged 18-44 years with a recent live birth who self-reported prepregnancy multivitamin or prenatal vitamin use[a] by race (MI PRAMS, 2018)

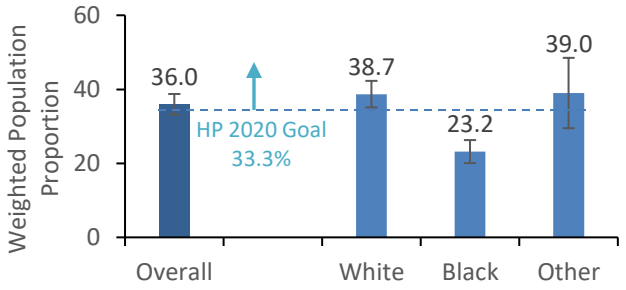


Figure 12. Prevalence of women aged 18-44 years with a recent live birth who self-reported prepregnancy multivitamin or prenatal vitamin use[a] by education (MI PRAMS, 2018)

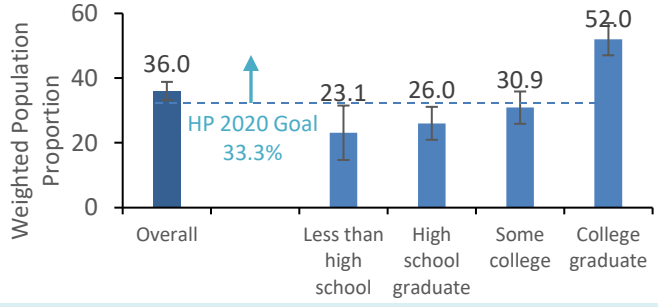


Figure 13. Prevalence of women aged 18-44 years with a recent live birth who self-reported prepregnancy multivitamin or prenatal vitamin use[a] by household income (MI PRAMS, 2018)

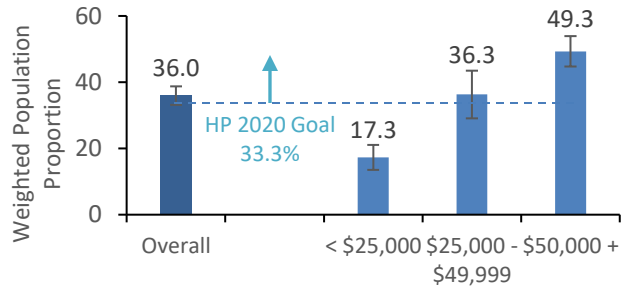
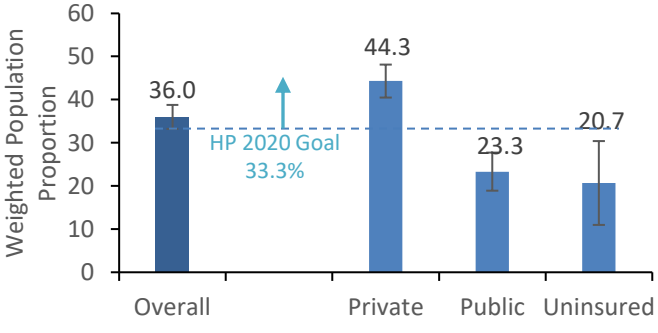


Figure 14. Prevalence of women aged 18-44 years with a recent live birth who self-reported prepregnancy multivitamin or prenatal vitamin use[a] by type of health insurance (MI PRAMS, 2018)



Key Points

The prevalence of folic acid supplementation significantly lower than the HP 2020 Goal among:

- Women aged 18-24 years
- Black women
- Women with high school or lower educational attainment
- Women with a household income <$25,000/year
- Women who are uninsured or on public insurance

[a] Consumption of a multivitamin or prenatal vitamin daily for one month prior to conception. This is an estimation of folic acid intake.

Nutrition and Physical Activity

Overweight and Obesity

In the past 20 years, the prevalence of obesity in pregnant women and women of reproductive age has increased in many high-income countries.[13] Maternal overweight has been associated with increased risk of cesarean section and postoperative complications for those deliveries, gestational diabetes, and hypertension.[14] Infants of overweight mothers are more likely to be admitted to neonatal intensive care units compared to infants of normal-weight mothers.[14] In women with obesity, stillbirth is nearly twice as likely compared to normal-weight women.[13] Maternal obesity has been associated with numerous other poor perinatal outcomes, including preterm delivery, cesarean section, heart defects, neural tube defects, macrosomia (excessive birth weight), low Apgar scores, maternal mortality, gestational diabetes, hypertension and preeclampsia, and thromboembolic disease.[1,13,14] These risks can be reduced by maintaining a healthy weight, improving nutrition and increasing physical activity in the preconception period.[1]

Key Points (MI PRAMS, 2018)

Over 56 percent of Michigan women aged 18-44 years with a recent live birth were classified as either overweight[a] (26.3 percent) or obese[b] (30.5 percent) at the time they became pregnant.

Preconception Health Indicator

Percentage of women aged 18-44 years with a Body Mass Index (BMI; weight in kg/height in m^2) ≥ 25 but < 30 (overweight) or BMI ≥ 30 (obese).

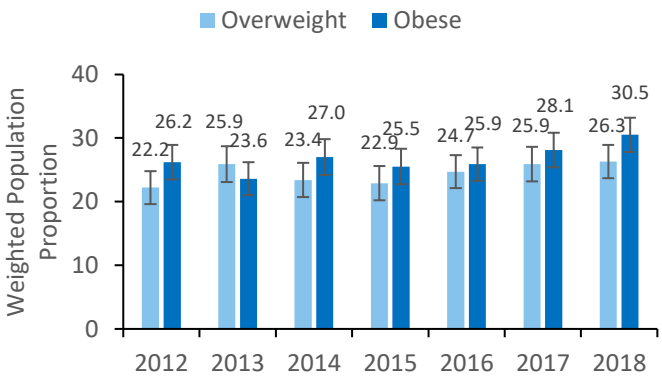
Healthy People 2020 Goals

Reduce the proportion of adults who are obese to 30.6 percent.

Trends Over Time

Prevalence of prenatal overweight and obesity has been constant over the years of 2012-2018, and obesity has achieved (remained below) the HP 2020 Goal.

Figure 15. Prevalence of women aged 18-44 years with a recent live birth who were overweight[a] or obese[b] at the time they became pregnant by year (MI PRAMS, 2012-2018)



[a]25≤BMI<30 based on self-reported height and weight
[b]BMI ≥ 30 based on self-reported height and weight

Nutrition and Physical Activity

Overweight and Obesity

Figure 16. Prevalence of women aged 18-44 years with a recent live birth who were overweight[a] or obese[b] at the time they became pregnant by age (MI PRAMS, 2018)

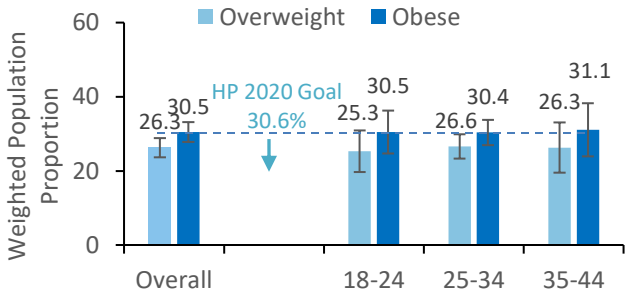


Figure 17. Prevalence of women aged 18-44 years with a recent live birth who were overweight[a] or obese[b] at the time they became pregnant by race (MI PRAMS, 2018)

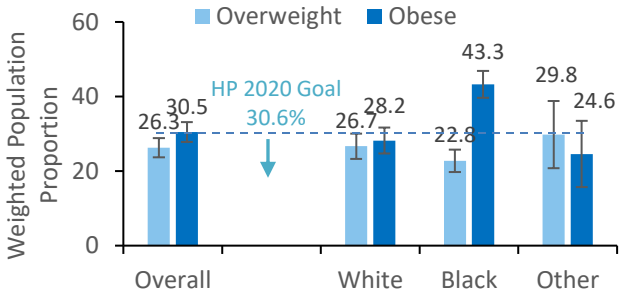


Figure 18. Prevalence of women aged 18-44 years with a recent live birth who were overweight[a] or obese[b] at the time they became pregnant by education (MI PRAMS, 2018)

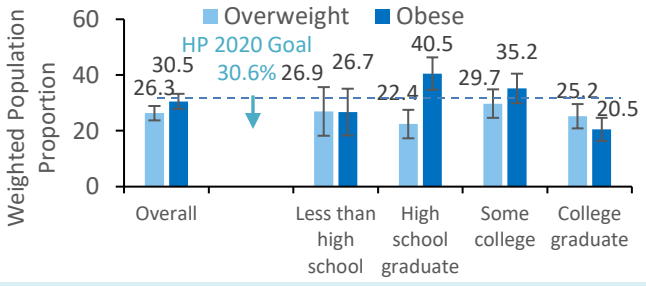


Figure 19. Prevalence of women aged 18-44 years with a recent live birth who were overweight[a] or obese[b] at the time they became pregnant by household income (MI PRAMS, 2018)

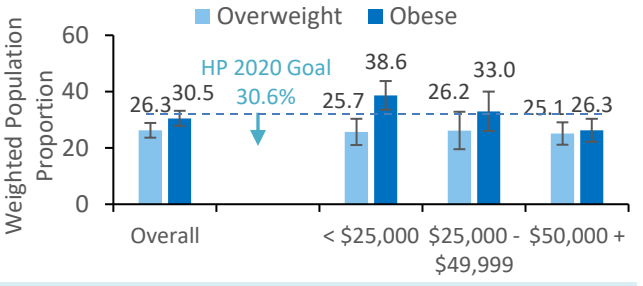
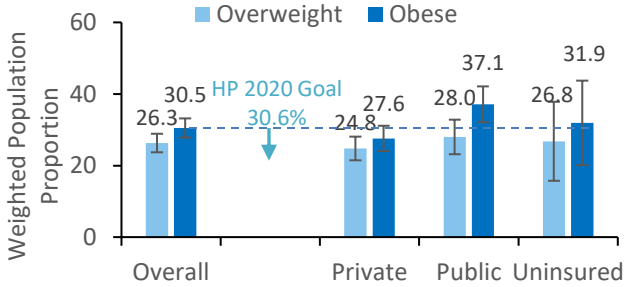


Figure 20. Prevalence of women aged 18-44 years with a recent live birth who were overweight[a] or obese[b] at the time they became pregnant by type of health insurance (MI PRAMS, 2018)



Key Points

The prevalence of obesity significantly exceeded the HP 2020 Goal among:

- Black women
- Women with high school educational attainment
- Women with a household income <$25,000/year
- Women with public insurance

[a]25≤BMI<30 based on self-reported height and weight
[b]BMI ≥ 30 based on self-reported height and weight

Nutrition and Physical Activity

Exercise and Physical Activity

Physical activity can help individuals maintain a healthy weight and can also impact several health outcomes. It can help lower blood pressure, reduce the risk for heart attack, stroke, type 2 diabetes, several forms of cancer, and osteoporosis, and reduce symptoms of depression and anxiety.[15] Physical activity during the preconception period has been associated with decreased risk of gestational diabetes.[16,17,18] Gestational diabetes has been associated with a predisposition to postpartum type 2 diabetes in mothers.[16] Additionally, gestational diabetes and glucose intolerance during pregnancy can increase risk of cesarean section, childhood obesity, and diabetes in children and young adults.[17,18]

Healthy People 2020 Goals

Increase the proportion of adults who engage in aerobic physical activity of at least moderate intensity for 150+ minutes per week, or 75+ minutes per week of vigorous intensity, or an equivalent combination, and also participate in muscle strengthening activities on two or more days per week, to 20.1 percent.

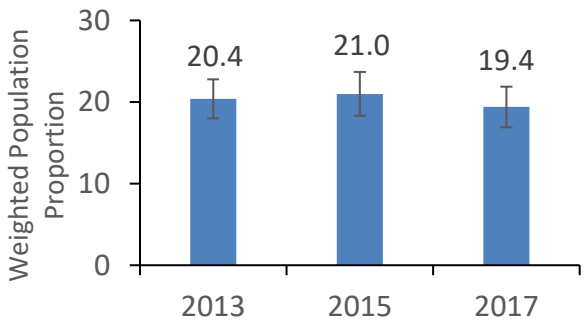
Preconception Health Indicator

Among women aged 18-44 years who participate in leisure-time physical activity, the percentage who engage in either moderate physical activity for 150+ minutes per week or vigorous physical activity for 75+ minutes per week, or an equivalent combination of the two, and muscle strengthening activities on two or more days per week.

Trends Over Time

Prevalence of adequate physical activity has been constant over the years of 2013-2017 and has not achieved (remained below) the HP 2020 Goal in 2017.

Figure 21. Prevalence of women aged 18-44 years who participated in adequate aerobic physical activity[a] by year (MI BRFSS, 2013, 2015, and 2017)



[a]Either moderate physical activity for 150+ minutes per week or vigorous physical activity for 75+ minutes per week, or an equivalent combination of the two, and muscle strengthening activities on two or more days per week (of those reporting leisure physical activity)

Nutrition and Physical Activity

Exercise and Physical Activity

Figure 22. Prevalence of women aged 18-44 years who participated in adequate aerobic physical activity[a] by age (MI BRFSS, 2017)

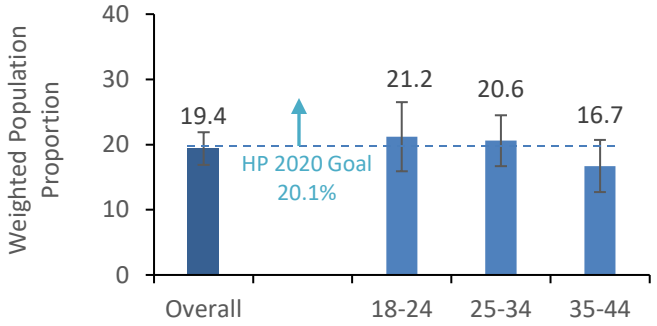


Figure 23. Prevalence of women aged 18-44 years who participated in adequate aerobic physical activity[a] by race (MI BRFSS, 2017)

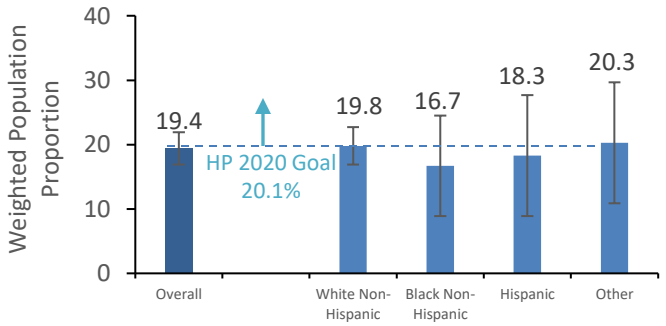


Figure 24. Prevalence of women aged 18-44 years who participated in adequate aerobic physical activity[a] by education (MI BRFSS, 2017)

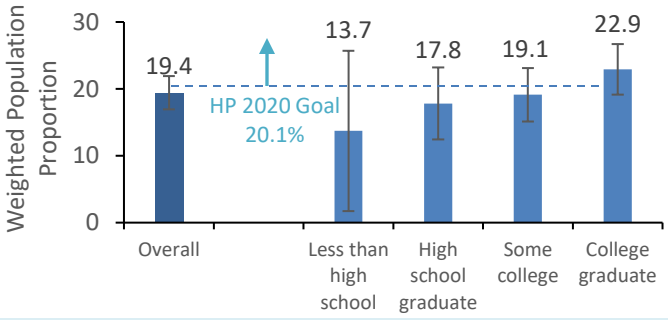


Figure 25. Prevalence of women aged 18-44 years who participated in adequate aerobic physical activity[a] by household income (MI BRFSS, 2017)

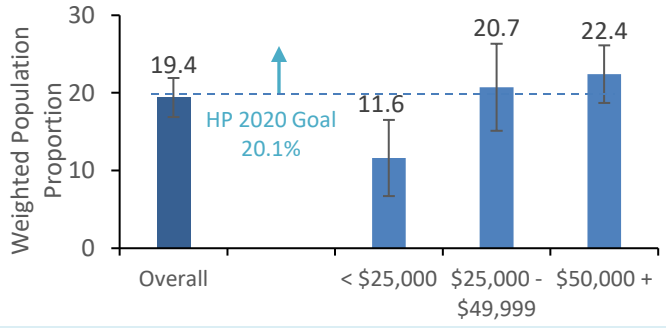
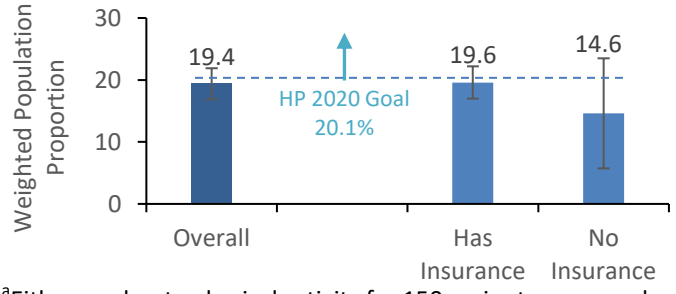


Figure 26. Prevalence of women aged 18-44 years who participated in adequate aerobic physical activity[a] by type of health insurance (MI BRFSS, 2017)



Key Points

The prevalence of adequate physical activity was significantly lower than the HP 2020 Goal among:

- Women aged 35-44 years
- Black non-Hispanic women
- Women with less than high school educational attainment
- Women with a household income <$25,000/year
- Women who are uninsured

[a]Either moderate physical activity for 150+ minutes per week or vigorous physical activity for 75+ minutes per week, or an equivalent combination of the two, and muscle strengthening activities on two or more days per week (of those reporting leisure physical activity)

Nutrition and Physical Activity

Data Sources

Michigan Pregnancy Risk Assessment Monitoring System (MI-PRAMS)

PRAMS is a joint effort of the CDC and state health departments and is available in 47 states, two territories, and New York City. It is a mailed questionnaire sent to a stratified, random sample of women selected 2-3 months after a live birth, gathering data on maternal attitudes, experiences, health behaviors and conditions, and health care access. Telephone follow-up is conducted for women who do not respond by mail. Data are cross-sectional, self-reported, and subject to recall bias. However, yearly findings can be applied to 98 percent of residents who deliver a live singleton, twin, or triplet birth in Michigan.[19]

Michigan Behavior Risk Factor Surveillance System (MI-BRFSS)

BRFSS is a joint effort of the CDC and state health departments and is available in all 50 states. It is a telephone health survey of adults aged 18 years and older, who are selected by random-digit dialing. BRFSS methodology recently changed to include cell phone only respondents. BRFSS serves as a data source regarding health risk behaviors, preventive health practices, and health care access. Data are all self-reported, so this surveillance method is subject to recall bias as people may not remember previous behaviors or health conditions. However, BRFSS is regarded as having moderate to high validity (accuracy). [20]

Suggested Citation

Tian Y, Haak P, Murad A, Fussman C. (2020). Michigan Department of Health and Human Services. Preconception Health in Michigan: Nutrition and Physical Activity.

Nutrition and Physical Activity

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