



# Ottawa County Health Department Body Mass Index Survey 2007-2008

## INTRODUCTION

Overweight children are at risk for serious health problems during their childhood. Further, individuals who are overweight as children are significantly more likely to become obese as adults. Documented childhood and adult health risks include cardiovascular disease, type 2 diabetes, asthma, gall bladder disease, sleep apnea, osteoarthritis, some types of cancer, and social discrimination. The prevalence of overweight among 6-11 year olds has increased in the last 25 years from 6.5% (1976-1980) to 18.8% (2003-2004).<sup>1</sup> Numerous factors have been associated with this increase in prevalence including higher energy intake, increased sedentary behavior, and socioeconomic stress. All of these risk factors are in-turn affected by a child's home, school, and community environment. Therefore, interventions to prevent the rise in childhood obesity and promote the health of students must be initiated at the local level.

To assess the prevalence of childhood obesity at the local level and help target interventions, the Ottawa County Health Department initiated a survey of body mass index (BMI) in the local 3<sup>rd</sup> grade population. A stratified cluster sample design was utilized in order to compare the results. The sample included private schools and public schools (see "Methods" for details).

This study was a continuation of previous BMI testing that was collected in 2004-2005 by the Ottawa County Health Department. Results from this study indicated that approximately 15% of children screened were classified as obese and approximately 17% were classified as overweight. A copy of this report can be found at [www.miottawa.org/health](http://www.miottawa.org/health) by following the links to data and statistics.

## RESULTS

Overall, 1106 Ottawa County 3<sup>rd</sup> graders from 18 different schools were assessed for BMI (Table I). A total of 10.6% of the sampled students were classified as obese while an additional 13.5% were classified as overweight (Figure 1 and Table II). Gender was not significantly associated with any of the BMI categories (Figure 1).

## DISCUSSION

### *Findings*

Among Ottawa County 3<sup>rd</sup> graders, 10.6% of students were classified as obese and an additional 13.5% were classified as overweight. The prevalence of obesity in Ottawa County is lower than the national average for 6-11 year olds (18.8% in 2003-2004).

The data collected from the screening assessment is vital in providing insight into the issue of childhood obesity and provide the groundwork necessary for planning prevention interventions around the issue of obesity. The Ottawa County Health Department is involved in several community wide projects geared toward reducing childhood obesity as well as obesity in the adult population. The "Fit For a Kid" project is a multifaceted approach to addressing childhood obesity in Ottawa County. "Fit For a Kid" includes

- a series of educational handouts created for local physicians to give to the patients who are at risk for obesity (Handouts are also available on the County website at [www.miottawa.org/health](http://www.miottawa.org/health).)
- an in-home intervention for families of children ages 0-1 and
- community intervention for families of children ages 2-5.

Other OCHD programs/partnerships geared towards reducing obesity and promoting healthy lifestyles include; the Ottawa County Wellness Coalition (OCWC) and worksite mini grants. The OCWC is working to improve the health of Ottawa County Communities by increasing access to healthy food choices, physical activity, and tobacco-free environments. The Health Department works with local businesses to assess their environment and then draw up a workplan to improve their environment by increasing access to healthy eating and physical exercise. Businesses can apply for worksite mini grants to get these projects started.

## METHODS

### *Sampling*

Stratified cluster sampling was used to randomly select elementary schools for participation in the Ottawa County BMI survey. Ottawa County elementary schools with 3rd graders (n=65) were stratified into three categories: 1) Private schools (n=16) 2) Higher income public schools (n=37) and 3) Lower income public schools (n=12). The income classification of public schools was determined on the basis of free and reduced lunch (FRL) enrollment during the 2005-2006 academic school year.<sup>2</sup> Schools with less than 40% of their students enrolled in the FRL program were classified as higher income schools, and schools with 40% or more of their students enrolled were classified as lower income schools. Schools in each category were then randomized, and invited to participate in the survey.<sup>3</sup> If a school declined to participate, the next school in the randomly generated list was contacted. Lower income schools were oversampled to obtain a more accurate assessment of this at-risk population. Overall, the number of students necessary to obtain an estimate of the obese or overweight population of 3rd graders in Ottawa County was 700 (twice the sample size for a true random sampling strategy).<sup>4</sup>

### *Measurement*

Consent for student participation was passively obtained from parents. All consenting 3rd graders in attendance on the day of a screening were measured for height and weight in a private, participant blinded setting without footwear or large, bulky outer layers. Height and weight measures were obtained in duplicate using a digital scale with attached height rod and casters. After the initial measures, students were told to step off the scale while both instruments were recalibrated. If the second weight measurement differed by more than 0.25 pounds from the initial reading, a third measurement was taken. Similarly, if the second height measurement was more than 0.25 inches different from the first height, a third measurement was taken. Height measurements were recorded by hand to the nearest quarter of an inch while weight measurements were recorded to the nearest tenth of a pound. Additional information recorded included the student's date of birth, the student's gender, and date of measurement. All recorded information was then entered into a Microsoft Access database.

### *Analysis*

Average height and weight were calculated using the two closest measurements. If three measurements were equally spaced, the two lower measurements were used in order to prevent an overestimation of body mass index. Body mass index was calculated using the formula  $BMI = (\text{Weight in kilograms}) / (\text{Height in meters})^2$ . Age and gender specific BMI percentiles were calculated using a SAS program available from the Centers for Disease Control.<sup>5</sup> SAS version 9.1.3 was used to analyze the data. All county-wide estimates were weighted based on the probability of selecting schools in the different strata to adjust for the stratified cluster sampling design. Logistic regression was used to estimate the odds of being overweight after adjusting for gender.

## TABLES AND FIGURES

**Table I:** Characteristics of Students Included in the Assessment

	N	%
<b>Total Students</b>	1106	
<b>Gender</b>		
Male	612	55.3%
Female	494	44.7%

**Table II:** BMI for Gender and Age Categories

Weight Status Category	BMI Percentile Range
Underweight	< 5 <sup>th</sup> percentile
Healthy Weight	5 <sup>th</sup> - < 85 <sup>th</sup> percentile
Overweight	85 <sup>th</sup> - < 95 <sup>th</sup> percentile
Obese	≥ 95 <sup>th</sup> percentile

Figure 1: BMI Category for Ottawa County Third Graders (2007-2008)

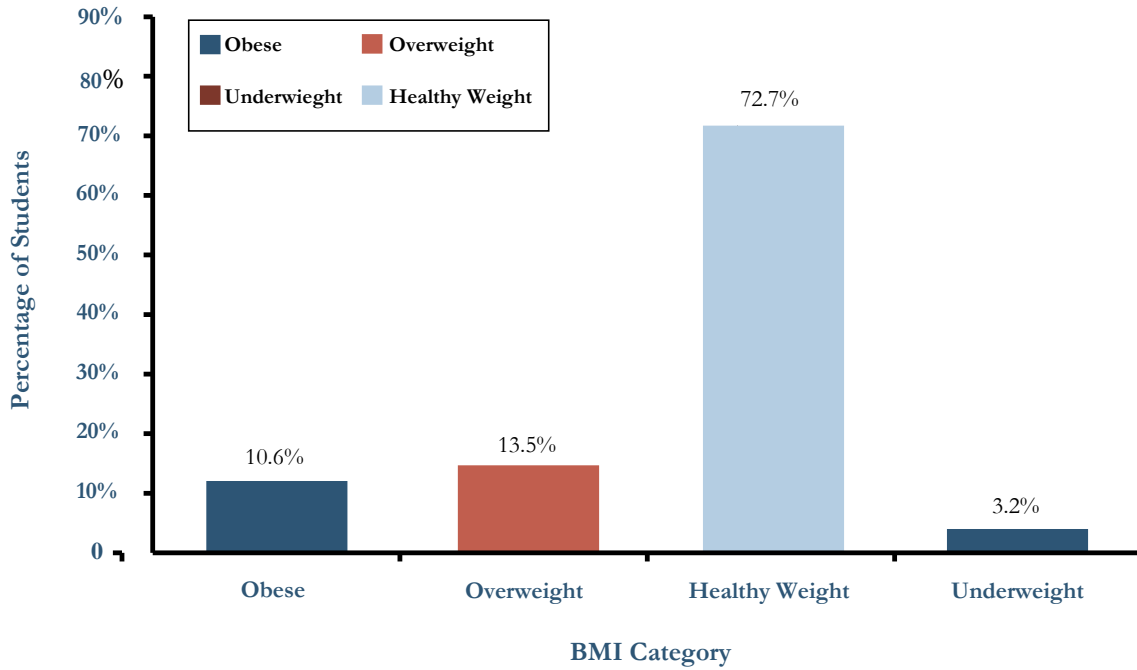
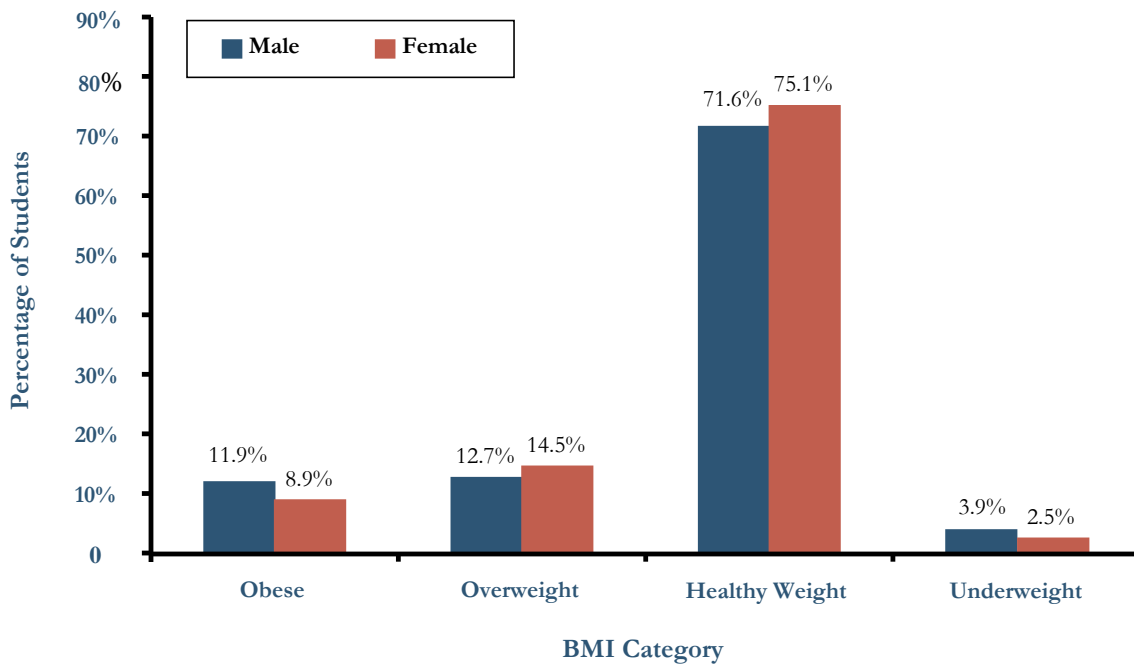


Figure 2: BMI Category by Gender for Ottawa County Third Graders (2007-2008)



## REFERENCES

1. NHANES data on the Prevalence of Overweight Among Children and Adolescents: United States, 2003–2004. CDC National Center for Health Statistics, Health E-Stat. [http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overweight/overwght\\_child\\_03.htm](http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overweight/overwght_child_03.htm)
2. Michigan Center for Education Performance & Information. [http://www.michigan.gov/cepi/0,1607,7-113-21423\\_30451\\_36965-146259--,00.html](http://www.michigan.gov/cepi/0,1607,7-113-21423_30451_36965-146259--,00.html) Accessed July 31<sup>st</sup>, 2007.
3. Random.org. <http://www.random.org/> Accessed July 31<sup>st</sup>, 2007.
4.  $n = x \cdot \left( \frac{z^*}{m} \right)^2 \cdot p(1 - p)$  ----- $z^*=1.96$ ;  $m=0.05$ ;  $p=35\%$ =proportion at risk;  $x=2$ =cluster sample factor.
5. A SAS Program for the CDC Growth Charts. <http://www.cdc.gov/nccdphp/dnpa/growthcharts/resources/sas.htm> Accessed May 5<sup>th</sup>, 2008.

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