

The Michigan Monitor

Following trends, promoting prevention
and linking families to resources

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Points of Interest

- * In Michigan during 2008, about 27% of women who had a baby were obese before becoming pregnant.
- * Prepregnancy obesity can increase the risk for adverse birth outcomes such as birth defects or neonatal death.
- * Women who are overweight or obese before becoming pregnant are more likely to gain more weight than recommended during pregnancy.

Obesity in Michigan

Being overweight or obese may increase the risk of developing chronic diseases. For pregnant women, it may also increase the risk of pregnancy and delivery complications and adverse birth outcomes such as birth defects



or neonatal death. The percentage of people who are overweight (BMI=25.0 to 29.9) or obese (BMI > 29.9)

has increased in the United States overall, and in Michigan. In Michigan, the percentage of people who were obese increased from 22.4% in 2000 to 29.5% in 2008.¹

This issue of the *Michigan Monitor* focuses on maternal obesity and the prevalence of selected birth defects by maternal body mass index (BMI). The issue also takes a look at recommended weight gain during pregnancy.

Maternal Obesity

Obesity is not only a risk factor for several chronic diseases, such as hypertension, cardiovascular disease, and diabetes, but prepregnancy obesity can also cause adverse birth outcomes such as birth defects, large-for-gestational age infants, and even fetal and neonatal death.² Being overweight or obese may increase a person's risk for having diabetes mellitus which is also associated with adverse birth outcomes.³

BMI Weight Classifications⁴:

- BMI <18.5: Underweight
- BMI = 18.5 to 24.9: Normal
- BMI = 25.0 to 29.9: Overweight
- BMI >29.9: Obese

Weight classifications are based on body mass index (BMI) which is calculated based on weight and height (BMI=weight [kg] / height [m]). Insight concerning the impact of obesity on Michigan women of childbearing age comes from the Michigan Pregnancy Risk Assessment Monitoring System (PRAMS), a population-based survey of resident

postpartum mothers who delivered a live-born infant. Per responses to the 2008 PRAMS Survey, a total of 27.3% of women had a prepregnancy BMI classified as obese. The percent of women with prepregnancy obesity by race was as follows: 25.2% of white, non-Hispanic (NH) women; 35.3% of black, NH women; 24.0% of another race, NH women; and 30.5% of Hispanic women. The Centers for Disease Control and Prevention (CDC) encourages all women to maintain a healthy weight before becoming pregnant to prevent adverse birth outcomes.

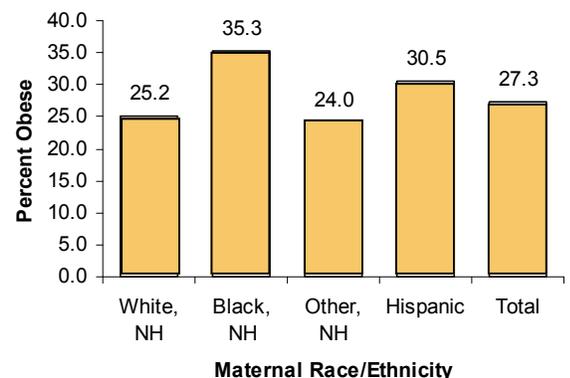


Figure 1. The prevalence of prepregnancy obesity by maternal race/ethnicity reported by women: MI PRAMS, 2008.⁵

Birth Defects and Maternal BMI

Mothers who are *overweight* or *obese* before becoming pregnant may be more likely to have a child with a birth defect, such as a neural tube defect.⁷ Moreover, mothers who are *underweight* before pregnancy may be more likely to have a baby who is born premature, have a low birth weight, or may have a birth defect, such as gastroschisis.^{8,9}

Figure 2 shows the prevalence of birth defects by prepregnancy BMI classification among infants born in Michigan in 2008. MBDR data reveal that birth defects were more prevalent among children born to women who were underweight or obese, compared to those who were normal or overweight before pregnancy. The prevalence of birth defects was 800 cases per 10,000 live births among children born to mothers who were underweight or obese before pregnancy, while the prevalence of birth defects was 715 cases per 10,000 live births among children born to women who were normal or overweight before pregnancy.

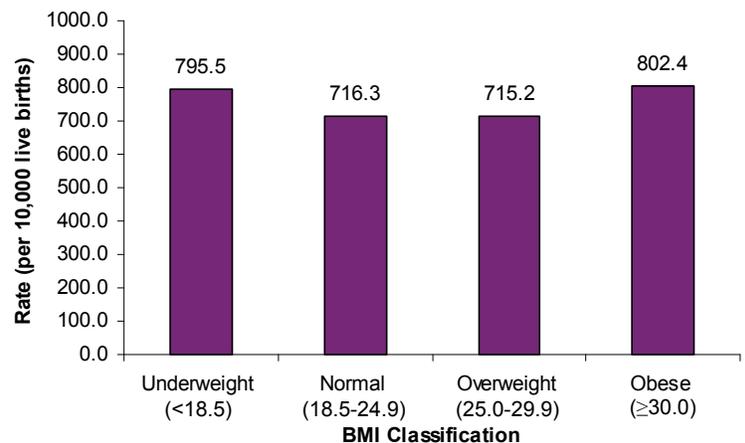


Figure 2: Prevalence of any type of birth defect by prepregnancy BMI classification: MBDR Data, 2008.⁶

Table 1: Prevalence of selected birth defects by prepregnancy BMI classification: MBDR Data, 2008.⁶

Birth Defect	BMI Category	Race/Ethnicity [†]			
		White	Black	Other	Hispanic
CNS	normal	27.2	38.3	38.9	31.2
	overweight/obese	31.0	29.5	72.1	48.1
Heart	normal	137.2	166.2	151.9	113.6
	overweight/obese	161.6	202.3	209.1	174.1
Musculo-skeletal	normal	130.9	143.2	95.4	113.6
	overweight/obese	125.5	125.6	180.2	112.2
Chromo-somal	normal	18.7	10.2	21.1	25.6
	overweight/obese	23.9	21.9	*	25.2
Any Defect	normal	615.3	1185.0	674.7	519.7
	overweight/obese	630.7	1164.7	930.1	597.8

Prevalence expressed as cases per 10,000 live births.

(*) indicates <6 cases.

[†] Race categories may include those of any ethnicity.

Table 1 shows the prevalence of selected birth defects (central nervous system [CNS], heart, musculoskeletal, and chromosomal defects), as well as any defect overall, by maternal race/ethnicity and by BMI category (normal vs overweight or obese). MBDR data reveal that some types of birth defects are more prevalent in children born to women who are overweight or obese, compared to women with a normal BMI (Table 1). Prevalence of birth defects by maternal BMI should be further explored controlling for factors such as maternal diabetes, maternal age, prematurity, and other risk factors for birth defects, which would allow for a more accurate estimate of the effect of maternal obesity on birth defects.

Recommended Weight Gain During Pregnancy

One of the Healthy People 2020 objectives is to increase the proportion of women who achieve the recommended weight gain during pregnancy.¹⁰ Table 2 shows the percent of women who fell below, above, or at the recommended weight gain during pregnancy (based on Institute of Medicine recommendations) by prepregnancy BMI. In Michigan, about one in three women is meeting this recommendation. Previous research has shown that women who are overweight or obese are more likely to gain *more than* the recommended weight and are more likely to keep gained weight after pregnancy.¹¹ Likewise in Michigan, 63.2% of those who were overweight and 56.7% of those who were obese before becoming pregnant gained *above* the recommended weight (Table 3). Only 24% of those who were overweight or obese before pregnancy gained the *recommended* amount of weight during pregnancy (Table 3). This compares to 40.6% of women gaining above the recommended weight in those who were normal weight before pregnancy and only 25.5% gaining above the recommended weight in those who were underweight before pregnancy and (Table 3).

Table 2: Recommendations for weight gain during pregnancy by prepregnancy BMI classification Data, 2008.¹²

Maternal Pre-pregnancy BMI Classification	Recommended Total Weight Gain During Pregnancy (lbs)
Underweight	28-40
Normal	25-35
Overweight	15-25
Obese	15

Table 3: Weight gain during pregnancy by prepregnancy BMI classification: Michigan Vital Records, 2008.¹³

Maternal Pre-pregnancy BMI Classification	Number Singleton Live Births	Recommended Maternal Weight Gain		
		% Below	% Recommended	% Above
Underweight	4136	30.6	42.9	25.5
Normal	52672	22.4	36.4	40.6
Overweight	28298	11.5	24.8	63.2
Obese	26932	19.4	23.2	56.7
Total	112038	19.2	30.6	49.6



Public Health Implications

One of the Healthy People 2020 objectives is to increase the proportion of women with a healthy weight prior to pregnancy.¹⁰ Prepregnancy obesity may be a risk factor for pregnancy and delivery complications as well as for some birth defects and other adverse birth outcomes such as large-for-gestational age, and fetal or neonatal death. Women who are planning on becoming pregnant are encouraged to maintain or work towards a healthy weight to help prevent adverse birth outcomes. Health care providers should encourage all women of childbearing age to have a healthy diet, including 400 micrograms of folic acid daily, and should screen women for diabetes and hypertension which are often associated with obesity and may also be a risk factor for some birth defects.^{3,14} Women should be encouraged to achieve the recommended weight during pregnancy and should return to a healthy weight after becoming pregnant because obesity is a risk factor for many chronic diseases such as cardiovascular disease, diabetes, and stroke. Reducing obesity in Michigan is one of Governor Snyder's top priorities, as seen in the *Michigan Dashboard*, measuring Michigan's success with selected performance indicators. More information on the *Dashboard* can be found at: <http://www.michigan.gov/midashboard/>.

Information and Resources

- For information about obesity in Michigan and about the Michigan Healthy Eating and Physical Activity Strategic Plan see the **Nutrition, Physical Activity and Obesity Program** website at: http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_2959_3208-148846--,00.html
- Find healthy hints for pregnant women about nutrition and other services available in Michigan through the **WIC Program** by going to: <http://www.michigan.gov/wic/>
- Find Michigan's archived 2009 birth defects prevention materials focused on **Obesity Prevention and Weight Management—Before, During and After Pregnancy** at <http://www.migeneticsconnection.org/bdmonth09.shtml>.
- The **Centers for Disease Control and Prevention (CDC)** provides information and tools to support the effort to achieve and keep a healthy weight at <http://www.cdc.gov/healthyweight/index.html>. Find social media resources such as a BMI calculator widget, podcasts and more.
- The **March of Dimes Foundation** (www.marchofdimes.com) has many materials supporting good nutrition and healthy weight during pregnancy. For example, weight gain during pregnancy facts can be found at http://www.marchofdimes.com/Pregnancy/yourbody_weightgain.html.
- The **Organization of Teratogen Information Specialists (OTIS)** maintains a series of fact sheets on pregnancy risk factors. Find exercise facts and more at www.otispregnancy.org.
- For information and resources concerning pregnancy and underweight, including eating disorders and body image, visit the **National Women's Health Information Center** at <http://www.womenshealth.gov/bodyimage/>

For Providers—

Before Pregnancy

- * Inform women about the health risks.
- * Encourage a healthy diet, including 400 micrograms of folic acid daily.
- * Screen for hypertension and diabetes mellitus.
- * Encourage regular exercise.

During Pregnancy

- * Discuss recommended weight gain.

After Pregnancy

- * Counsel to return to a healthy weight.

Box 1: Recommendations for all Women—
March of Dimes Foundation¹⁴



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Program Updates

New Rules for Reporting Birth Defects Approved on April 1, 2011.

In order to accurately characterize the prevalence of certain conditions which are reportable to the Michigan Birth Defects Registry, it is important to include children who may be diagnosed later than two years of age. This issue is increasingly important as more school aged children are being diagnosed with Fetal Alcohol Spectrum Disorder. Work began in 2009 to revise the current rules for reporting, and became part of the law on April 1, 2011. You can see the new rules at the following link: [http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&Admin Num=32509071&Dpt=CH&RngHigh=](http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&AdminNum=32509071&Dpt=CH&RngHigh=)

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