

# Overweight and Obesity in Michigan: Surveillance Report Series



## Nutrition Chapter 2009

*Michigan Department  
of Community Health*



Jennifer M. Granholm, Governor  
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Michigan's CDC funded Nutrition, Physical Activity and Obesity Program is in the process of developing the "Overweight and Obesity in Michigan" surveillance report. The report will contain four chapters, Physical Activity, Nutrition, Breastfeeding and Obesity. Each chapter will be released individually with the final report completed and released by the summer of 2009.

The second released chapter, Nutrition, contains surveillance data on Inadequate Fruit and Vegetable Consumption, Fast Food (Adults) and Sugar-Sweetened Beverages (Youth).

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**Introduction:**

The 2005 Dietary Guidelines for Americans<sup>1</sup> published by the U.S. Department of Health and Human Services and the United States Department of Agriculture recommend that adults consume a variety of nutrient-dense foods and beverages within and among the basic food groups. Research shows that healthy eating can contribute to maintaining a healthy weight or losing excess weight. This in turn can help lower people's risk for chronic diseases, including heart disease, stroke, some cancers, diabetes, and osteoporosis. However, a large gap remains between healthy dietary patterns and what Americans actually eat.<sup>1</sup>

Substituting foods relatively high in water and fiber (low energy dense) for foods high in carbohydrates, fat, protein or alcohol (high energy dense) will tend to help a person feel full while consuming fewer calories. Most fruits and vegetables have a lower energy density than foods from other food groups.<sup>2</sup>

It is estimated that each year in the United States more than \$33 billion in direct medical costs and \$9 billion in lost productivity resulting from heart disease, stroke, cancer and diabetes are attributed to poor eating habits. Healthy foods does not have to be expensive when it is available. One study showed that consumers could get three servings of fruits and four servings of vegetables daily for an average cost of 64 cents per day (in 1999 dollars).<sup>3</sup>

**Key Findings:***Adults*

- In 2008, 78.3% of Michigan adults consumed inadequate fruits and vegetables.
- Inadequate fruit and vegetable consumption decreased with increasing education. Females (26.6%) were more likely to get an adequate amount than males (16.0%).
- Nearly 1 in 4 Michigan adults went to a fast food restaurant two or more times a week in 2005.

*Youth*

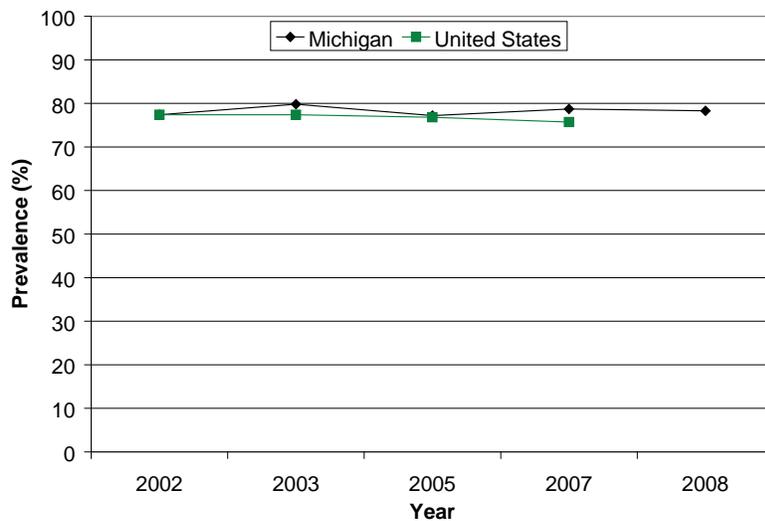
- In 2007, 83.0% of Michigan youth consumed inadequate fruits and vegetables.
- There were no significant differences by race or gender.
- Almost 30% of youth drank at least one non-diet pop or soda a day. There was a significant difference in soda consumption between males (34.6%) and females (23.1%).

### Adults

The 2005 Dietary Guidelines for Americans<sup>1</sup> recommend that adults eat between 1.5 to 2.5 cups of fruit daily and 2.5 to 4 cups of vegetables daily, depending on age, gender, and amount of regular physical activity, see Appendix A. Within a week, adults are advised to choose options from all five of the vegetable subgroups (dark green, orange, legumes, starchy and other vegetables). Eating a diet high in fruits and vegetables is associated with lowering your risk of developing diseases such as cancer.<sup>2</sup>

Although the 2005 guidelines recommend 4 to 6.5 cups of fruit and vegetables per day, data is still collected based on the *Healthy People 2010* goals.<sup>4</sup> These goals state that adults should get two servings of fruit and three servings of vegetables per day for a total of five servings.

Figure 1. Prevalence of inadequate fruit and vegetable consumption\* among adults, 18 years and over in Michigan and United States, 2002 to 2008.

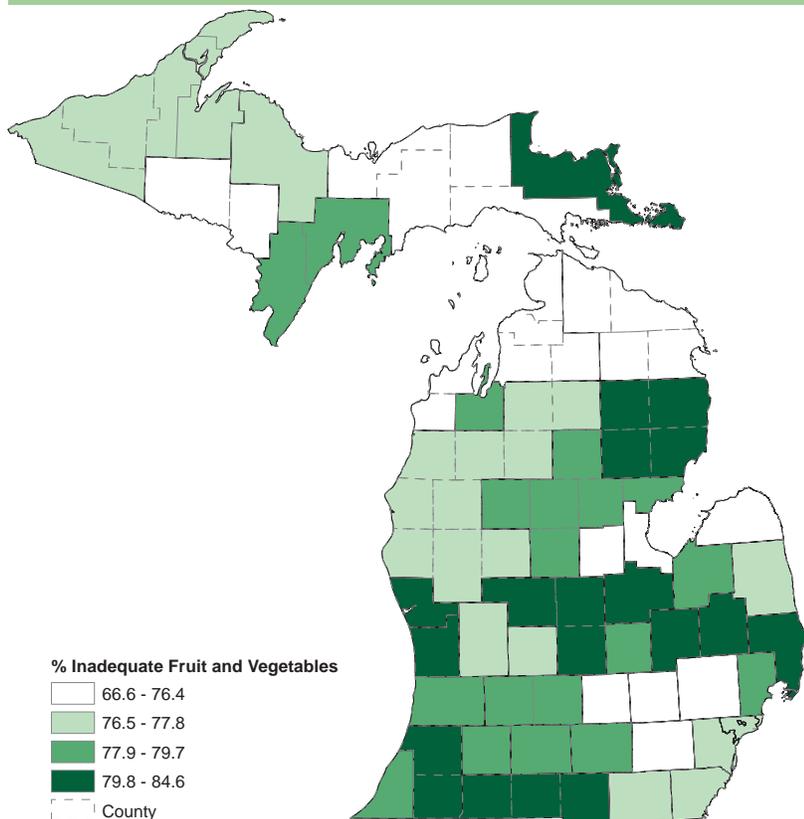


Sources: Michigan Behavioral Risk Factor Survey (BRFS) and CDC Behavioral Risk Factor Surveillance System.

\*The proportion whose total reported consumption of fruits (including juice) and vegetables was less than five times per day (The national BRFS did not include this question in 2008).

- In 2008, the prevalence of inadequate fruit and vegetable consumption was 78.3% among Michigan adults.
- Females (73.4%) had a lower prevalence of inadequate fruit and vegetable consumption than males (84.0%).
- Consumption of fruits and vegetables did not differ by race or household income.
- Adults who were high school graduates (83.8%) had a higher prevalence of inadequate fruit and vegetable consumption compared with adults with a college education (73.5%).

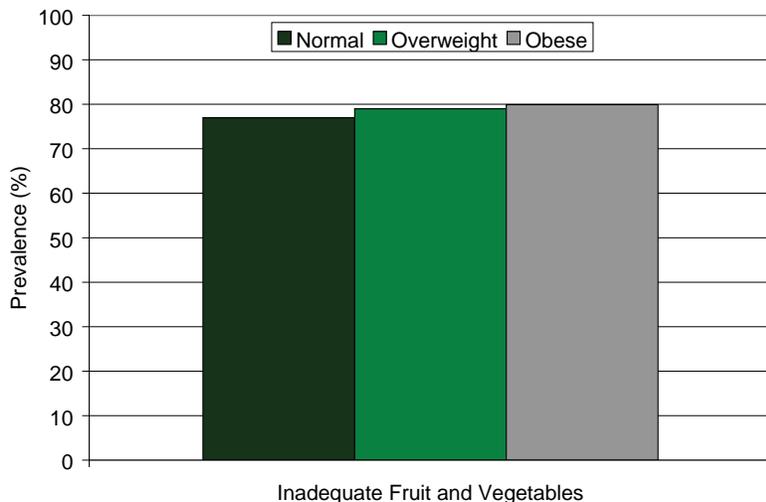
Map 1. Prevalence of inadequate fruit and vegetable consumption\* among adults 18 and over in Michigan by local health department jurisdiction, 2005 to 2007.



Source: Michigan Behavioral Risk Factor Survey (BRFS)  
 \*The proportion whose total reported consumption of fruits (including juice) and vegetables was less than five times per day.

- The prevalence of inadequate fruit and vegetable consumption in Michigan from 2005 to 2007 was 77.8%.
- More than 75% of adults in 38 of the 45 local health department areas reported inadequate fruit and vegetable consumption.
- Muskegon Local Health Department had the highest reported inadequate fruit and vegetable intake (84.6%) and Benzie-Leelanau Local Health Department had the lowest (66.6%). This difference is not significant.
- See Appendix C for a list of all the health department areas and their corresponding prevalences.

Figure 2. Prevalence of inadequate fruit and vegetable consumption among, adults 18 and over, by weight status in Michigan, 2008.



Source: Michigan Behavioral Risk Factor Survey (BRFS)

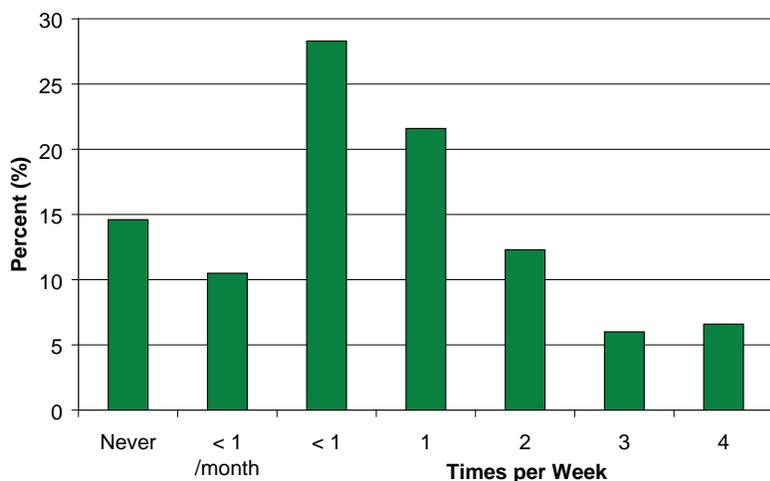
- In 2008, Michigan adults who were obese reported a slightly higher prevalence of inadequate fruit and vegetable consumption (79.9%) compared with adults that reported a BMI that was normal (77.0%) or overweight (79.0%). These differences, however, were not statistically significant.

**Fast Food**

The consumption of fast food, a recent trend in the American lifestyle, is a suggested contributor to the rise in obesity.<sup>5</sup> Meals consumed away from home tend to be low in fruits and vegetables, generously portioned, served in combination packages, and offered with sugar-sweetened beverages. It stands to reason that today, eating away from home can make it difficult to follow the current evidence-based dietary advice. See Appendix G for the survey question used in this analysis.

The proportion of all food expenditures that represent meals consumed out of the home has increased from 25% in 1957 to 49% in 2007. Of the meals and snacks consumed out of the home the proportion of sales that were from fast food restaurants increased from 5% in 1958 to 37% in 2007.<sup>3</sup>

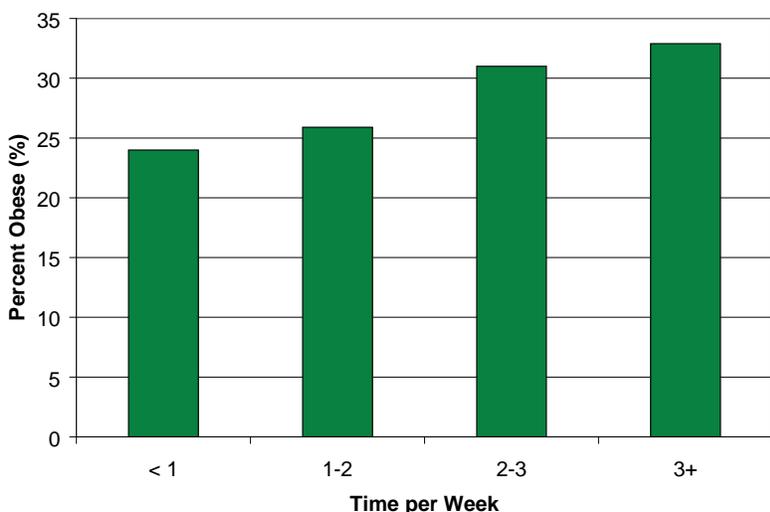
Figure 3. Prevalence of fast food consumption among adults, 18 and over, in Michigan, 2005.



Sources: Michigan Behavioral Risk Factor Survey (BRFS).

- In 2005, nearly one-in-four (24.9%) Michigan adults went to a fast food restaurant two or more times a week.
- The prevalence of fast food consumption for males (30.4%) was higher than for females (20.0%) and blacks (30.3%) was higher than whites (23.9%).
- There were no differences by education but prevalence did decrease with age from 36.5% of 18 to 24 year-olds to 11.3% of those aged 65 and older.

Figure 4. Prevalence of obesity by frequency of fast food consumption among adults, 18 and over, in Michigan, 2005.



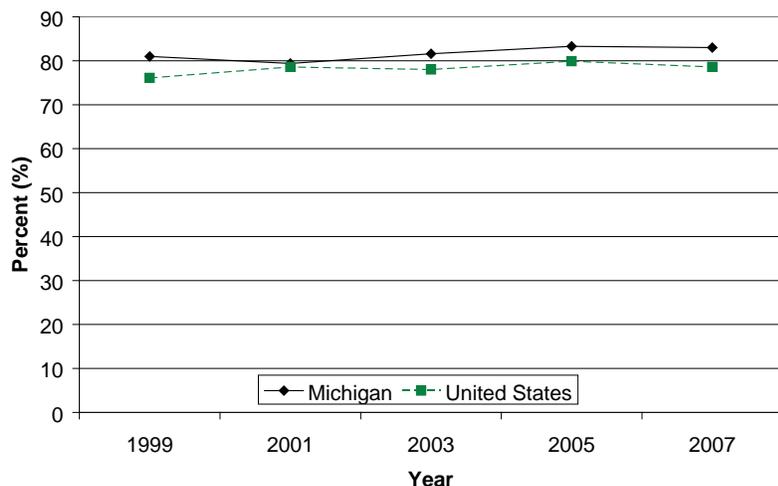
Sources: Michigan Behavioral Risk Factor Survey (BRFS).

- The prevalence of obesity increased with increased number of visits to fast food restaurants in a week from less than once a week (24.0%) to more than three visits a week (32.9%).
- The odds of being obese were about 60% greater for those eating fast food two or more times a week compared to those consuming it less frequently.
- The most frequent reason people reported going to a fast food restaurant was speed and convenience (62.7%).

**Youth**

The 2005 Dietary Guidelines for Americans<sup>1</sup> recommend that children, ages 2 to 18 years, eat between 1 to 2.5 cups of fruit daily and 1 to 4 cups of vegetables daily, depending on calorie needs, see Appendix A. These recommendations also encourage children to consume 2 to 3 cups of fat-free or low-fat milk products a day.

Figure 5. Prevalence of inadequate fruit and vegetable consumption\* among youth, grades 9 through 12, in Michigan and United States, 1999 to 2007.



Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

\*Percentage of students who ate fruits and vegetables (excluding french fries, fried potatoes and potato chips) less than five times per day.

- In the past nine years, the prevalence of Michigan youth that haven't met the minimum recommendations for fruits and vegetables fluctuated from 81.0% in 1999 to 83.0% in 2007.
- In 2007, prevalence of inadequate fruit and vegetable consumption among Michigan youth was similar among blacks (78.3%), Hispanics (82.1%) and whites (83.9%).
- The prevalence for females (83.6%) and males (82.3%) were very similar in Michigan, 2007.

Figure 6. Prevalence of youth, grades 9 through 12, who consumed the following items one or more times per day in Michigan and United States, 2007.

| Measure                  | Prevalence (%) Michigan | Prevalence (%) U.S. |
|--------------------------|-------------------------|---------------------|
| Fruit                    | 84.3                    | 85.3                |
| Green Salad              | 64.7                    | 64.1                |
| Potatoes                 | 71.4                    | 69.1                |
| Carrots                  | 48.3                    | 46.3                |
| Other Vegetables         | 82.2                    | 82.4                |
| Milk (3 or more glasses) | 14.5                    | 14.1                |

Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

- In 2007, the prevalence of white youth who consumed the following: fruit, green salad, potatoes, carrots, other vegetables and milk was significantly higher than black youth. However, white youth (16.1%) had a similar prevalence as black youth (21.7%) for eating five or more servings of fruits and vegetables per day.
- Michigan's prevalence was similar to the United States for all of the items in the table.

### Sugar-Sweetened Beverages

Sugars can be found naturally in nutrient dense foods such as fruit or milk. Sugars can also be added to beverages such as soda, however, soda provides calories but few or no nutrients. The more sugar-sweetened beverages a person consumes, the more likely he or she is to be overweight.<sup>6</sup>

Figure 7. Prevalence of youth, grades 9 through 12, that drank soda or pop\* one or more times per day in the past week in Michigan and United States, 2007.

| Measure  | Prevalence (%)<br>Michigan | Prevalence (%)<br>U.S. |
|----------|----------------------------|------------------------|
| Total    | 28.9                       | 33.8                   |
| Male     | 34.6                       | 38.6                   |
| Female   | 23.1                       | 29.0                   |
| Black    | 25.8                       | 37.6                   |
| White    | 29.9                       | 34.0                   |
| Hispanic | 27.2                       | 33.4                   |

\* Percentage of students who drank a can, bottle, or glass of soda or pop (not including diet soda or diet pop) at least one time per day during the seven days before the survey.  
Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

- In 2007, the prevalence of Michigan youth that drank at least one pop per day (28.9%) was lower than the United States youth (33.8%) prevalence.
- There was a statistically significant difference between prevalence of male (34.6%) and female (23.1%) soda or pop drinkers in Michigan.
- The racial pattern between Michigan and the United States for soda consumption is different.

### *Table of Appendices*

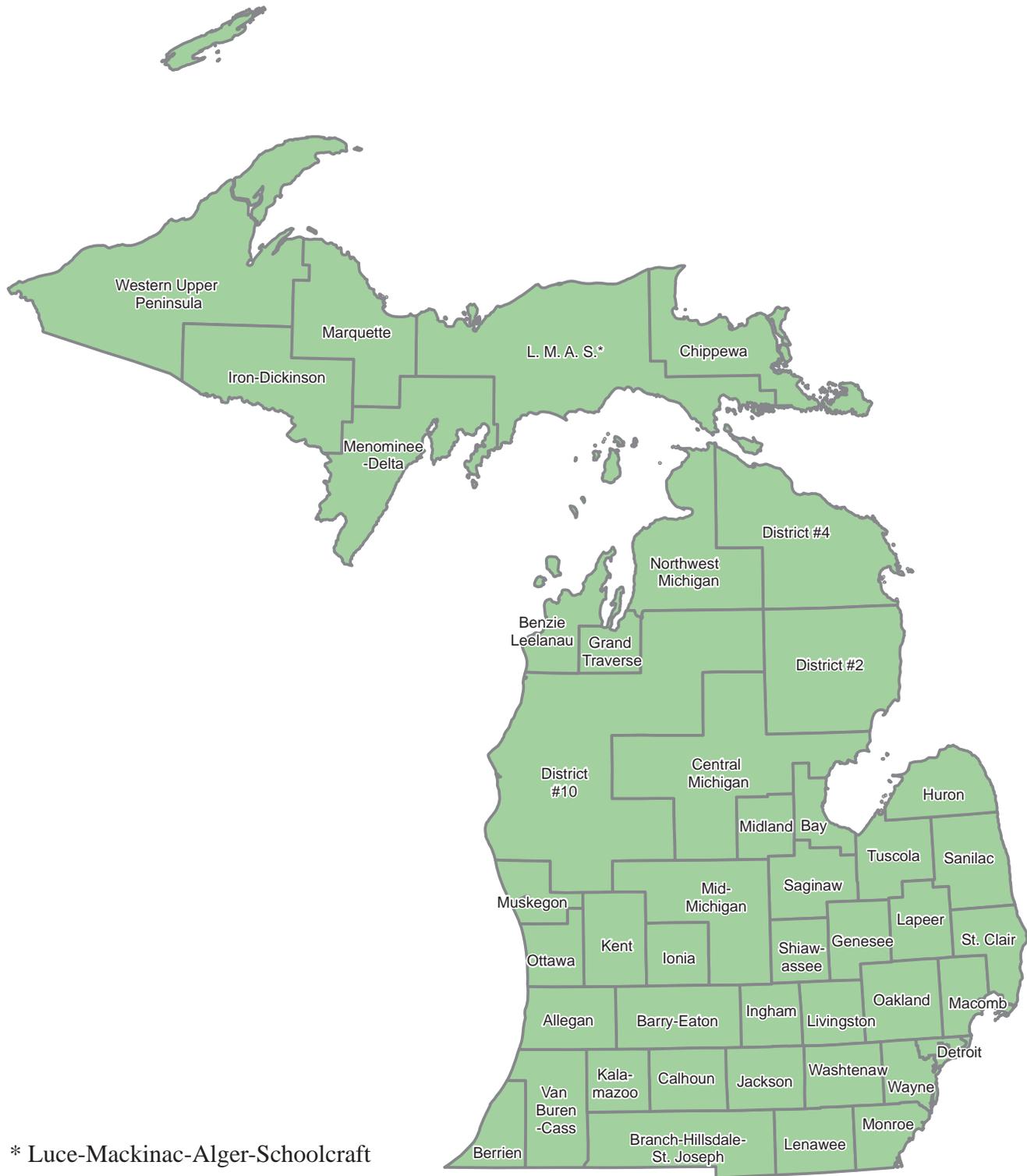
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**Appendix A:** Fruit and vegetable recommendations by age, gender and activity level.

| <b>Females</b>           | <b>Age</b> | <b>Fruits</b> | <b>Vegetables</b> | <b>Males</b>             | <b>Age</b> | <b>Fruits</b> | <b>Vegetables</b> |
|--------------------------|------------|---------------|-------------------|--------------------------|------------|---------------|-------------------|
| <b>Less Active</b>       | 2-3        | 1 cup         | 1 cup             | <b>Less Active</b>       | 2-3        | 1 cup         | 1 cup             |
|                          | 4-8        | 1 cup         | 1.5 cups          |                          | 4-8        | 1.5 cups      | 1.5 cups          |
|                          | 9-13       | 1.5 cups      | 2 cups            |                          | 9-13       | 1.5 cups      | 2.5 cups          |
|                          | 14-18      | 1.5 cups      | 2.5 cups          |                          | 14-18      | 2 cups        | 3 cups            |
|                          | 19-30      | 2 cups        | 2.5 cups          |                          | 19-30      | 2 cups        | 3 cups            |
|                          | 31-50      | 1.5 cups      | 2.5 cups          |                          | 31-50      | 2 cups        | 3 cups            |
|                          | 51+        | 1.5 cups      | 2 cups            |                          | 51+        | 2 cups        | 2.5 cups          |
| <b>Moderately Active</b> | 2-3        | 1 cup         | 1 cup             | <b>Moderately Active</b> | 2-3        | 1 cup         | 1 cup             |
|                          | 4-8        | 1.5 cups      | 1.5 cups          |                          | 4-8        | 1.5 cups      | 1.5 cups          |
|                          | 9-13       | 1.5 cups      | 2 cups            |                          | 9-13       | 1.5 cups      | 2.5 cups          |
|                          | 14-18      | 2 cups        | 2.5 cups          |                          | 14-18      | 2 cups        | 3 cups            |
|                          | 19-30      | 2 cups        | 2.5 cups          |                          | 19-30      | 2 cups        | 3 cups            |
|                          | 31-50      | 2 cups        | 2.5 cups          |                          | 31-50      | 2 cups        | 3 cups            |
|                          | 51+        | 1.5 cups      | 2.5 cups          |                          | 51+        | 2 cups        | 2.5 cups          |
| <b>Active</b>            | 2-3        | 1 cup         | 1 cup             | <b>Active</b>            | 2-3        | 1 cup         | 1 cup             |
|                          | 4-8        | 1.5 cups      | 1.5 cups          |                          | 4-8        | 1.5 cups      | 2 cups            |
|                          | 9-13       | 1.5 cups      | 2.5 cups          |                          | 9-13       | 2 cups        | 2.5 cups          |
|                          | 14-18      | 2 cups        | 3 cups            |                          | 14-18      | 2.5 cups      | 3.5 cups          |
|                          | 19-30      | 2 cups        | 3 cups            |                          | 19-30      | 2.5 cups      | 4 cups            |
|                          | 31-50      | 2 cups        | 3 cups            |                          | 31-50      | 2.5 cups      | 3.5 cups          |
|                          | 51+        | 2 cups        | 2.5 cups          |                          | 51+        | 2 cups        | 3 cups            |

Source: Created using CDC More Matters and Dietary Guidelines for Americans

**Appendix B:** The Local Health Department Jurisdictions in Michigan.



\* Luce-Mackinac-Alger-Schoolcraft

**Appendix C:** Prevalence rates for Michigan adults who do not meet the recommendations for fruit and vegetable consumption, 2005 to 2007.

| Local Health Department Jurisdictions  | Inadequate Fruit and Vegetables |
|--|---------------------------------|
| Allegan                                | 78.5                            |
| Barry-Eaton                            | 78.0                            |
| Bay                                    | 76.4                            |
| Benzie-Leelanau                        | 66.6                            |
| Berrien                                | 78.9                            |
| Branch-Hillsdale-St. Joseph            | 81.9                            |
| Calhoun                                | 78.1                            |
| Central Michigan                       | 79.7                            |
| Chippewa                               | 83.7                            |
| City of Detroit                        | 77.2                            |
| District #10                           | 77.8                            |
| District #2                            | 83.8                            |
| District #4                            | 75.8                            |
| Genesee                                | 82.1                            |
| Grand Traverse                         | 78.7                            |
| Huron                                  | 75.2                            |
| Ingham                                 | 71.3                            |
| Ionia                                  | 77.0                            |
| Iron-Dickinson                         | 68.8                            |
| Jackson                                | 78.6                            |
| Kalamazoo                              | 78.3                            |
| Kent                                   | 77.0                            |
| Lapeer                                 | 80.1                            |
| Lenawee                                | 77.8                            |
| Livingston                             | 74.7                            |
| Luce-Mackinac-Alger-Schoolcraft (LMAS) | 71.5                            |
| Macomb                                 | 79.0                            |
| Marquette                              | 76.7                            |
| Menominee-Delta                        | 79.7                            |
| Midland                                | 70.8                            |
| Mid-Michigan                           | 83.4                            |
| Monroe                                 | 76.8                            |
| Muskegon                               | 84.6                            |
| Northwest Michigan                     | 76.2                            |
| Oakland                                | 75.4                            |
| Ottawa                                 | 82.1                            |
| Saginaw                                | 80.4                            |
| Sanilac                                | 77.3                            |
| Shiawassee                             | 78.5                            |
| St. Clair                              | 79.8                            |
| Tuscola                                | 77.9                            |
| Van Buren-Cass                         | 82.0                            |
| Washtenaw                              | 72.7                            |
| Wayne, excluding Detroit               | 77.7                            |
| Western Upper Peninsula                | 76.7                            |

**Appendix D:** *Healthy People 2010* goals related to nutrition.

|  |
|--|
| (Objective 19-5) Increase the proportion of persons aged 2 years and older who consume at least two daily servings of fruit to 75%.  |
| (Objective 19-6) Increase the proportion of persons aged 2 years and older who consume at least three daily servings of vegetables, with at least one-third being dark green or orange vegetables to 50%.                                |
| (Objective 19-7) Increase the proportion of persons aged 2 years and older who consume at least six daily servings of grain products, with at least three being whole grains to 50%.   |
| (Objective 19-8) Increase the proportion of persons aged 2 years and older who consume less than 10 percent of calories from saturated fat to 75%.   |
| (Objective 19-9) Increase the proportion of persons aged 2 years and older who consumer no more than 30 percent of calories from total fat to 75%.   |
| (Objective 19-10) Increase the proportion of persons aged 2 years and older who consume 2,400mg or less of sodium daily to 65%.  |
| (Objective 19-11) Increase the proportion of persons aged 2 years and older who meet dietary recommendations for calcium to 75%.   |
| (Objective 19-12) Reduce iron deficiency among young children and females of childbearing age to 5% of children aged 1 to 2 years, 1% for children aged 3 to 4 years and 7% for nonpregnant females aged 12 to 49 years.                 |
| (Objective 19-13) Reduce anemia among low-income pregnant females in their third trimester to 20%.   |
| (Objective 19-14) (Developmental) Reduce iron deficiency among pregnant females.   |
| (Objective 19-15) (Developmental) Increase the proportion of children and adolescents aged 6 to 19 years whose intake of meals and snacks at school contributes to good overall dietary quality.   |
| (Objective 19-16) Increase the proportion of worksites that offer nutrition or weight management classes or counseling to 85%.   |
| (Objective 19-17) Increase the proportion of physician office visits made by patients with a diagnosis of cardiovascular disease, diabetes, or hyperlipidemia that include counseling or education related to diet and nutrition to 75%. |
| (Objective 19-18) Increase food security among U.S. households to 94% and in so doing reduce hunger.   |

Source: *Healthy People 2010*, Chapter 19.  
<http://www.healthypeople.gov/Document/HTML/Volume2/19Nutrition.htm>

**Appendix E:** List of abbreviations.

|               |  |
|---------------|--|
| BMI .....     | Body Mass Index                            |
| BRFS .....    | Behavioral Risk Factor Survey              |
| CDC .....     | Centers for Disease Control and Prevention |
| L.M.A.S. .... | Luce-Mackinac-Alger-Schoolcraft            |
| MDCH.....     | Michigan Department of Community Health    |
| YRBS .....    | Youth Risk Behavior Survey                 |

**Appendix F: Methods****Prevalence**

Prevalence is the proportion of individuals in a population who have the disease or condition at a point in time or during a given time period. It is often used to describe the health burden on a given population. Prevalence is computed by dividing the number of existing cases at a particular point or period in time by the total population from which the cases came. It is often multiplied by 100 and expressed as a percent. In this report, prevalence estimates are generated in the analysis of data from the Behavioral Risk Factor Surveillance System and Youth Risk Behavior Survey.

$$\text{Prevalence} = \frac{\text{Number of existing cases of disease}}{\text{Total population}}$$

For example, 25.1% of adults in Michigan do not participate in leisure-time physical activity. This is the prevalence of no leisure-time physical activity. The number of survey respondents who reported no leisure-time physical activity was divided by the total number of respondents that were asked the question. This proportion is also weighted to adjusted for the survey design and nonresponse.

**Geographical Information System Mapping**

Environmental Systems Research Institute's (ESRI) ArcGIS Map was used to create the maps presented in the report. Data used in the maps were from the Behavioral Risk Factor Survey. Analyses of the data used in the maps were performed externally from the ArcGIS program.

**Appendix G:** Data Sources

**Name:** Michigan Behavioral Risk Factor Surveillance System

**Acronym:** BRFSS

**Basic Purpose and History:** The BRFSS is a source of estimates of the prevalence of certain health behaviors, conditions, and practices associated with leading causes of death. Michigan has conducted the BRFSS survey since 1987.

**Data Collection Process:** Annual estimates are based on data collected by telephone from a sample of Michigan adults selected using random-digit dial methods. It is a population-based representative sample of non-institutionalized Michigan residents. The data are weighted to represent estimates for the general adult population. BRFSS interviewers use a Computer Assisted Telephone Interviewing (CATI) system, which provides the interviewer with prompts. The interviewer types the respondent's responses directly into the computer, providing quality control and minimizing interviewer error.

**Population Included:** A record is a completed telephone interview. The selected respondent must be a Michigan resident, 18 years of age or older who lives in a private residence and has a telephone. One randomly selected adult from a household is interviewed.

**Additional Information:** For more information about the BRFSS and national data for comparison, visit <http://www.cdc.gov/brfss/index.htm>. For a complete report from the Michigan survey, visit <http://www.michigan.gov/brfs>.

*Fast Food Questions:*

- The next questions are about eating out. How often do you usually go to a fast food restaurant?
- When you go to a fast food restaurant, what is the main reason you choose this type of a restaurant instead of another type?
- 

**Name:** Youth Risk Behavior Survey

**Acronym:** YRBS

**Basic Purpose and History:** YRBS was designed to determine the prevalence of health-risk behaviors among high school students. It was also designed to monitor trends and progress toward achieving national health objectives. Michigan first administered the survey in 1997.

**Data Collection Process:** A two-stage cluster sampling method is implemented in which public schools with grades 9 through 12 are first selected, followed by classes within those schools. The questionnaire is self-administered by students. The survey is conducted every odd year at the national, state and local levels.

**Population Included:** Public and private school students in grades 9 through 12 are eligible to participate.

**Additional Information:** For more information about the YRBS and national data for comparison, visit <http://www.cdc.gov/HealthyYouth/yrbs/index.htm>.

**Appendix G: References**

1. U.S. Department of Health and Human Services and U.S. Department of Agriculture. “Dietary Guidelines for Americans, 2005.” 6th Edition, Washington, DC: U.S. Government Printing Office, January 2005.  
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<http://www.cdc.gov/nchs/products/pubs/pubd/hestats/physicalactivity/physicalactivity.htm>

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