2011

BURDEN OF OBESITY IN INDIANA

Indiana State
Department of Health

BURDEN OF OBESITY IN INDIANA

INDIANA STATE DEPARTMENT OF HEALTH

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Executive Summary

Overweight and obesity among Americans has risen to epidemic levels over the past decades. According to United States (U.S.) 2009 data, 63% of adults and 32% of children ages 10-17 years are overweight or obese. Among high school students, 28% are overweight or obese (1, 2, 3).

In Indiana, a staggering 65% (3.1 million) of adults are overweight or obese, which is an increase of 13% since 1995 (1). For youth, 2009 data indicate that 30% (209,316) of youth ages 10-17 years and 29% (88,674) of high school students are either overweight or obese (2, 3).

Certain behaviors and characteristics of Hoosiers have been determined to have a correlation to weight status, physical activity levels, and fruit and vegetable consumption. These correlations are important in identifying groups to target for interventions. Our analyses utilized data from various national surveillance systems providing statewide-level estimates. The overarching age groups were adults (≥18 years), high school students, youth (10-17 years), and children (2 to <5 years) on the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

The purpose was to identify those groups of people at highest risk for being overweight or obese and not meeting recommendations for fruit and vegetable consumption or physical activity levels. While there are other groups who were determined to have high risk, it is the groups below in the most need of intervention. Those groups at highest risk are:

Populations at Highest Risk for Overweight or Obesity

Adults who are one of the following:

- Men
- Not engaging in ≥300 minutes of physical activity per week
- Married
- 35-74 years of age

High school students who are doing one of the following:

- Not participating in sports in the past year
- Engaging in <60 minutes of physical activity per day
- Viewing television ≥3 hours per day

Youth ages 10 to 17 who are:

- Playing video games or watching television/videos 1 or more hours per weekday

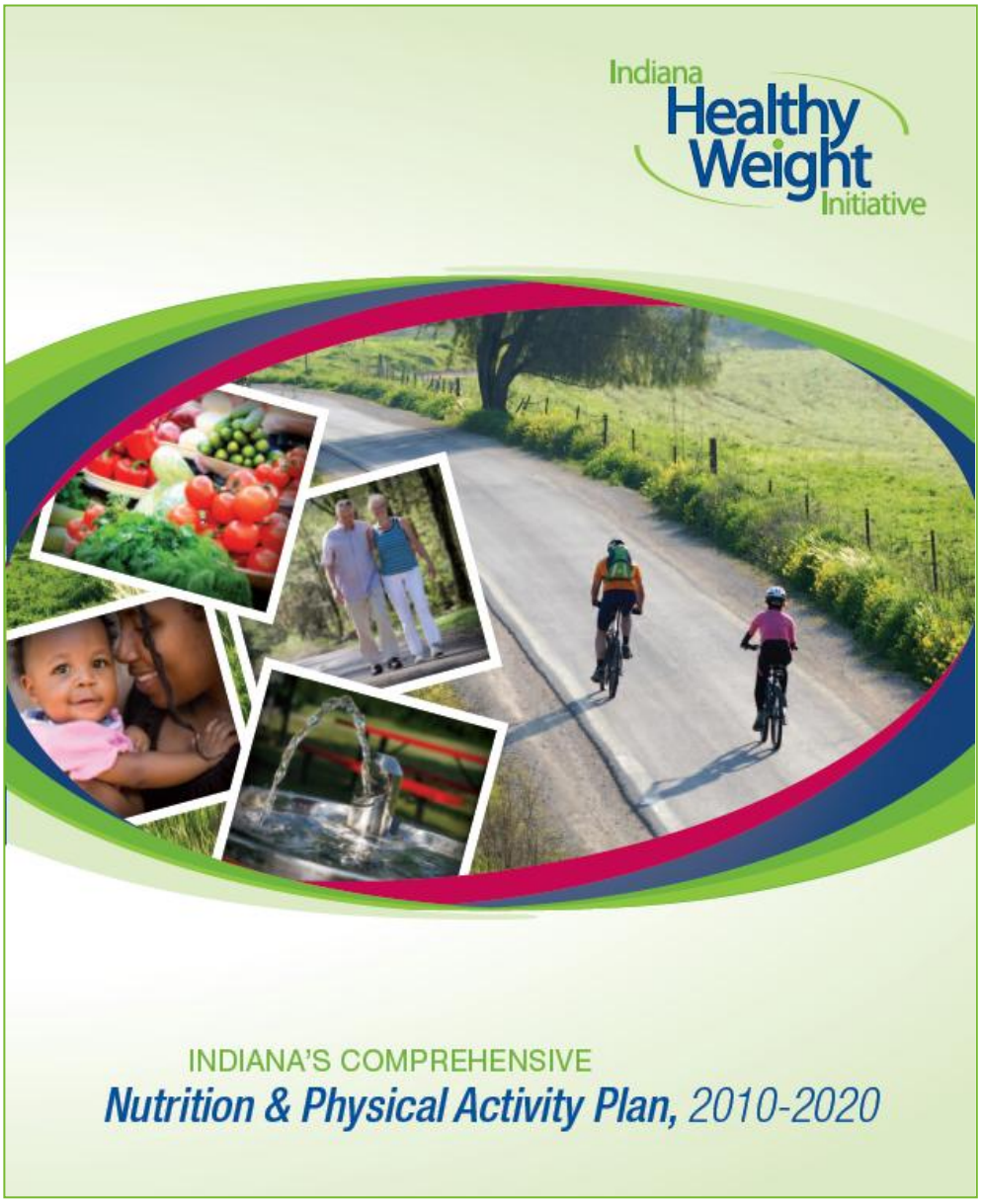
Children ages 2 to 5 receiving WIC support who are one of the following:

- Black or Hispanic
- Not receiving Medicaid
- Watching television 3 or more hours per day
- Male
- 3 or 4 years of age
- 131-150% Federal Poverty Level (FPL)

Detailed results follow in the full report. The report provides a roadmap for targeting interventions for these groups and others in order to improve weight status, physical activity levels, and fruit and vegetable consumption. Overall, Indiana needs to accelerate statewide efforts aimed at eliminating risk factors that lead to overweight and obesity and decreasing the prevalence of the condition itself. *Indiana's Comprehensive Nutrition and Physical Activity Plan, 2010-2020,* outlines the goals and objectives for individuals and organizations to reduce overweight and obesity in Indiana.

Find the Plan at:

http://www.inhealthyweight.org/files/IN_State_Obesity_Plan_2010-2020.pdf.



Introduction

Overweight and obesity among Americans has risen to epidemic levels over the past decades. According to 2009 data, a staggering 65% (3.1 million) of Indiana's adults are overweight or obese, an increase of 13% since 1995 (1). Although this number is lower among Indiana youth, it is still too high. The most recent data show that 30% (209,316) of youth ages 10-17 years and 29% (88,674) of high school students are either overweight or obese (2, 3).

For the United States (U.S.) as a whole, overweight and obesity combined for adults is 63%; for youth ages 10-17 years, 32%; and for high school students, 28% (1, 2, 3).

Many factors have contributed to the increase in obesity: our busy lifestyles; greater access to inexpensive, high-calorie, fat- and sugar-laden food; and the convenience and affordability of eating out more often. In many instances, our physical environment does not make basic physical activities, such as walking and riding a bicycle, attractive or safe. The result is a diet poor in fruit and vegetable consumption and a lack of physical activity, two of the major factors that contribute to obesity. Fruits and vegetables are important, as they are low in calories and high in fiber, two factors that help to control weight. Physical activity is good for overall health and helps burn off excess calories that would otherwise add to one's weight. Nutrition and physical activity behaviors are the most modifiable behavioral factors leading to overweight and obesity and, consequently, the target of many interventions to control weight and improve overall health. In Indiana, only 41% of adolescents and 64% of adults meet the recommended levels for physical activity (1, 2). The drive to increase fruit and vegetable consumption for adolescents and adults in Indiana has seen little success. In 2009, only 16% of adolescents and 21% of adults consumed the recommended five or more servings of fruits and vegetables daily (1, 2). As with the U.S. prevalence, Indiana's prevalence in these areas needs to improve.

Research has shown that other nutritional factors besides fruit and vegetable consumption contribute to becoming overweight or obese. These factors include not being breastfed as an infant, consumption of high-energy dense foods (high number of calories in a small amount of food), soda consumption, and TV viewing (4). Mechanisms for the relationship between TV viewing and obesity include a reduction of resting metabolic rate, displacement of physical activity, excess energy intake while watching TV and exposure to marketing of high-energy dense foods (4). Other factors that are more difficult or impossible to modify include genetics, medications, social networks, economics (income status and education level), too little sleep, and medical conditions (5).

Because the causes of overweight and obesity are complex and varied, no single intervention can curtail the epidemic, making it difficult to manage. Therefore, in order to control the weight status of individuals and populations as a whole, it is necessary to implement a comprehensive set of measures across multiple levels of society and in many settings.

Definitions

Weight

"Underweight," "normal," "overweight" and "obese" are all labels for ranges of weight. Obese and overweight describe ranges of weight that are *greater* than what is considered healthy for a given height. Underweight describes a weight that is *lower* than what is considered healthy. At an individual level, Body Mass Index (BMI) can be used as a screening tool but is not diagnostic of the body fatness or health of an individual. A health care provider should perform appropriate health assessments in order to evaluate an individual's health status and risks (7).

Adults ages 18 and older. Weight status for adults 18 years of age and older is determined by calculating a person's weight compared to their height (BMI) using a formula (Table 1). By definition, the BMI for overweight ranges from 25.0-29.9, while for obesity, the BMI is 30.0 and above.

Table 1. Body Mass Index (BMI) categories for adults

Weight Status Category	**BMI**
Underweight	Below 18.5
Adequate Range	18.5–24.9
Overweight	25.0–29.9
Obese	30.0 and above

Children and adolescents ages 2-18. Growth charts, together with plotting BMI status by age and gender for children and adolescents, determine whether weight is within an adequate range (Appendix A). The definition of overweight is a BMI greater than or equal to the 85th percentile but below the 95th percentile. The obesity definition is a weight for height greater than or equal to the 95th percentile. Table 2 displays the ranges for all weight categories.

Table 2. Body Mass Index (BMI) categories for children

Weight Status Category	**Percentile**
Underweight	Less than the 5th percentile
Adequate Range	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

Physical Activity and Fruit and Vegetable Consumption

See Appendix B for definitions and recommendations.

Health and Health Care Costs

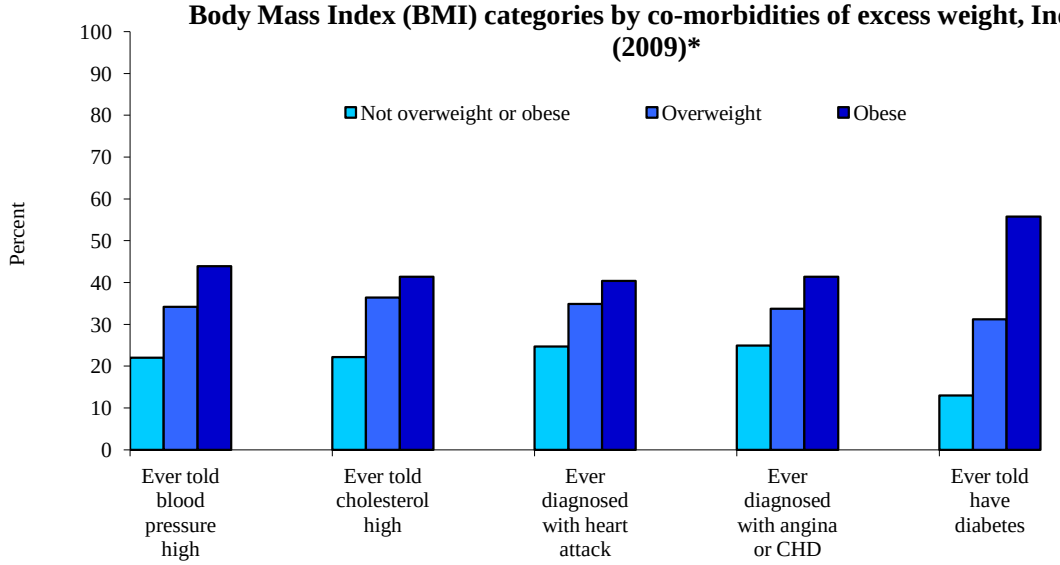
Diseases and Health Conditions

For adults, increased risk of chronic disease and other health conditions occurs with being overweight or obese. These health issues include:

- Hypertension
- High total cholesterol, low HDL cholesterol, and/or high levels of triglycerides
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea and respiratory problems
- Some cancers (e.g., endometrial, breast, and colon)

In Indiana, adults (18 years and older) considered to be obese and overweight show the highest representation in weight-related co-morbidities. In these individuals, the existence of high blood pressure (78%), high cholesterol (78%), diagnosis of heart attack (75%), and diagnosis of angina or coronary heart disease (78%) are approximately three times higher compared to those adults who are not considered to be overweight or obese, while for diabetes (87%), it is almost seven times higher. (1) (Figure 1).

Figure 1.



*Data are for residents ages 18 years and older.
Data Source: 2009 Indiana BRFSS Data.

Adults are not the only group who experience adverse health consequences from being overweight or obese. Children and adolescents (≤18 years) also have significant health risks associated with being overweight or obese. These health issues include (8):

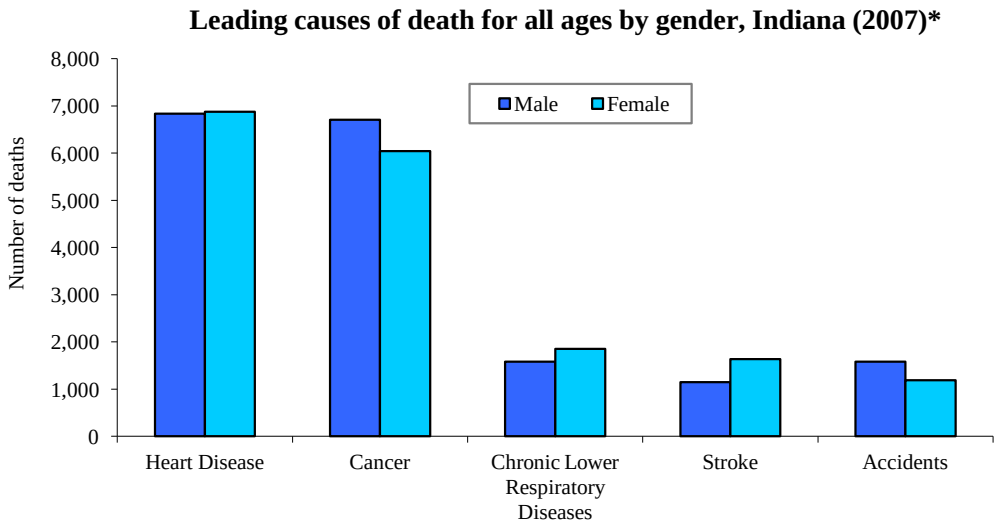
- High cholesterol, abnormal amount of lipids (e.g., cholesterol and/or fat) in the blood and high blood pressure
- Above-normal levels of insulin in the blood, insulin resistance, impaired glucose tolerance, and type 2 diabetes mellitus
- Menstrual irregularities
- Depression and low self-esteem
- Asthma and obstructive sleep apnea
- Orthopedic problems
- Nonalcoholic fatty liver disease

For these health issues, of particular note is the increase in type 2 diabetes, in the past seen primarily as a development in middle age. Although the rate of type 2 diabetes in children is very low (0.25%), it has increased in recent years. More than 75% of children and adolescents with type 2 diabetes are obese. Having a diagnosis of type 2 diabetes so early in life increases the risk of subsequent complications now and later in life (9).

Mortality

Of the top six (five are listed below) leading causes of death among Indiana residents, three (heart disease, cancer, and stroke) are related to obesity, poor diet and lack of physical activity (Figure 2).

Figure 2.



*Indiana State Department of Health, Indiana Mortality Report, 2007.

Table 3 shows that poor diet and physical activity place second on the list for actual causes of death. It is the only one on the list besides motor vehicle deaths to show a percent increase from 1990 to 2000 (10).

Table 3. Actual causes of death in the U.S., 1990 and 2000

Actual Cause	No. (%) in 1990	No. (%) in 2000
Tobacco	400,000 (19)	435,000 (18.1)
Poor diet and physical activity	300,000 (14)	400,000 (16.6)
Alcohol consumption	100,000 (5)	85,000 (3.5)
Microbial agents	90,000 (4)	75,000 (3.1)
Toxic agents	60,000 (3)	55,000 (2.3)
Motor vehicle	25,000 (1)	43,000 (1.8)
Firearms	35,000 (2)	29,000 (1.2)
General behavior	30,000 (1)	20,000 (0.8)
Illicit drug use	20,000 (<1)	17,000 (0.7)
Total	1,060,000 (50)	1,159,000 (48.2)

Health Care Costs

In addition to increased disease and mortality, overweight and obesity have significantly increased health care costs. From 1998-2006, there was an 89% increase in spending on treatment for obesity-related diseases. Overall, individuals who were obese spent $1,429 (42%) more for medical care in 2006 than did individuals who were at a healthy weight. Health costs for obesity may be as much as $147 billion annually (6).

Indiana Goals

In 2008, Indiana was one of 22 states awarded a grant to support nutrition and physical activity efforts. One of the important initiatives the Indiana State Department of Health (ISDH) undertook was the creation of the Indiana Healthy Weight Initiative (IHWI). A key activity of the Initiative included the formation of a task force to develop a strategic plan to address obesity in Indiana.

In January 2011, the ISDH, in collaboration with the IHWI Task Force, launched *Indiana's Comprehensive Nutrition and Physical Activity Plan, 2010-2020* (11). The Plan established goals, objectives, and strategies that focus on decreasing the prevalence of obesity in Indiana and improving outcomes within the majority of the Centers for Disease Control and Prevention (CDC) priority target areas. These areas include:

- Increase the consumption of fruits and vegetables
- Decrease the consumption of high-energy dense foods (foods that contain a lot of calories but are small in size)
- Decrease the consumption of sugar-sweetened beverages
- Decrease television viewing time
- Increase physical activity
- Increase the initiation, duration, and exclusivity of breastfeeding

Except for television viewing and high-energy dense foods (for which measures are currently in development), the IHWI established future long-term targets for improvement by 2020. These targets are displayed in Table 4 below.

Table 4. Indiana Healthy Weight Initiative Targets

Healthy Weight and Obesity

- Increase the percentage of adults who are at a healthy weight from 35% to 38% by 2020.
- Increase the percentage of high school students who are at a healthy weight from 71% to 76% by 2020.
- Decrease the percentage of adults who are obese from 30% to 25% by 2020.
- Decrease the percentage of high school students who are obese from 13% to 10% by 2020.

Physical Activity

- Increase the percentage of adults who meet the recommended amounts of physical activity per day from 64% to 68% by 2020.
- Increase the percentage of high school students who meet the recommended amounts of physical activity per day from 41% to 55% by 2020.

Fruit and Vegetable Consumption

- Increase the percentage of adults who eat the recommended amounts of fruits and vegetables per day from 21% to 24% by 2020.
- Increase the percentage of high school students who eat the recommended amounts of fruits and vegetables per day from 16% to 21% by 2020.

Breastfeeding

- Increase the percentage of mothers who breastfeed their babies from 71% to 75% by 2020.
- Increase the percentage of mothers who breastfeed their babies exclusively at 3 months from 29% to 40% by 2020.
- Increase the percentage of mothers who breastfeed their babies at 6 months from 38% to 50% by 2020.
- Increase the percentage of mothers who breastfeed their babies at 12 months from 17% to 25% by 2020.

Sugar-Sweetened Beverage Consumption

- Decrease the percentage of adults who drink 1 or more sugar-sweetened beverages per day from 69% to 59% by 2020.
- Decrease the percentage of high school students who drank a can, bottle, or glass of soda or pop 1 or more times per day during the past 7 days from 30% to 22% by 2020.

Trends

Trend data for overweight and obesity and the CDC's six priority target areas for which there are two or more years of data are presented on the following pages. In addition, trends are presented for age groups for which data are available.

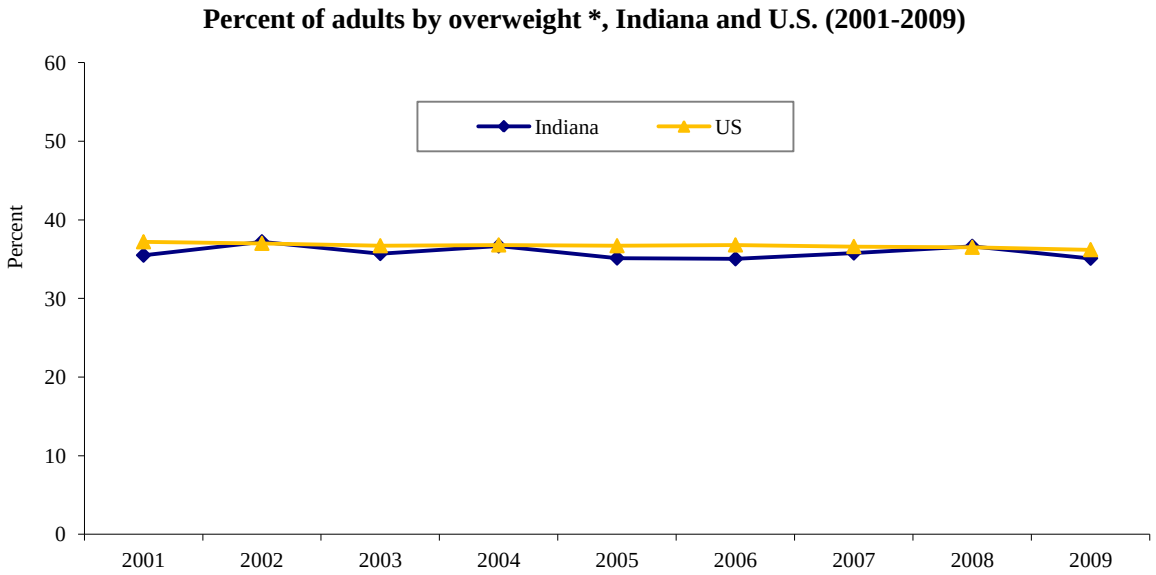
The development of goals for Indiana was not undertaken where there were limitations with the availability of reliable, comparative data. In addition, a goal for overweight status was not developed, because the numbers in that category fluctuate due to some individuals entering overweight status after gaining weight (from a healthy weight) and others entering overweight status after losing weight (from an obese status). Because data do not identify those individuals who enter the overweight category as a result of losing weight, it is not a good indicator of weight gain occurring in the population.

Overweight and Obesity

Adults

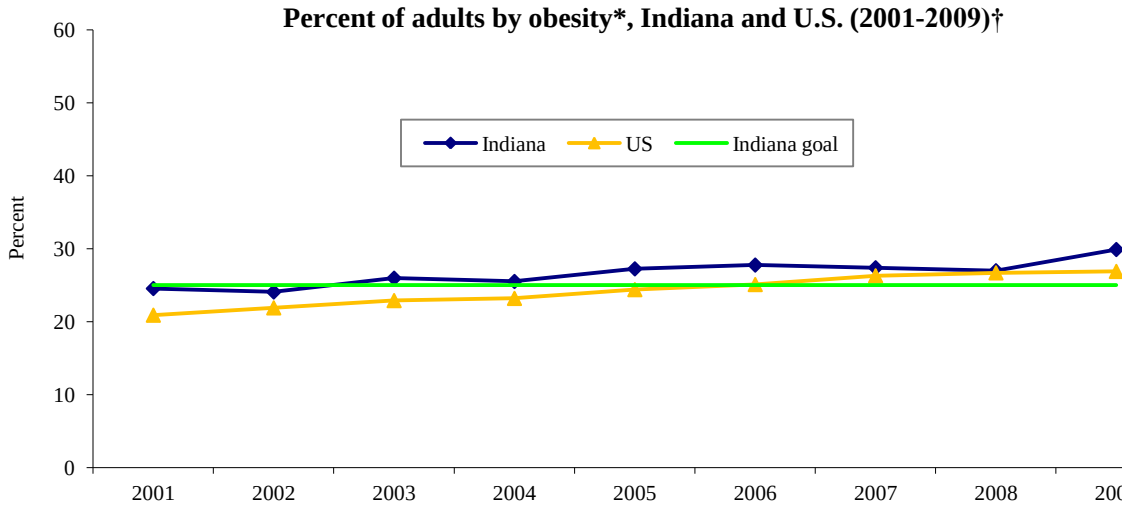
From 2001 to 2009, overweight remained relatively stable in both Indiana (36%-35%) and the United States (U.S.) (36%-37%) (Figure 3) (1). Obesity climbed significantly, about 10 percentage points, from 1995 to 2009. The Indiana goal for the percent of adults considered obese is 25% by 2020. Adult obesity for Indiana in 2009 was 30%, up from 25% in 2001 (Figure 4). In the U.S., the prevalence of adults considered obese has climbed as well, from 21% in 2001 to 27% in 2009 (Figure 4).

Figure 3.



*Overweight is a BMI 25.0-29.9.
†Data are for residents ages 18 years and older.
Data Source: 2009 BRFSS Data.

Figure 4.



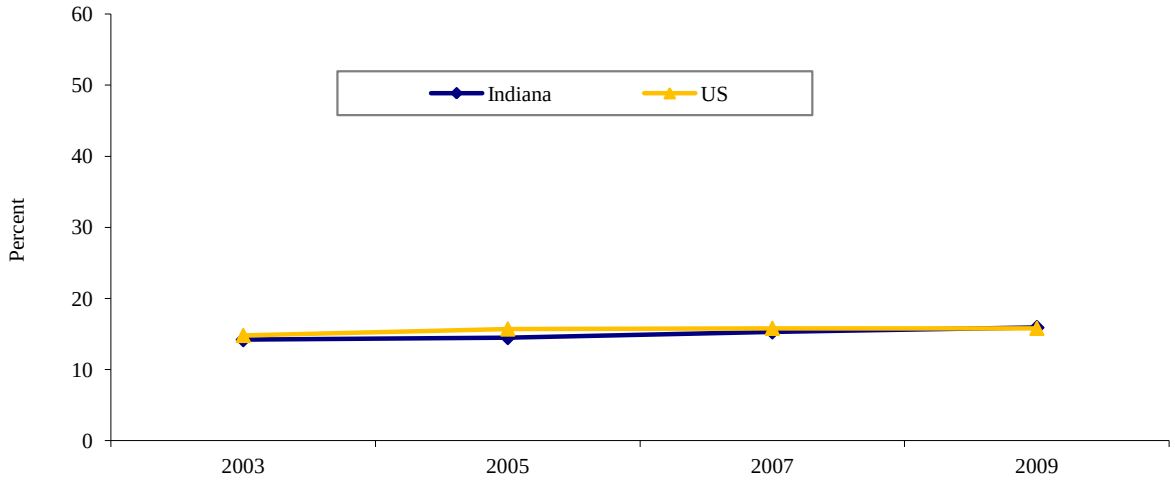
*Obese is a BMI ≥30.0.
†Data are for residents ages 18 years and older.
Data Source: 2009 BRFSS Data.

High School Students

In 2009, high school students (grades 9-12) were just as likely to be considered overweight or obese as in 2003. In 2003, 14% of Indiana high school students were considered to be overweight, increasing to 16% in 2009. The percent of high school students considered to be overweight increased at the national level as well, from 15% in 2003 to 16% in 2009 (2) (Figure 5). There is no Indiana goal for the prevalence of overweight. The percent of high school students considered obese in Indiana increased from 12% in 2003 to 13% in 2009. The Indiana goal for the percent of high school students considered obese is 10% by 2020. Obesity at the national level has remained steady at 12% from 2003 to 2009 (2) (Figure 6).

Figure 5.

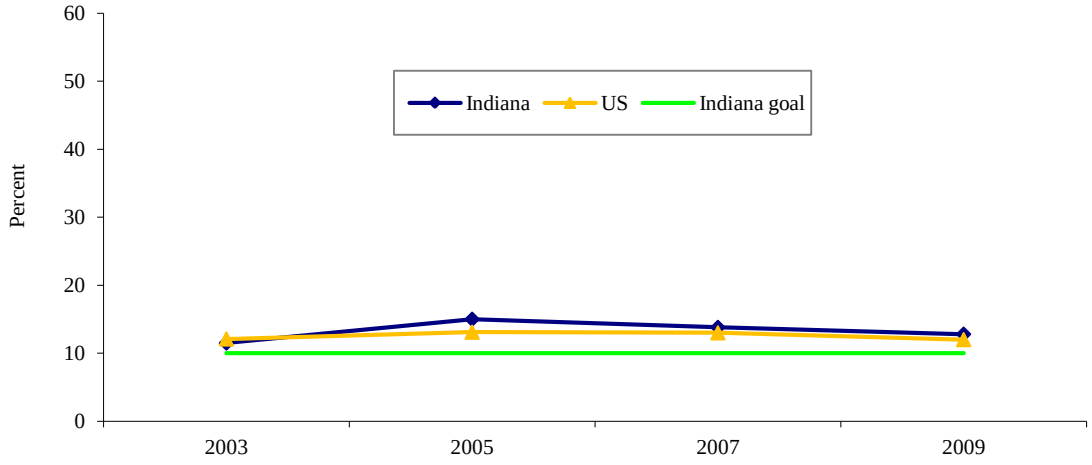
Percent of high school students by overweight *, Indiana and U.S. (2003-2009)†



*Overweight is a BMI ≥85th percentile to <95th percentile.
†Data are for high school students in grades 9-12.
Data Source: 2009 YRBS Data.

Figure 6.

Percent of high school students by obesity*, Indiana and U.S. (2003-2009)†

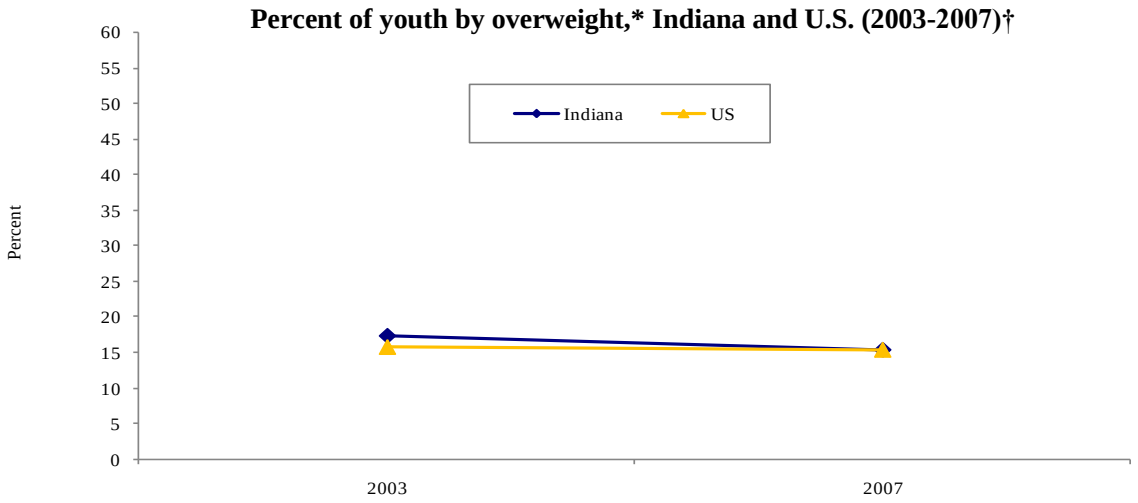


*Obese is a BMI ≥95th percentile.
†Data are for high school students in grades 9-12.
Data Source: 2009 YRBS Data.

Youth ages 10-17

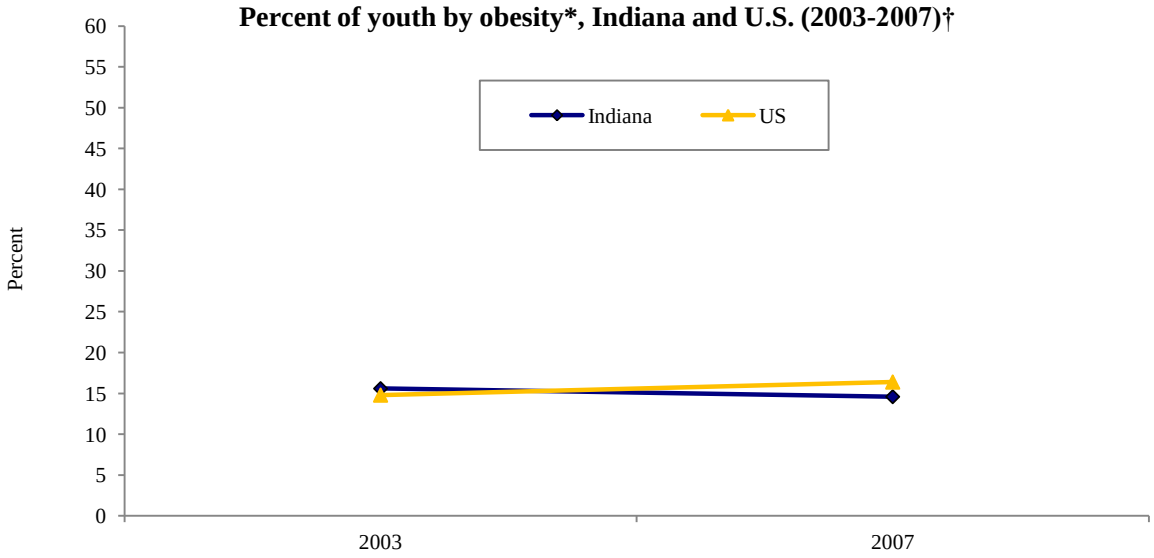
From 2003 to 2007, the percent of Indiana children considered to be overweight decreased from 17% in 2003 to 15% in 2007, while for the U.S., the percent went from 16% to 15% (3) (Figure 7). During the same time period, the percent of children considered to be obese was relatively stable for both Indiana and the U.S. (Figure 8). Currently, there is no Indiana goal for reducing obesity in this age group.

Figure 7.



*Overweight is a BMI ≥85th percentile to <95th percentile.
†Data are for youth ages 10-17 years.
Data Source: 2003 and 2007 NSCH Data.

Figure 8.

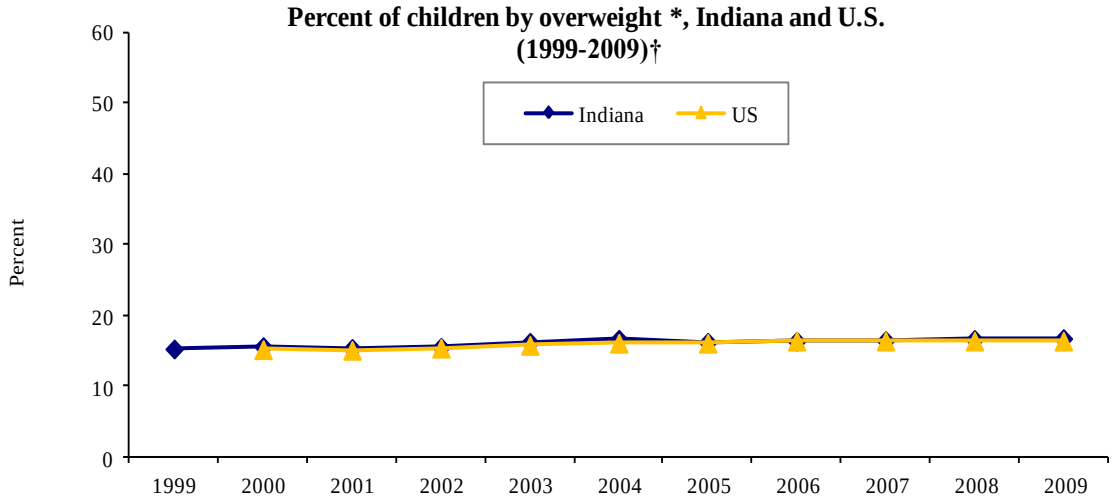


*Obese is a BMI ≥95th percentile.
†Data are for youth ages 10-17 years.
Data Source: 2003 and 2007 NSCH Data.

Children ages 2 to <5 years

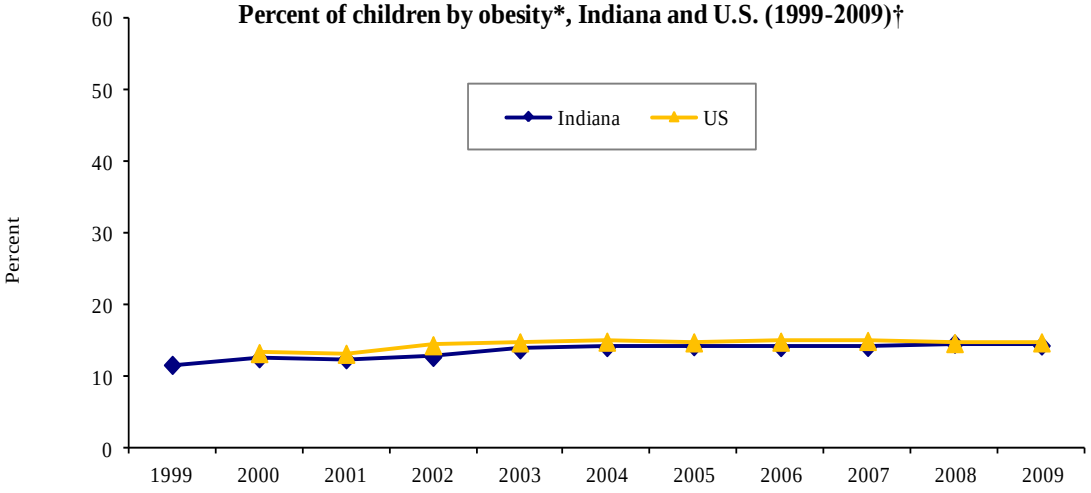
The Pediatric Nutrition Surveillance System (PedNSS) contains data on the weight status of participants in Indiana's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). From 1999 to 2009, the percent of Indiana children ages 2 to <5 considered to be overweight increased from 15% to 17% (12) (Figure 9). Nationally during the same timeframe, overweight in this age group rose from 15% to 16% (12) (Figure 9). The percent of children considered obese in Indiana rose from 12% in 1999 to 14% in 2009 and nationally from 13% to 15% during the same timeframe (12) (Figure 10). Currently, there is no Indiana goal for reducing obesity in this group.

Figure 9.



*Overweight is a BMI ≥85th percentile to <95th percentile.
†Data are for children ages 2 to <5 years.
Data Source: 2009 PedNSS Data.

Figure 10.



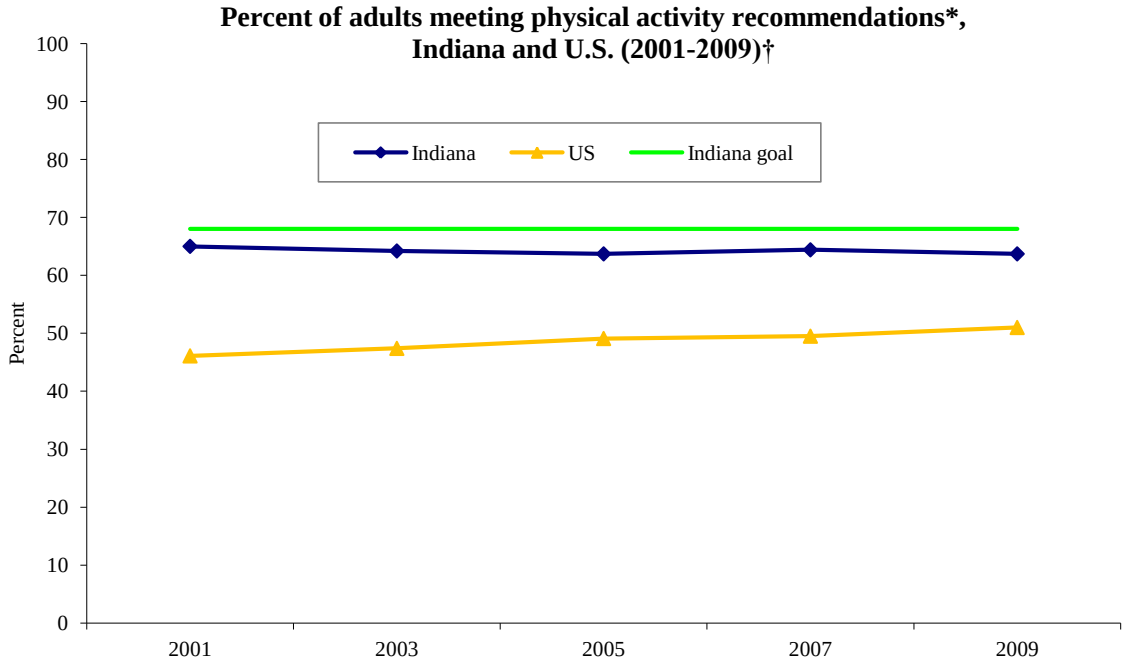
*Obese is a BMI ≥95th percentile.
†Data are for children ages 2 to <5 years.
Data Source: 2009 PedNSS Data.

Physical Activity Levels

Adults

The percentage of Indiana adults who met the recommended levels of physical activity decreased slightly from 2001 to 2009. In 2001, 65% reported physical activity levels that met recommended amounts, compared to 64% in 2009. The Indiana goal for physical activity for adults is 68%. Nationally, the percentage rose from 46% to 51% during this time (1) (Figure 11).

Figure 11.

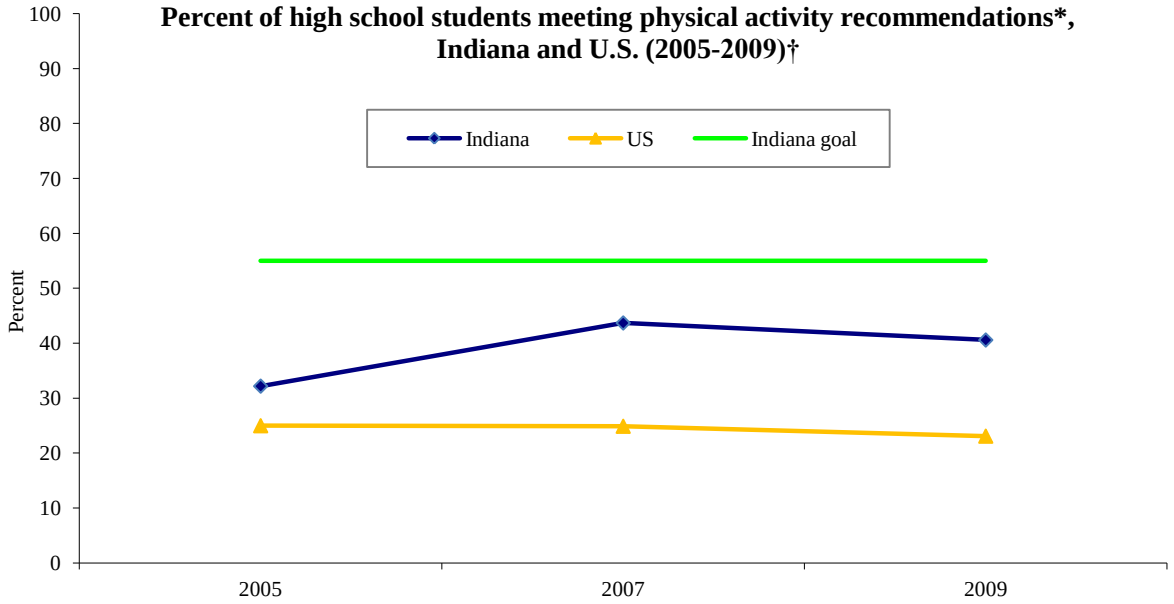


*Moderate physical activity for 150 minutes per week or vigorous physical activity for 75 minutes per week or combination of both.
†Data are for residents ages 18 years and older.
Data Source: 2009 BRFSS Data.

High School Students

The percentage of Indiana high school students (grades 9-12 combined) who met the recommended levels of physical activity showed a slight drop from 2007 (44%) to 2009 (41%). The Indiana goal for physical activity in this group is 55%. Nationally, the percentage dropped slightly from 25% (2007) to 23% (2009) (2) (Figure 12).

Figure 12.



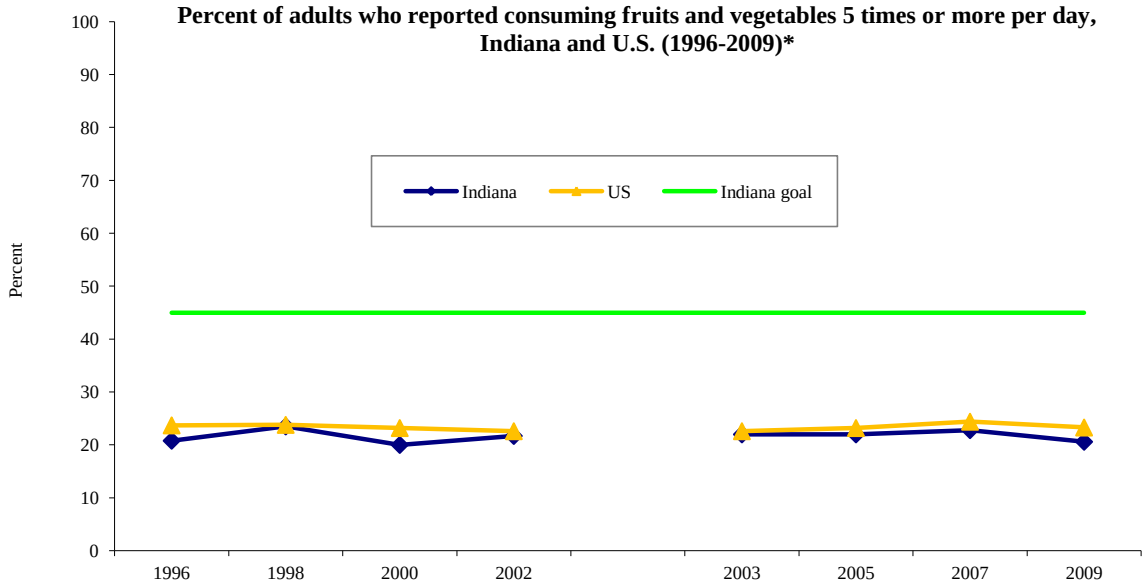
*At least 60 minutes (1 hour) or more of physical activity daily.
†Data are for high school students in grades 9-12.
Data Source: 2009 YRBS Data.

Fruit and Vegetable Consumption

Adults

In 1996, 21% of Indiana's adults consumed the recommended amounts of fruits and vegetables (five or more servings per day). Although the percentage fluctuated slightly during the period from 1996 to 2009, it returned to 21% in 2009. The Indiana goal for fruit and vegetable consumption for adults is 24%. Nationally, the percent remained the same during this period at 23% (1) (Figure 13).

Figure 13.

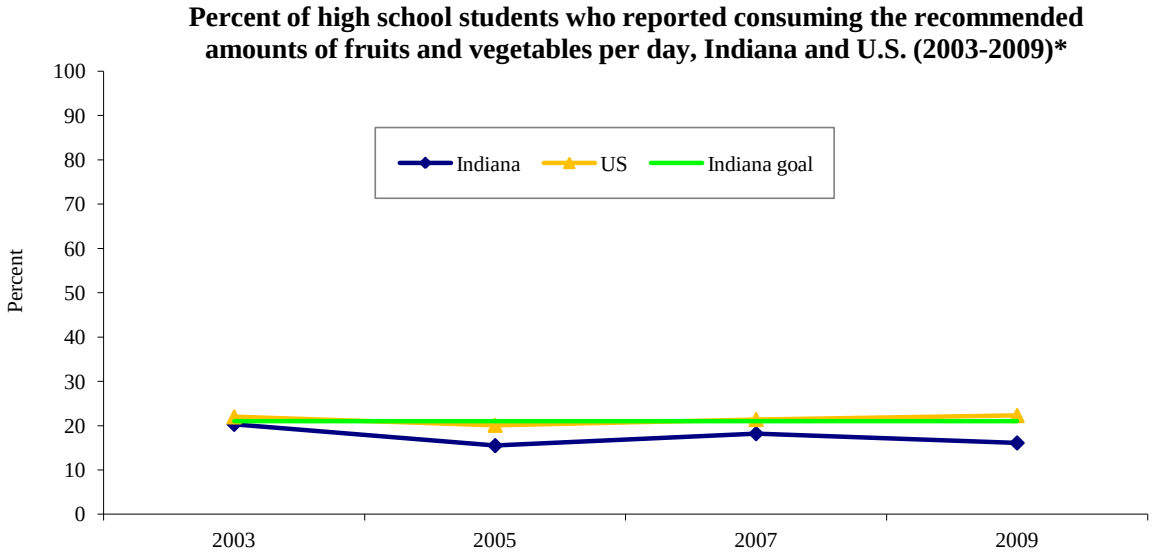


*Data are for residents ages 18 years and older.
†Data collection changed from even years to odd years in 2003.
Data Source: 2009 BRFSS Data.

High School Students

The percentage of Indiana high school students who consumed the recommended amounts of fruits and vegetables in 2003 was 20% and declined significantly in 2009 to 16%. The Indiana goal for fruit and vegetable consumption for high school students is 21%. Nationally, the percent remained at 22% in 2003 and 2009 (2) (Figure 14).

Figure 14.



*Data are for high school students in grades 9-12.
Data Source: 2009 YRBS Data.

Breastfeeding

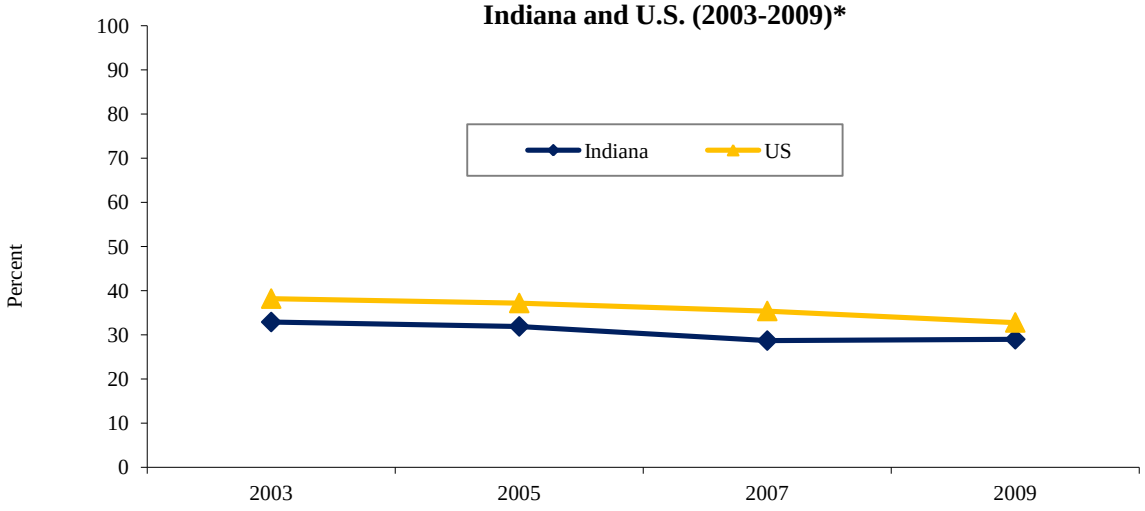
Breastfeeding at hospital discharge has steadily increased from 1997 to 2007, from 54% in 1997 to 67% in 2007 (13). The Indiana goal for breastfeeding at discharge is 75%. National data for this measure are not available; however, the National Immunization Survey offers a comparable variable of breastfeeding in the early postpartum period. Those numbers increased from 68% to 75% during the period of 1999 to 2007 (14).

Television Viewing

High School Students

For all students, the percentage of those watching three or more hours of television a day showed a significant decrease from 2003 (33%) to 2009 (29%). There is no Indiana goal for this group. Nationally, the percent declined, going from 38% to 33% during the same period (2) (Figure 15).

Figure 15. **Percent of high school students viewing television 3 hours or more per day, Indiana and U.S. (2003-2009)***

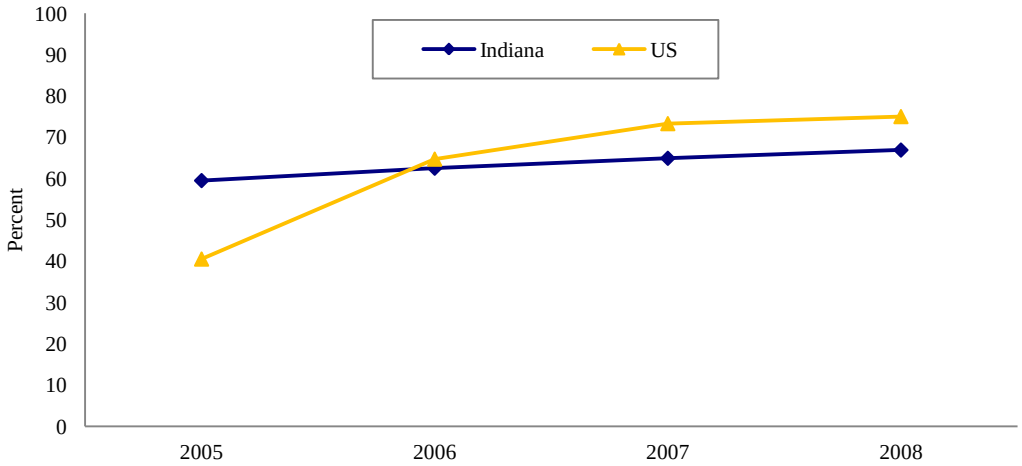


*Data are for high school students in grades 9-12.
Data Source: 2009 YRBS Data.

Children Ages 2 to <5 Years

For children, television viewing ≤2 hours per day steadily increased from 60% in 2005 to 67% in 2008. Currently, there is no Indiana goal for this group. Nationally, the percent increased during the same period, rising from 41% in 2005 to 75% in 2008 (12) (Figure 16).

Figure 16. **Percent of children viewing television <= 2 hrs per day, Indiana and U.S. (2005-2008)***



*Data are for children ages 2 to <5 years.
Data Source: 2009 PedNSS Data.

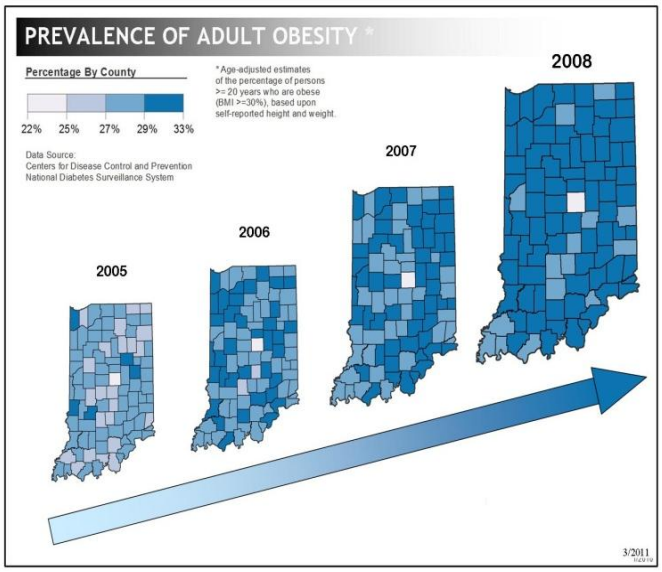
Geographic Distribution

Overweight and Obesity

Adults

These maps show how obesity has increased markedly in Indiana counties over four years (15). In 2005, 31 counties had obesity levels at 28% and greater. However, by 2008, adult obesity had increased to 28% or greater in all but two counties (Hamilton with 24% and Monroe with 27%). (Figure 17). (See Appendices C-F for larger versions of the maps and their corresponding values.) This increase, however, was not statistically significant.

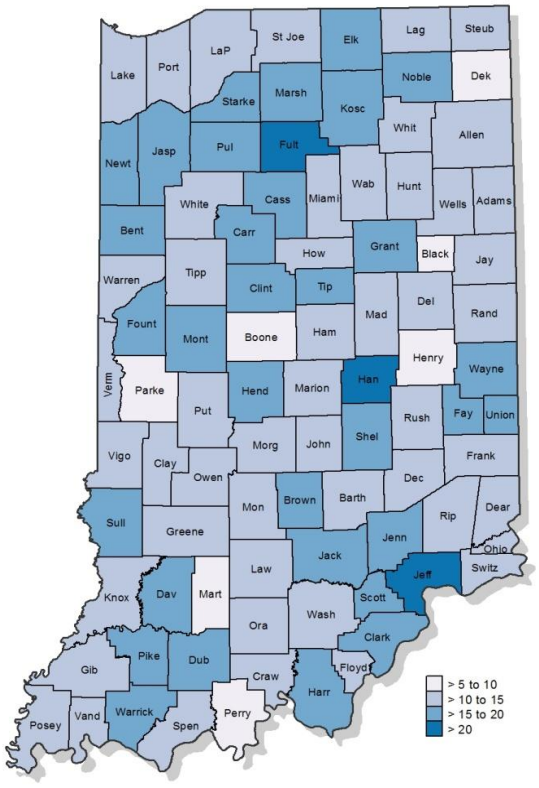
Figure 17. Prevalence of adult obesity by county, Indiana (2005-2008)



Children ages 2 to <5 years

Combined 2005 to 2007 data show that over 5% of low-income children were obese in all Indiana counties, with three counties (Fulton, Hancock, and Jefferson) having more than 20% of low-income children who were considered obese (12) (Figure 18). (See Appendix G for a larger version of the map and corresponding values.)

Figure 18. Prevalence of obesity in Indiana among children ages 2 to <5 years (2005-2007)



Source: 2005-2007 Pediatric Nutrition Surveillance System (PedNSS)

Characteristics of Overweight and Obesity

Risk factors related to adult weight status include poverty, education status and use of public health insurance. Indiana does not fare well with these risk factors when compared to other states. According to the U.S. Census Bureau, Indiana's poverty rate is 14%. This places the state 21st (with first being the highest) in the U.S. (16). Among adults ages 25 years and older, Indiana ranked 29th for those with a high school diploma or more, and 44th for those with a bachelor's degree or more (16). For adults ages 18-64, 8% received public health insurance, placing Indiana 28th (first being the highest) nationwide (16). Risk factors related to childhood obesity in the U.S. include poverty, public health insurance only, children in populations with high obesity rates, children in groups that experience health disparities and children whose parents are obese (17). Of these, Indiana data exist for poverty and public health insurance. In Indiana, poverty increased in children younger than 18 years of age, from 12% in 2000 to 20% in 2009 (16). For children in this same age range who are on public health insurance, Indiana ranked 21st at 20% (with first being highest) (18).

To determine additional characteristics related to weight status specific to Indiana residents, analyses were undertaken using data from various surveillance systems with statewide data. Appendices H-P provide the explanation for variables selected for comparison, resulting numbers, percentages, and statistical results. Below is a discussion of the results showing characteristics having a strong relationship (p-value <.002) with overweight and obesity, physical activity and fruit and vegetable consumption. Slightly related variables within the groups presented were found to have a p-value of .0025 to less than .05.

Adults

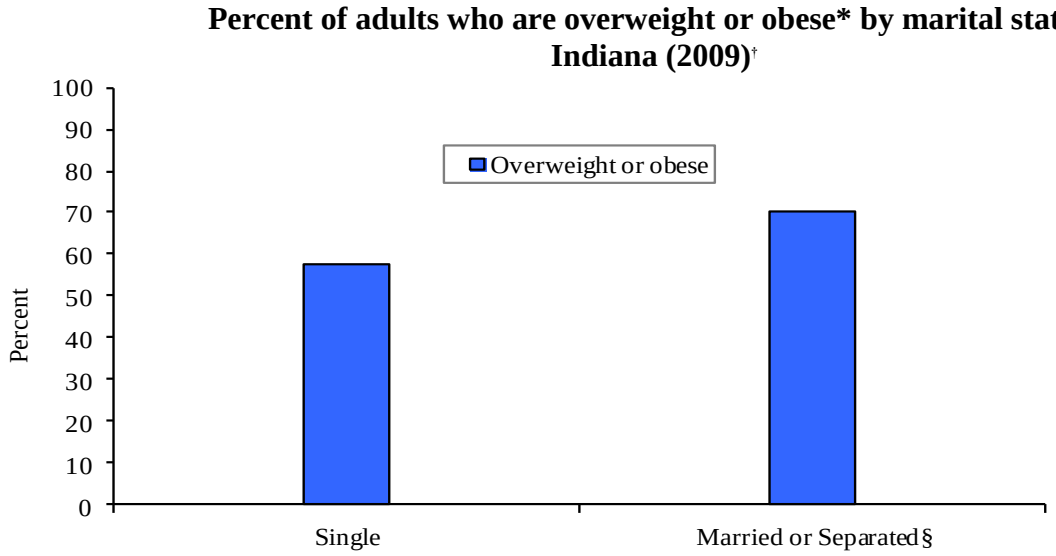
The percentage of adults considered to be overweight and obese continues to exceed that of normal or underweight individuals in Indiana, even after accounting for demographic subgroups. Demographic and behavioral variables of marital status, employment status, gender, race/ethnicity, age, education, income and health insurance, physical activity and fruit and vegetable consumption were examined to determine their influence on weight status.

Five variables were strongly related to weight status, including marital status, gender, age and physical activity (150 and 300 minutes per week). Other variables slightly related to weight status were: employment status (unemployed less likely to be overweight/obese vs. employed), income (those earning less than $15,000 less likely to be overweight/obese vs. those earning $50,000 or more), health insurance (those with no health insurance less likely to be overweight or obese than those with health insurance), and fruit and vegetable consumption (those consuming less than five a day more likely to be overweight or obese vs. those who consumed five or more a day).

Weight status and marital status of adults

Marital status was strongly related to being overweight or obese. Married adults were more likely to be overweight or obese than single adults. Of married adults, 70% were reportedly overweight or obese, while 58% of single adults were reportedly overweight or obese in 2009 (1) (Figure 19).

Figure 19.

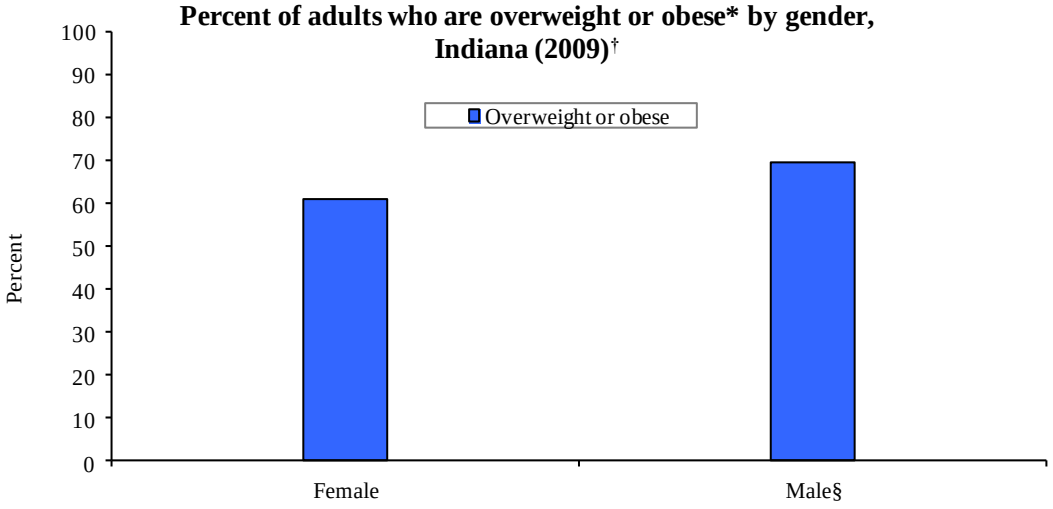


*Overweight is a BMI 25.0-29.9 and obesity is a BMI ≥30.0.
†Data are for adults ages 18 years and older.
§Category is strongly related to being overweight or obese when compared to the category of "Single".
Data Source: 2009 Indiana BRFSS Data.

Weight status and gender of adults

Gender was also strongly related to overweight or obesity. Males were more likely to be overweight or obese than females. For males, 69% were overweight or obese, while among females, 61% were overweight or obese (1) (Figure 20).

Figure 20.

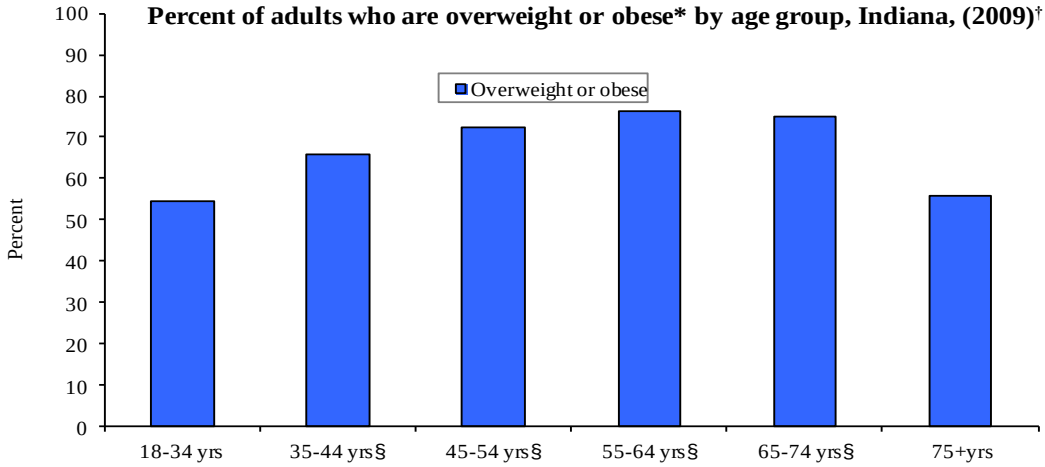


*Overweight is a BMI 25.0-29.9 and obesity is a BMI ≥30.0.
†Data are for adults ages 18 years and older.
§Category is strongly related to being overweight or obese when compared to the category of "Female".
Data Source: 2009 Indiana BRFSS Data.

Weight status and age of adults

Age was strongly related to weight status. Reviewed were overweight and obesity among adults ages 18-34, 35-44, 45-54, 55-64, 65-74 and 75+. All age groups were compared individually to adults ages 18-34. All of the age groups except for adults ages 75 years and older were more likely to be considered overweight or obese when compared to adults ages 18-34 (1) (Figure 21).

Figure 21.

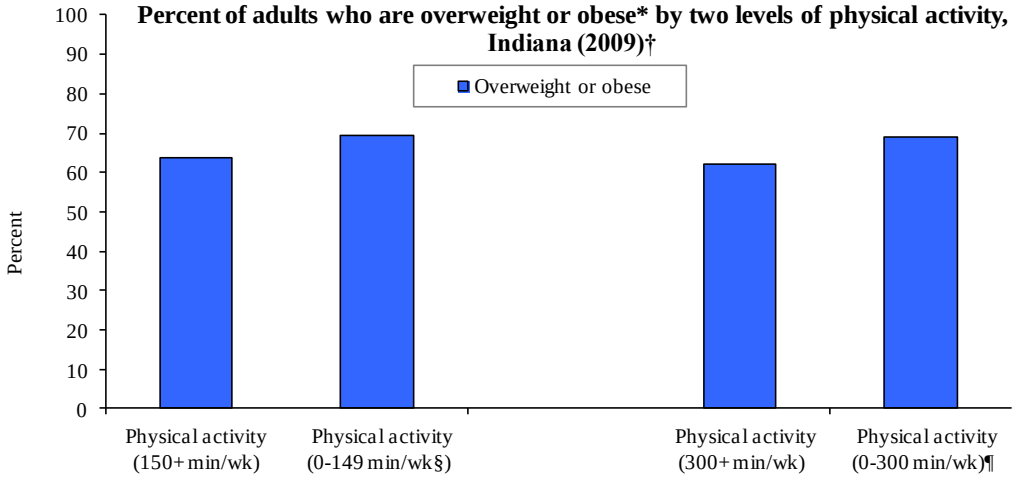


*Overweight is a BMI 25.0-29.9 and obesity is a BMI ≥30.0.
†Data are for adults ages 18 years and older.
§Category strongly related to being overweight or obese when compared to the category of "18-34 yrs".
Data Source: 2009 Indiana BRFSS Data.

Weight status and physical activity in adults

Adults who were overweight or obese were more likely to have physical activity levels below the recommended 150 minutes per week and 300 minutes per week. Only 64% in this group reported physical activity at 150 minutes or more each week, with 70% reporting less than 150 minutes or more. Only 62% reported 300 minutes or more of physical activity per week, while 69% reported less than that (1) (Figure 22).

Figure 22.



*Overweight is a BMI 25.0-29.9 and obesity is a BMI ≥30.0.
†Data are for adults ages 18 years and older.
§Category is strongly related to being overweight or obese when compared to the category of "Physical Activity 150+ min/wk".
¶Category is strongly related to being overweight or obese when compared to the category of "Physical Activity 300+ min/wk".
Data Source: 2009 Indiana BRFSS Data.

High school students

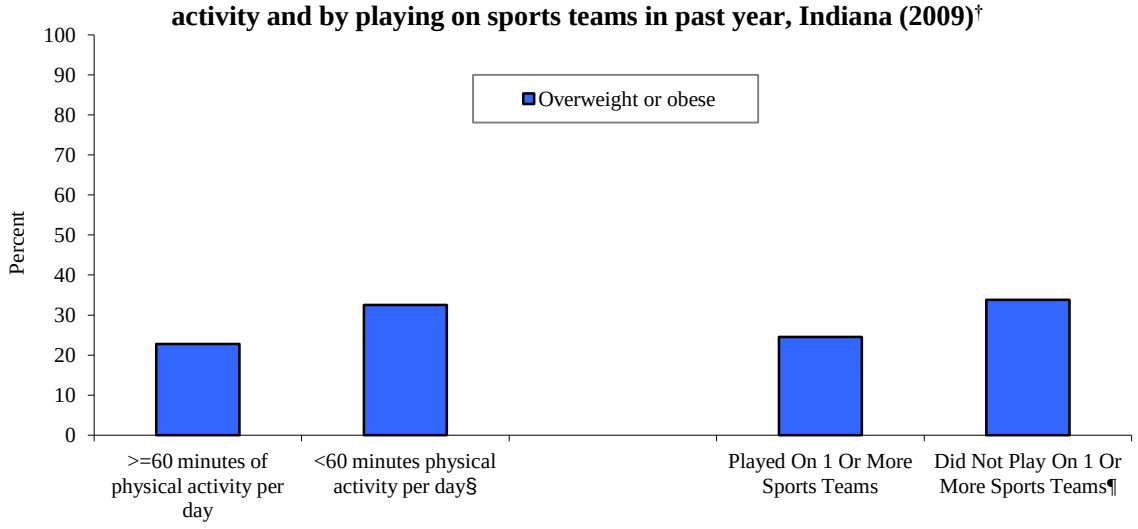
Among high school students, weight status was compared to the following demographic and behavioral variables: gender, race/ethnicity, grade level, physical activity, fruit and vegetable consumption, attendance at physical education (PE) classes daily, having PE classes one or more times per week, playing on one or more sports teams, playing video games three or more hours per day, watching television three or more hours per day and drinking soda one or more times per day. Three variables were found to be strongly related to weight status: physical activity, playing on sports teams and watching television. Slightly related to weight status were race/ethnicity and grade level. Appendix K contains numbers, percentages, and statistical results of all these variables.

Weight status, physical activity, and sports team participation in high school students

Students who reported having 60 or more minutes of physical activity per day were less likely to be considered overweight or obese compared to those who reported inadequate physical activity. Of students who reported inadequate physical activity, 33% were considered to be overweight/obese, while only 23% of those who reported adequate physical activity were considered overweight or obese. Students who participated on at least one sports team in the past year were less likely to be considered overweight/obese than those who did not participate. Of those who participated on at least 1 sports team in the past year, only 25% were considered to be overweight or obese, while 34% of those not on a sports team in the past year were considered overweight or obese (2) (Figure 23).

Figure 23.

Percent of high school students who are overweight or obese* by physical activity and by playing on sports teams in past year, Indiana (2009)†

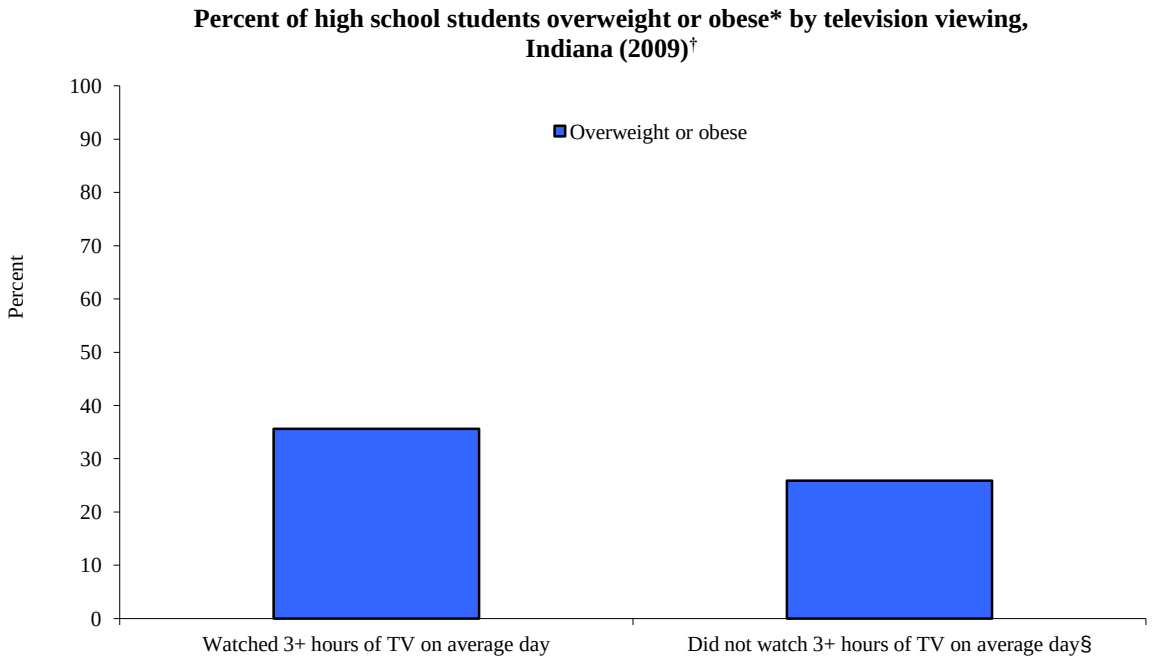


*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for high school students in grades 9-12.
§Category is strongly related to being overweight or obese when compared to the category of "≥60 minutes of physical activity per day".
¶Category is strongly related to being overweight or obese when compared to the category of "Played on 1 or more sports teams".
Data Source: 2009 Indiana YRBS Data.

Weight status and television viewing in high school students

Students who watched less than three hours of television daily were less likely to be considered overweight or obese compared to those who reported watching three or more hours of television daily. Of those who were considered to be overweight or obese, 36% reported watching television three or more hours per day, while only 26% of those reporting watching less than three hours were in that category (2) (Figure 24).

Figure 24.



*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for high school students in grades 9-12.
§Category is strongly related to being overweight or obese when compared to the category of "Watched 3+ hours of TV on average day."
Data Source: 2009 Indiana YRBS Data.

Youth ages 10-17

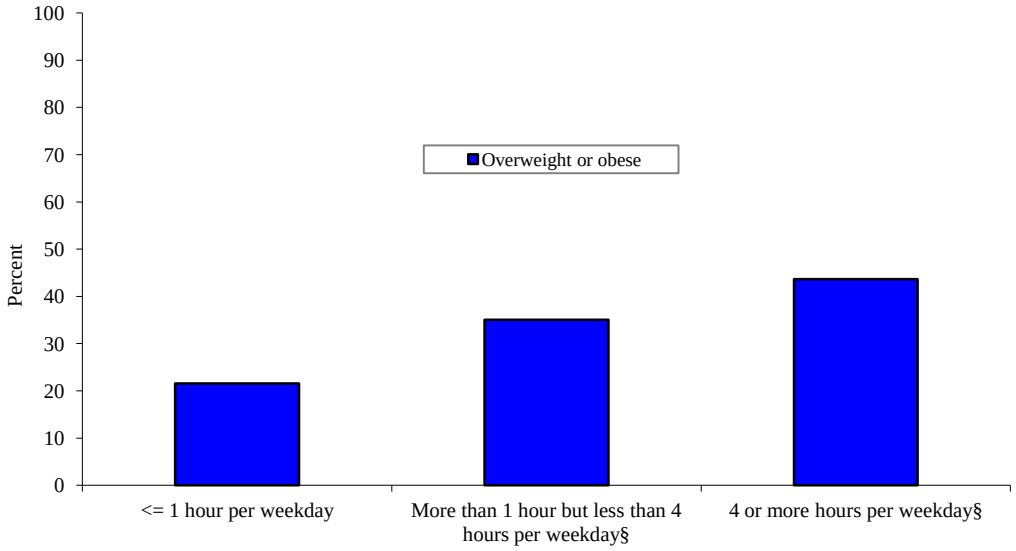
From the 2007 National Survey of Children's Health (NSCH), weight status was compared to the demographic and behavioral variables of gender, race, age, physical activity, video game playing or television watching. Also, family structure, missed school due to illness or injury, health care access, having consistent health care, type of insurance, living in a working poor household and poverty level. The variable most strongly related to weight status was video game playing or watching television. Found to have a slight relationship to weight status was family structure, missing school 11+ days, having public health insurance, and a Federal Poverty Level (FPL) 400% or more.

Weight status, television watching, and video game playing among youth

Children ages 6-17 who watched or played more than one hour but less than four hours per weekday of television or video games (35%) and those who watched or played four hours or more per weekday (44%) were more likely to be considered overweight or obese than those watching television or playing video games less than or equal to one hour (22%) (3) (Figure 25).

Figure 25.

Percent of youth who are overweight or obese* by watching television and playing video games, Indiana (2007)†



*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for children ages 6-17.
§Category is strongly related to being overweight or obese when compared to the category of "≤1 hour per weekday".
Data Source: 2007 NSCH Data.

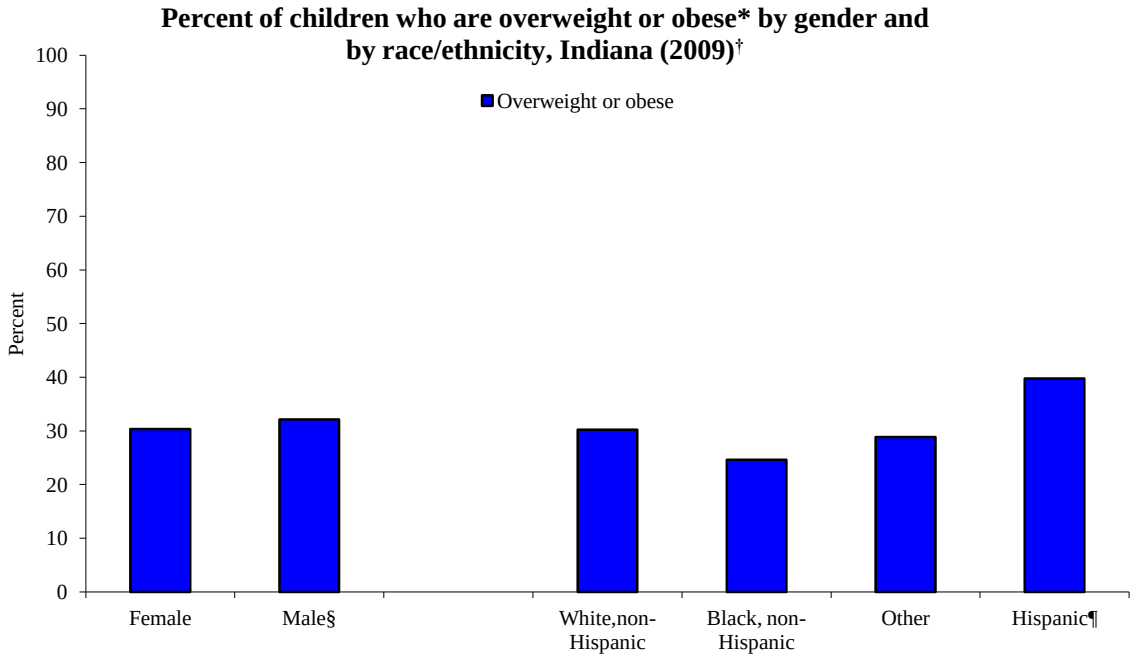
Children ages 2 to <5 years

Selected demographic and behavioral variables of children participating in WIC were analyzed for their relationship with weight status. These variables were: gender; race; age; receiving food stamps, Medicaid, or Temporary Assistance for Needy Families (TANF); percent poverty level; and television viewing. Those variables strongly related to weight status included gender, race/ethnicity, age, Medicaid status, percent poverty level and television viewing. Specific percentages and comparisons are displayed below.

Weight status, gender, and race/ethnicity of children

Gender was strongly related to being overweight or obese. Males were more likely to be in the overweight or obese category when compared to females. For males, 32% were considered to be overweight or obese compared to 30% of females. Race/Ethnicity and weight status were also strongly related. When compared to white, non-Hispanics, the weight status of blacks and Hispanics was strongly related. Blacks were less likely considered to be overweight or obese (25%) when compared to white, non-Hispanic (30%). However, Hispanics were more likely considered to be overweight or obese (40%) when compared to white, non-Hispanics (12) (Figure 26).

Figure 26.



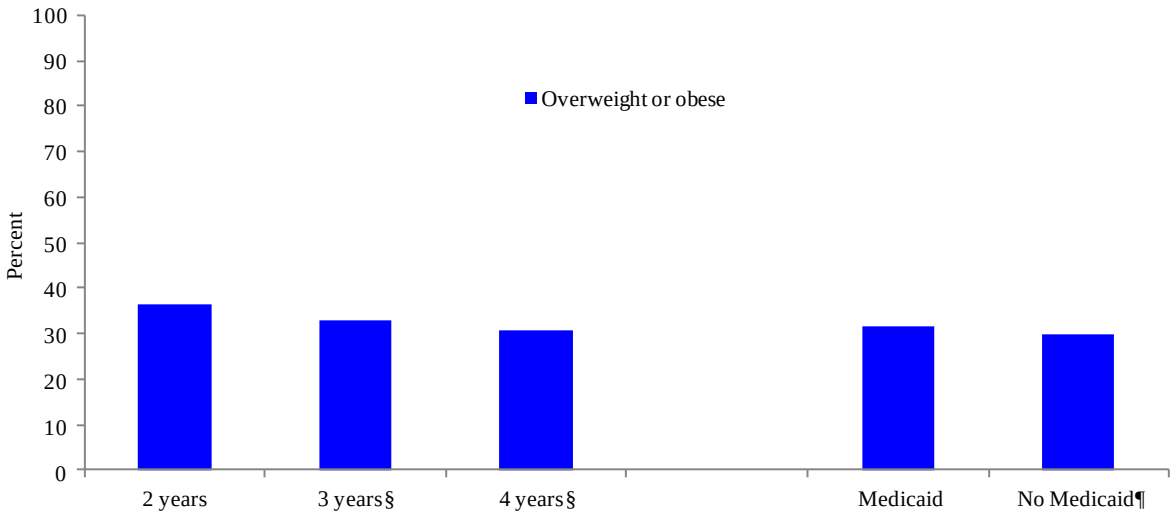
*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for children ages 2 to <5 years.
§Category is strongly related to overweight and obesity when compared to the category "Female".
¶Category is strongly related to overweight and obesity when compared to the category "White, non-Hispanic".
Data Source: 2009 PedNSS Data.

Weight status, age, and Medicaid status of children

Age and Medicaid status were strongly related to weight status. Children ages 3 and 4 were more likely to be considered overweight or obese when compared to 2-year-olds. Of these children, 36% of those age 2, 33% of those age 3, and 31% of those age 4 were considered to be overweight or obese. For Medicaid, children without Medicaid were less likely to be considered overweight or obese compared to children with Medicaid. For those without Medicaid, 30% were considered to be overweight or obese, with 32% of those with Medicaid in that category (12) (Figure 27).

Figure 27.

Percent of children who are overweight or obese by age and by Medicaid status, Indiana (2009) †

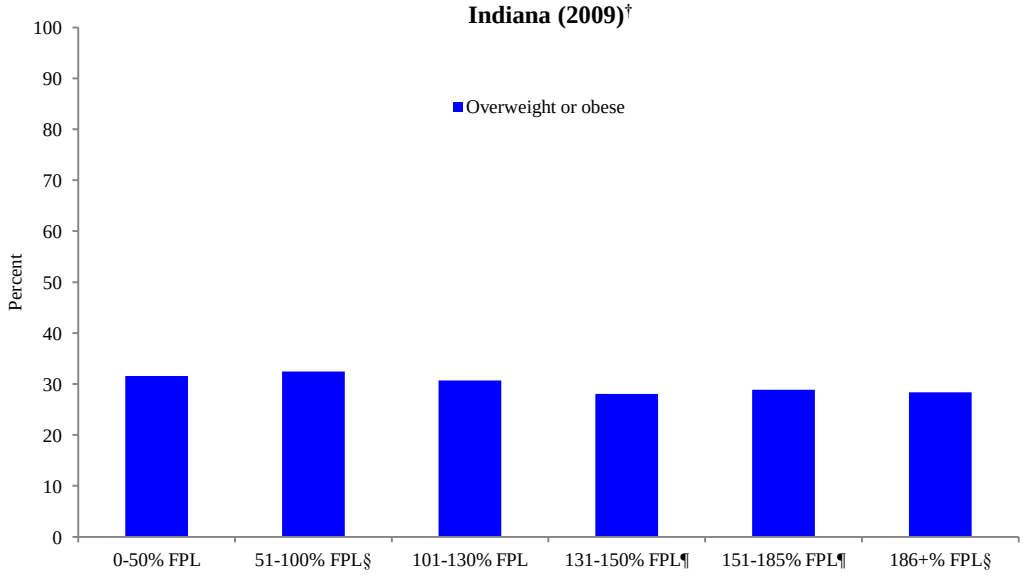


*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for children ages 2 to <5 years.
§Category is strongly related to overweight and obesity when compared to the category "2 years".
¶Category is strongly related to overweight and obesity when compared to the category "Medicaid".
Data Source: 2009 PedNSS Data.

Weight status and poverty level of children

Children living at 131-150 and 151-185 percent FPL were strongly related to being overweight or obese. These children were less likely to be considered overweight or obese when compared to children living at 0-50 percent FPL. Twenty-eight percent of children living at 131-150 percent FPL and 29% of children living at 151-185 were considered to be overweight or obese compared to 32% of those living at 0-50 percent FPL. Slightly related to being overweight and obese were children living at 51-100 percent FPL (33%) and 186+ percent FPL (28%). These children were slightly more likely to be considered overweight or obese when compared to those living at 0-50 percent FPL (12). (Figure 28).

Figure 28. **Percent of children who are overweight or obese* by percent poverty level, Indiana (2009)†**



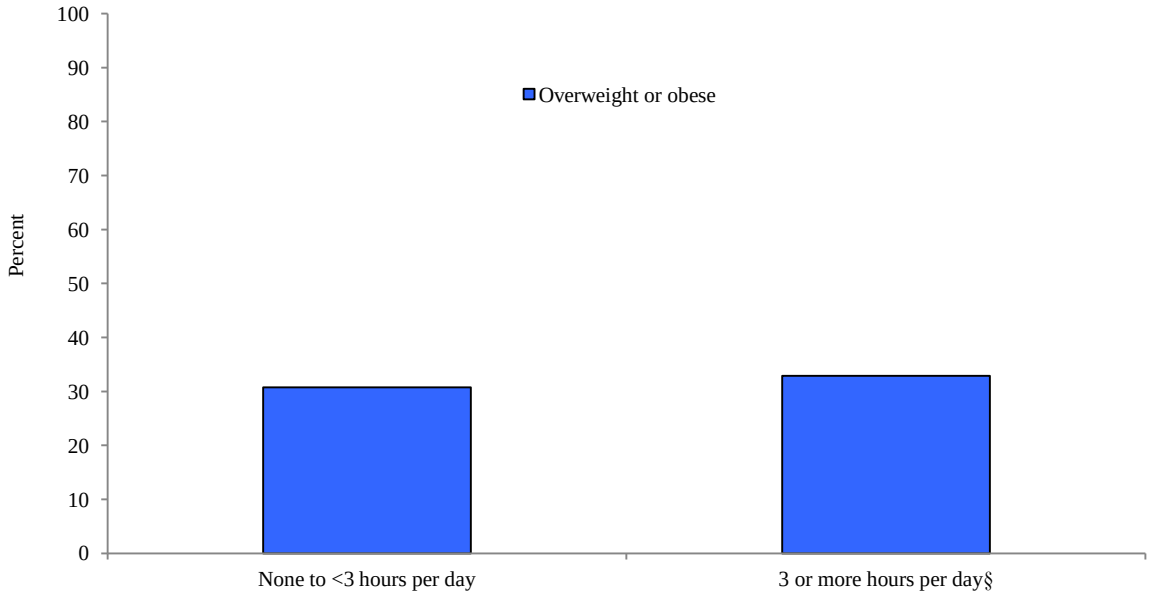
*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for children ages 2 to <5 years.
§Category is slightly related to overweight and obesity when compared to the category "0-50 percent FPL".
¶Category is strongly related to overweight and obesity when compared to the category "0-50 percent FPL".
Data Source: 2009 Indiana PedNSS Data.

Weight status and television viewing of children

Television viewing was strongly related to weight status. Children watching television three or more hours per day were more likely to be considered overweight or obese when compared to children who watched no television to less than three hours per day. Thirty-three percent of children who watched three or more hours of television per day were considered to be overweight or obese compared to 31% of children who watched no television to less than three hours per day (12) (Figure 29).

Figure 29.

Percent of children who are overweight or obese* by television viewing, Indiana (2009)†



*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
†Data are for children ages 2 to <5 years.
§Category is strongly related to overweight and obesity when compared to the category "None to <3 hours per day".
Data Source: 2009 PedNSS Data.

Risk Factors

While a variety of risk factors exist that contribute to overweight and obesity, there are very few for which data are available to allow comparisons to the weight status of Indiana's population. Having the needed data is critical to defining potential interventions to combat the obesity epidemic. Identification of demographic groups experiencing a disproportionate share of overweight and obesity determines potential target groups for interventions. Data surveillance systems available for Indiana allowed for exploring two of these risk factors, physical activity and consumption of fruits and vegetables and their relationship to obesity more extensively.

Physical Activity Levels

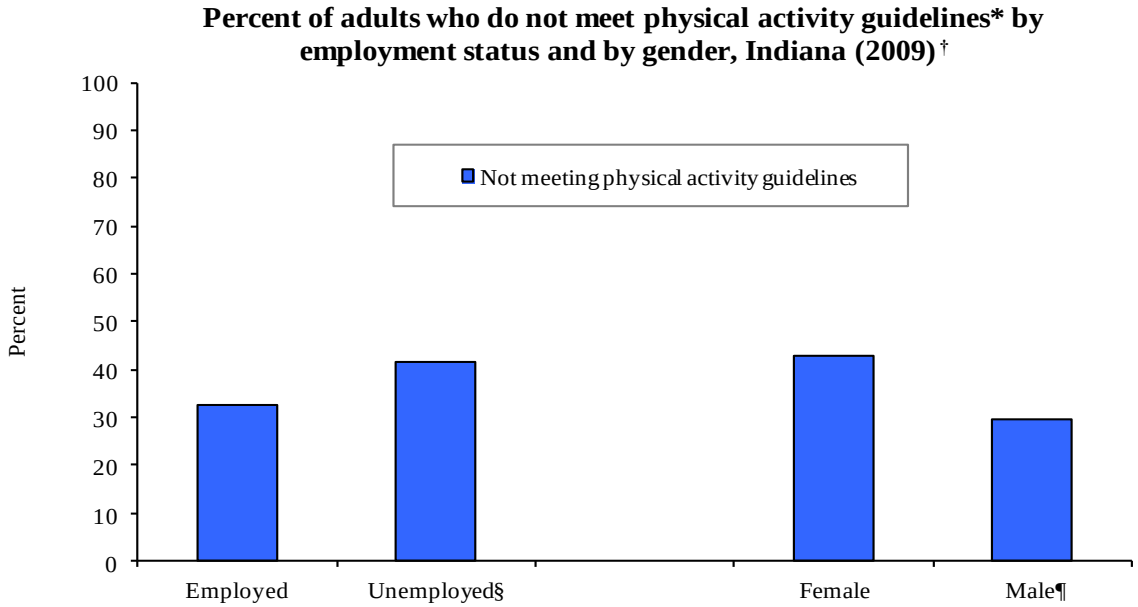
Adults

Disparities among Indiana adults and their physical activity levels were determined by using data from Indiana's Behavioral Risk Factor Surveillance Survey (BRFSS) (Appendix I). Demographic and behavioral variables compared to obtaining physical activity at the recommended levels included marital status, employment status, gender, race/ethnicity, age, education, income and health insurance. Five variables were strongly related to physical activity: employment status, gender, age, education level and income. Appendix H contains numbers, percentages and statistical results for all of the variables. Specific percentages and comparisons are below.

Physical activity, employment status, and gender of adults

When compared to the employed, unemployed individuals were less likely to meet physical activity guidelines. In addition, more females than males did not meet physical activity guidelines (1) (Figure 30).

Figure 30.

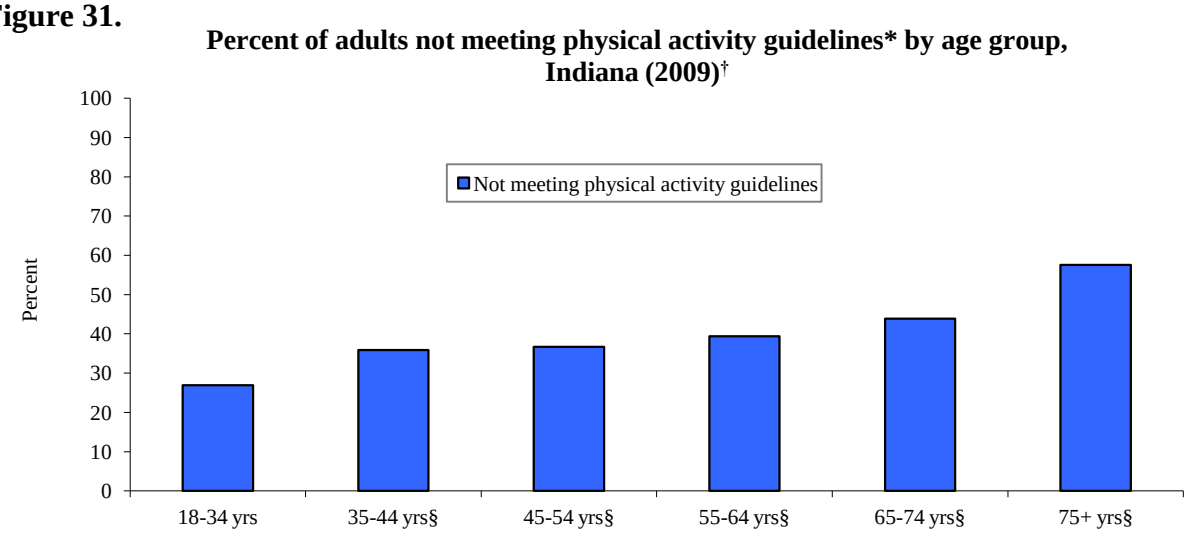


*Moderate-intensity exercise for at least 150 minutes/week or 75 minutes/week of vigorous-intensity exercise or an equivalent combination.
†Data are for adults ages 18 years and older.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "Employed".
¶Category is strongly related to not meeting physical activity guidelines when compared to the category of "Female".
Data Source: 2009 Indiana BRFSS Data.

Physical activity and age of adults

All other age groups were more likely to report inadequate physical activity when compared to those in the 18-34 years age group. Percent of adults not meeting physical activity guidelines are as follows: 18-34 years, 27%; 35-44 years, 36%; 45-54 years, 37%; 55-64 years, 39%; 65-74 years, 44%; 75 years or older, 58% (1) (Figure 31).

Figure 31.

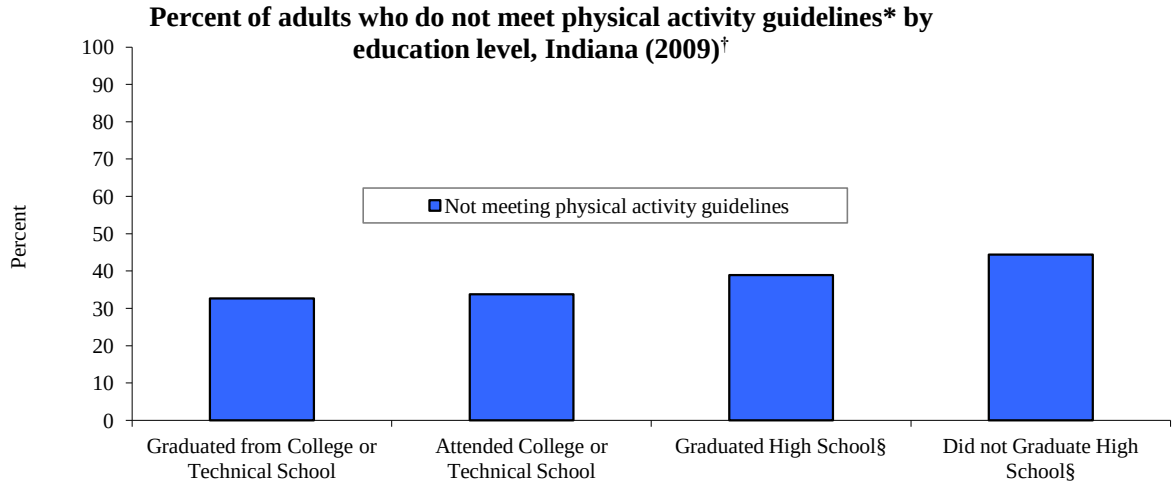


*Moderate intensity exercise for at least 150 minutes/week or 75 minutes/week of vigorous intensity exercise or an equivalent combination.
†Data are for adults ages 18 years and older.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "18-34 yrs".
Data Source: 2009 Indiana BRFSS Data.

Physical activity and education level of adults

Strongly related to physical activity was education level. When compared to those who graduated from college or technical school, those with high school education or below were less likely to meet the recommended levels of physical activity. Among high school graduates, 39% reported 0-149 minutes of physical activity per week, while 44% of those who did not graduate high school reported 0-149 minutes per week. Only 33% of college or technical school graduates reported 0-149 minutes of physical activity per week (1) (Figure 32).

Figure 32.

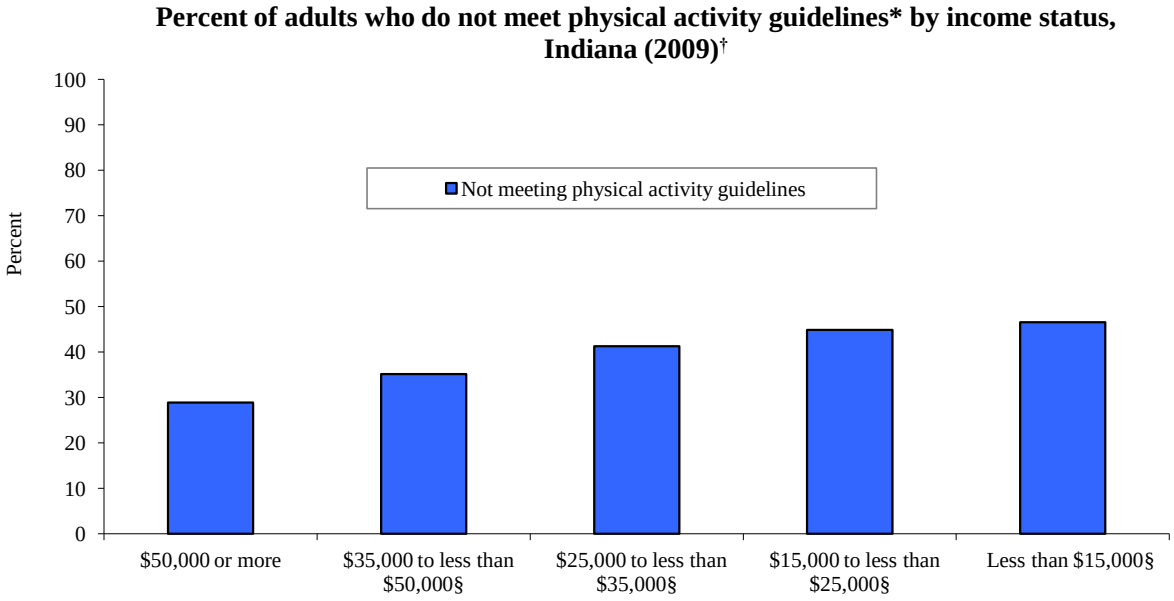


*Moderate-intensity exercise for at least 150 minutes/week or 75 minutes/week of vigorous-intensity exercise or an equivalent combination.
†Data are for adults ages 18 years and older.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "Graduated from College or Technical School".
Data Source: 2009 Indiana BRFSS Data.

Physical activity and income status of adults

When compared to those with household incomes of $50,000 or more per year, all other income categories were less likely to meet the recommended levels of physical activity per week. The numbers reveal that the lower an individual's income status, the greater the likelihood of not meeting the recommended levels of physical activity: for those in households earning $35,000-$49,999, 35%; for those in households earning $25,000-$34,999, 41%; for those in households earning $15,000-$24,999, 45%; and for those in households earning less than $15,000, 47% (Figure 33).

Figure 33.



*Moderate-intensity exercise for at least 150 minutes/week or 75 minutes/week of vigorous-intensity exercise or an equivalent combination.
†Data are for residents ages 18 years and older.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "$50,000 or more".
Data Source: 2009 Indiana BRFSS Data.

High school students

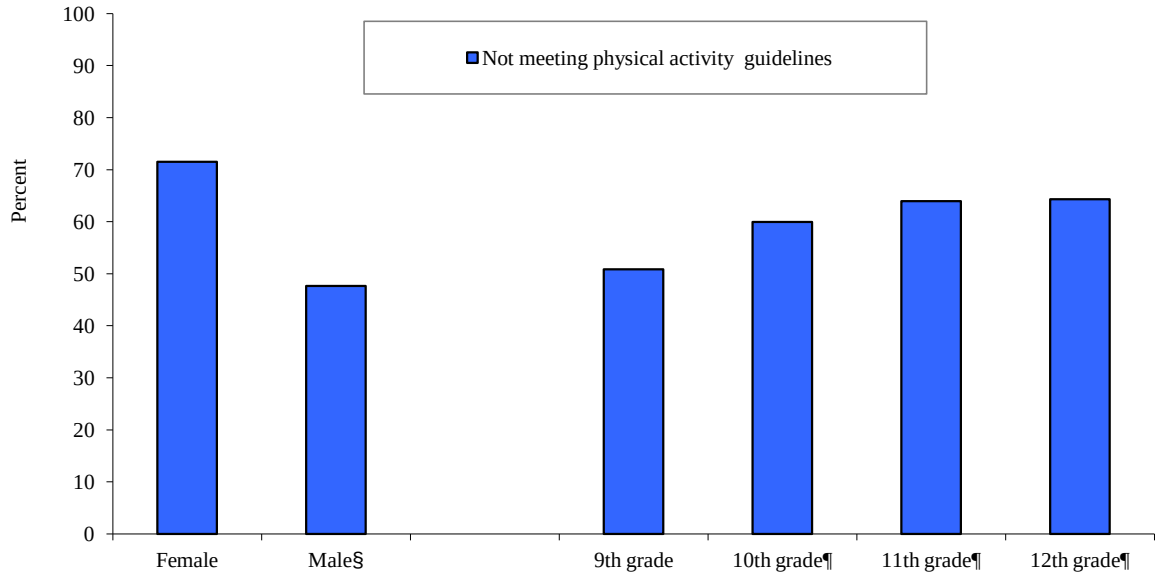
Additional disparities among Indiana high school students and their physical activity levels were determined by using data from Indiana's Youth Risk Behavior Survey (YRBS) (Appendix L). The following variables were compared to meeting physical activity at the recommended levels: gender, race/ethnicity, grade, attending physical education (PE) classes daily, having PE class one or more days per week, playing on one or more sports teams, playing video games three or more hours per day, and watching television three or more hours per day. Six variables strongly related to physical activity included: gender, attending PE class daily, having PE class one or more days per week, playing on one or more sports teams, playing video games three or more hours per day, and watching television three or more hours daily. Slightly related were race (blacks more likely than white, non-Hispanics to report inadequate physical activity) and grade level (10^{th}, 11^{th} and 12^{th} graders more likely than 9^{th} graders to report inadequate physical activity).

Physical activity, gender, and grade level of high school students

Physical activity and grade levels 10 and 11 were only slightly related, while grade 12 showed a stronger relationship. Males were *less* likely to report not meeting physical activity guidelines than females. Of male students, 48% reported physical activity that did not meet guidelines compared to 72% of female students. Students in grade levels 10, 11, and 12 were more likely to report not meeting physical activity guidelines than students in grade 9. Of those in the 9^{th} grade, 51% reported not meeting physical activity guidelines, while 60% of those in the 10^{th} grade, 64% of those in the 11^{th} grade, and 64% of those in the 12^{th} grade reported not meeting the guidelines (Figure 34).

– **Figure 34.**

Percent of high school students who do not meet physical activity guidelines* by gender and by grade level, Indiana (2009)†



*Percentage of students who were not physically active for a total of at least 60 minutes per day on 5 or more of the past 7 days.
†Data are for high school students in grades 9-12.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "Female".
¶Category is slightly related to not meeting physical activity guidelines when compared to the category of "9^{th} Grade".
Data Source: 2009 Indiana YRBS Data.

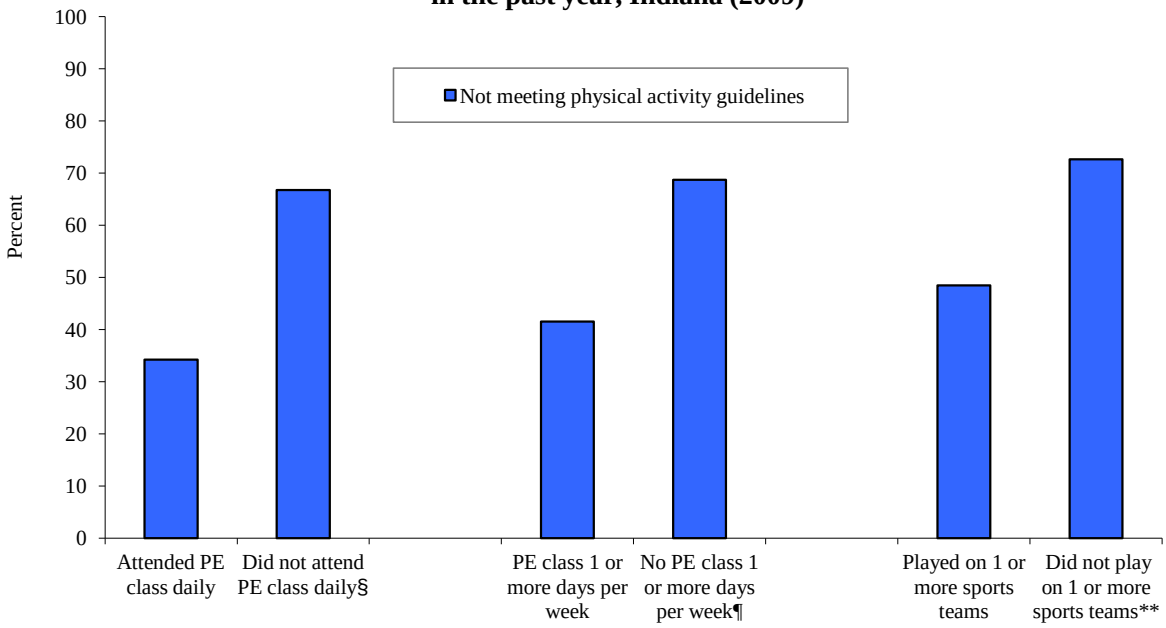
Physical activity, physical education class, and sports team participation of high school students

High school students who *did not* attend physical education (PE) class daily were more likely to report inadequate physical activity. For these students, 67% reported having inadequate physical activity compared to only 34% of those who reported attending PE class daily. Of those who did not have PE class one or more times per week, 69% reported inadequate physical activity, while only 42% of those who did have PE class one or more times per week reported inadequate physical activity.

Also strongly related to physical activity was participation on one or more sports teams. Students were more likely to report inadequate physical activity if they reported *not* playing on one or more sports teams. Of those reporting not playing on a sports team, 73% reported inadequate physical activity, while 49% of those playing on a sports team reported inadequate physical activity (Figure 35).

Figure 35.

Percent of high school students who do not meet physical activity guidelines* by participation in physical education class and by playing on sports teams in the past year, Indiana (2009)†

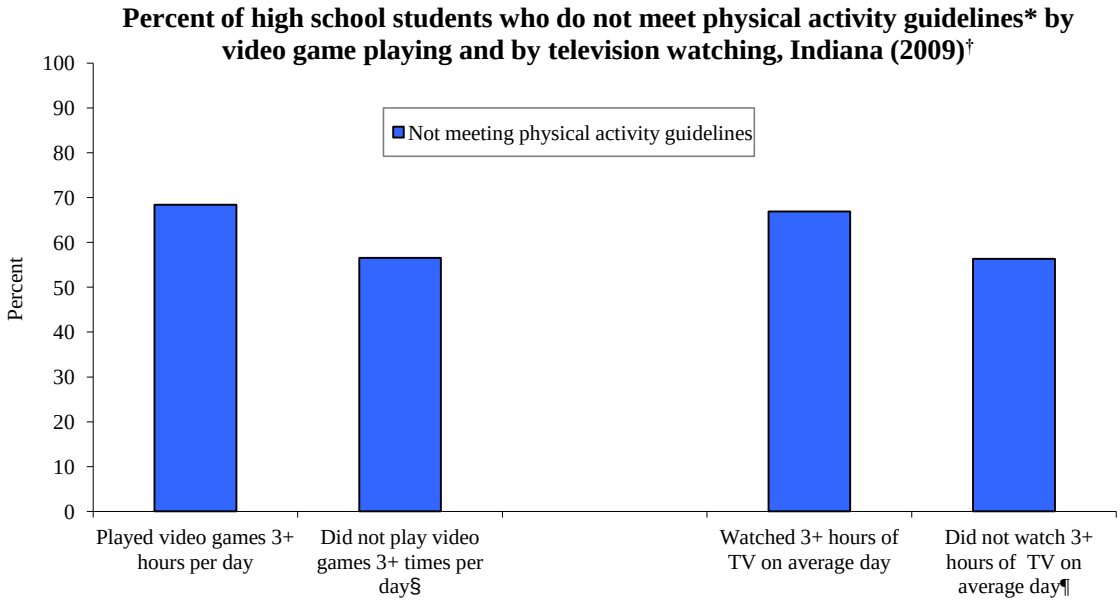


*Percentage of students who were not physically active for a total of at least 60 minutes per day on 5 or more of the past 7 days.
†Data are for high school students in grades 9-12.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "Attended PE class daily".
¶Category is strongly related to not meeting physical activity guidelines when compared to the category of "PE class 1 or more days per week".
**Category is strongly related to not meeting physical activity guidelines when compared to the category of "Played on 1 or more sports teams".
Data Source: 2009 Indiana YRBS Data.

Physical activity, video games, and television viewing of high school students

Those students who played video games three or more hours per day were more likely to report inadequate physical activity than those who did not. Of those reporting playing video games three or more hours per day, 68% reported inadequate physical activity compared to 57% of those who did not report doing so. In addition to video game playing, television viewing was strongly related to physical activity. Students who viewed three or more hours of television daily were more likely to report inadequate physical activity than those who did not. Of those who watched three or more hours of TV per day, 67% reported inadequate physical activity compared to 56% of those who did not report doing so (Figure 36).

Figure 36.



*Percentage of students who were not physically active for a total of at least 60 minutes per day on 5 or more of the past 7 days.
†Data are for high school students in grades 9-12.
§Category is strongly related to not meeting physical activity guidelines when compared to the category of "Played video games 3+ hours per day".
¶Category is strongly related to not meeting physical activity guidelines when compared to the category of "Watched 3+ hours of TV on average day".
Data Source: 2009 Indiana YRBS Data.

Youth ages 10-17 years

The same demographic and behavioral variables reviewed for weight status were then compared to physical activity status to see if there were any related to getting adequate physical activity 4-7 days per week versus 0-3 days per week. Although no variables were strongly related, there were a few slightly related to getting only 0-3 days of adequate physical activity per week:

- **Gender:** Males (32%) were less likely to get adequate physical activity only 0-3 days per week when compared to females (42%).
- **Poverty:** Children living at 200-399% FPL (30%) were less likely to get physical activity only 0-3 days per week when compared to children living at <100% FPL (45%).

Fruit and Vegetable Consumption

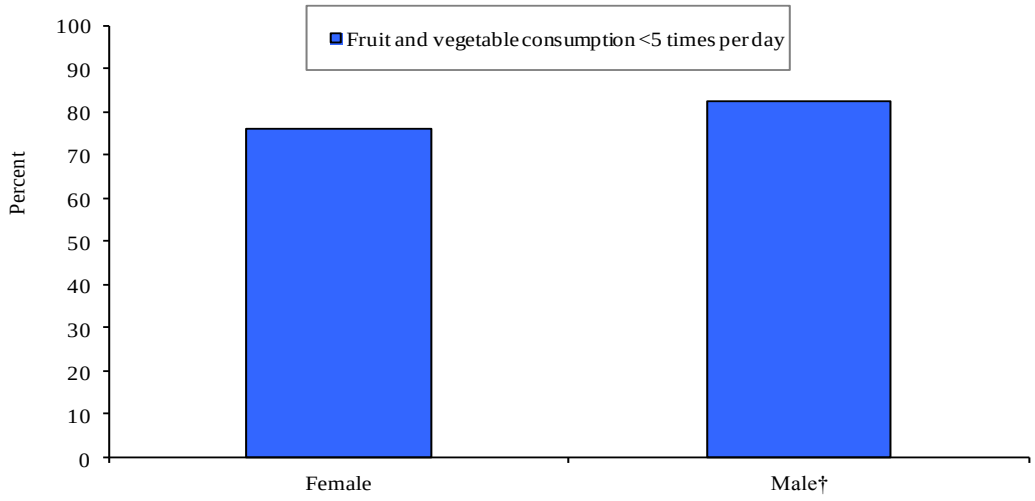
Adults

Additional disparities among adults and fruit and vegetable consumption levels were determined by using data from Indiana's Behavioral Risk Factor Surveillance System (1). The following variables were compared to consuming fruits and vegetables five or more times per day: marital status, employment status, gender, race/ethnicity, age, education, income, and health insurance. Variables strongly related to fruit and vegetable consumption were gender (males more likely than females to consume less than five a day) and education (those who did not graduate or attend college or technical school were more likely to consume less than five servings a day).

Fruit and vegetable consumption and gender

Males were more likely than females to consume fruits and vegetables *less than* five times per day. For females, 76% reported consuming fruit and vegetables less than 5 times per day, compared to 83% of males (Figure 37).

Figure 37. **Percent of adult consumption of fruits and vegetables, less than five times per day by gender, Indiana (2009)***

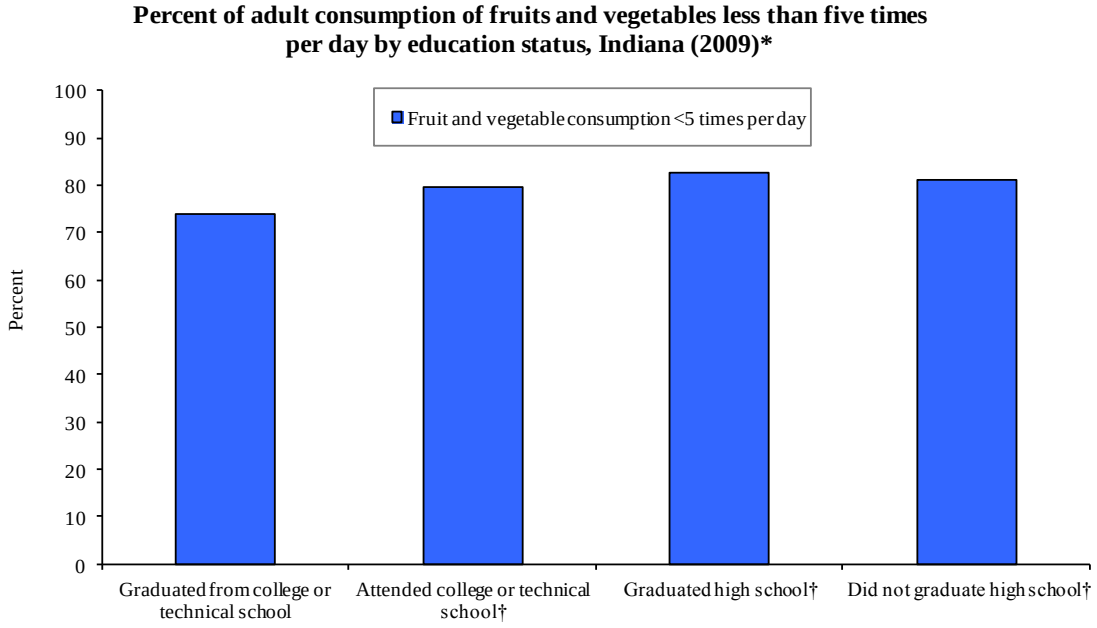


*Data are for residents ages 18 years and older.
†Category is strongly related to fruit and vegetable consumption <5 times per day when compared to the category of "Female".
Data Source: 2009 Indiana BRFSS Data.

Fruit and vegetable consumption and education level of adults

When compared to adults who have graduated from college or technical school**,** adults in all other education levels were less likely to consume fruits and vegetables five times or more per day. Of those who graduated from college or technical school, 74% reported consuming fruits and vegetables less than five times per day, compared to 80% of those who attended college or technical school, 83% of those who graduated from high school, and 81% of those who did not graduate from high school (Figure 38).

Figure 38.



*Data are for residents ages 18 years and older.
†Category strongly related to fruit and vegetable consumption <5 times per day when compared to the category of "Graduated from college or technical school".
Data Source: 2009 Indiana BRFSS Data.

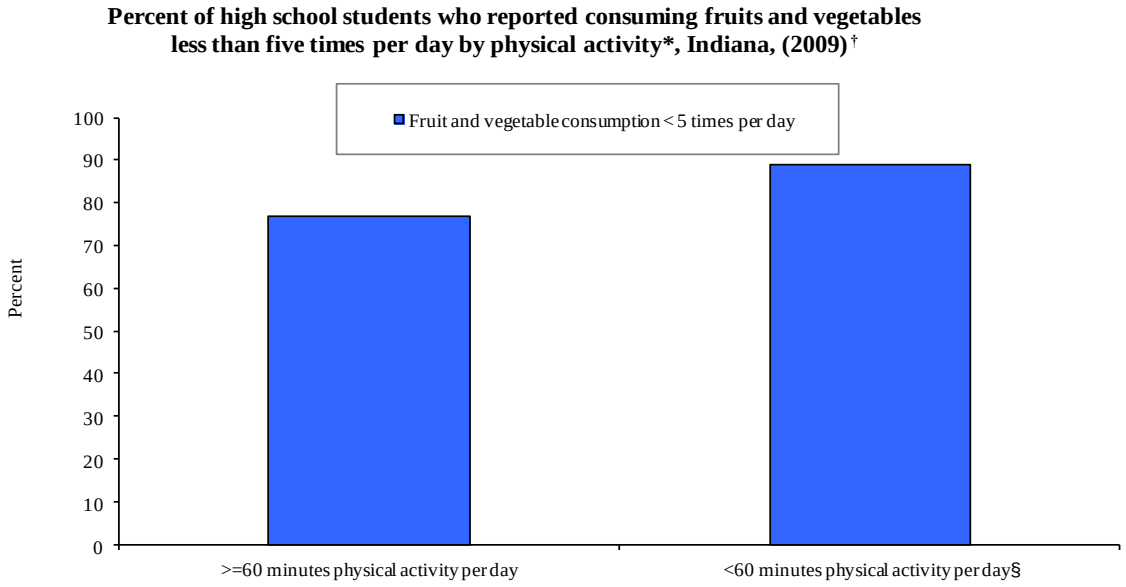
High school students

Additional disparities among Indiana high school students and their fruit and vegetable consumption were determined by using data from Indiana's YRBS. The following variables were compared to fruit and vegetable consumption: gender, race/ethnicity, grade, physical activity, attending PE classes daily, having PE class one or more days per week, playing on one or more sports teams, playing video games three or more hours per day, watching television three or more hours per day and drinking soda one or more times per day. Physical activity was the only variable strongly related to fruit and vegetable consumption. Slightly related to consuming fruits and vegetables less than five times per day were grade level (12^{th} graders more likely than 9^{th} graders to consume less than five a day) and participation on one or more sports teams (those not participating more likely to consume less than five a day).

Fruit and vegetable consumption and physical activity of high school students

Of those high school students who reported meeting the recommended amounts of physical activity, 77% reported consuming less than five servings of fruit and vegetables daily, compared to 89% of those who reported not meeting the recommended amounts of physical activity (2) (Figure 39).

Figure 39.



*Percentage of students who were not physically active for a total of at least 60 minutes per day on 5 or more of the past 7 days.
†Data are for high school students in grades 9-12.
§Category is strongly related to fruit and vegetable consumption less than 5 times per day when compared to the category of "≥60 minutes physical activity per day".
Data Source: 2009 Indiana YRBS Data.

Fruit and vegetable consumption and sports team participation of high school students

Students who did not play on one or more sports teams were more likely to report consuming fruits and vegetables less than five times a day (87%) than were students who did play on one or more sports teams (82%) (2).

Health Interventions

Three areas traditionally categorize weight loss interventions for individuals. These are diet, physical activity, and behavior therapy (5). However, a person's social and physical environment also plays a role in one's ability to establish and/or maintain a healthy weight and overall good health. Therefore, a multitude of interventions at many levels of influence should occur. The Socio-ecological Model provides a framework for addressing interventions targeted at reducing overweight and obesity among all levels of influence (societal, community, organizational, interpersonal, and individual) (4) (Appendix Q).

Individual behaviors that can be modified include (9):

- Reducing consumption of sodas and juices with added sugars.
- Reducing consumption of energy-dense foods that primarily contain added sugars or solid fats.
- Eating more fruits, vegetables, whole grains, and lean proteins.
- Controlling portion sizes.
- Drinking more water.
- Choosing low-fat or non-fat dairy products.
- Limiting television viewing time and consider keeping televisions out of children's rooms.
- Becoming more physically active throughout the day.
- Breastfeeding exclusively to six months.

Ideally, population-based, sustainable approaches for changing the weight status, diet, and physical activity of people should include creating environments, policies, and practices that support increases in physical activity and improvements in diet, especially among those disproportionately affected by poor health. Interventions should go beyond people acquiring new knowledge and allow people to build the skills and practice the behaviors leading to a healthy weight. Supportive environments are necessary to sustain healthy behaviors. In addition, assessment of a targeted audience's needs, barriers, and goals along with intervention strategies shown to produce results can provide optimal outcomes (4).

What Is the ISDH Doing?

A key milestone in Indiana's efforts to improve health outcomes was the launch of Governor Mitch Daniels' health initiative, INShape Indiana (INShape), in July 2005. INShape began with a website to provide Indiana residents with information on nutrition, physical activity and tobacco cessation to help them engage in healthier behaviors. More than 86,000 Indiana residents have registered online to receive health tips and information from INShape. The initiative has also hosted several health summits and, in collaboration with partners, initiated several programs and competitions, including joining Anthem and Kroger to create the "Indiana Worksite Wellness Partnership." While INShape focuses on individual behavior change, it has also inspired programs and activities aimed at motivating entire communities to help make the healthy choice the easier choice. The strength of INShape Indiana lies in the many partnerships it has created or inspired over the years. INShape will continue to motivate, educate and connect Hoosiers to valuable resources that help them eat better, move more and avoid tobacco.

In 2008, the Indiana State Department of Health (ISDH) established the Division of Nutrition and Physical Activity (DNPA). Building on the state's previous efforts while creating new partnerships, the Indiana Healthy Weight Initiative (IHWI) Task Force was established. The Task Force is a diverse group of stakeholders positioned throughout Indiana, representing nutrition, physical activity, transportation, academics, business, professional organizations, and state and local governments. Since December of 2008, the Task Force has worked to develop *Indiana's Comprehensive Nutrition and Physical Activity Plan, 2010-2020,* and to create the infrastructure to support the Plan's implementation and evaluation. Using professional and personal resources and the Initiative's speakers bureau and Website, the Task Force and a growing network of additional partners have developed the framework for objectives across all sectors of Indiana to address poor nutrition, sedentary behaviors, and obesity with an intensity and reach never seen before in Indiana.

The ultimate purpose of the Plan, the work of the Indiana Healthy Weight Initiative, and other partners is to achieve six goals:

- Increase access to and consumption of healthy foods and beverages.
- Increase opportunities for and engagement in regular physical activity.
- Increase efforts aimed at enabling people to achieve and maintain a healthy weight across the lifespan.
- Reduce environmental and policy-related disparities for breastfeeding, nutrition, physical activity, overweight, obesity and chronic disease.
- Increase the capacity of communities and settings within those communities (e.g., schools, worksites, faith-based organizations, etc.) to develop and sustain environmental and policy support systems that encourage healthy eating and active living.
- Increase state and local strategic partnerships to more effectively coordinate efforts, share resources, and identify and reach priority populations.

To review objectives and strategies to help achieve these goals, access the Plan on the Indiana Healthy Weight Initiative Website at www.inhealthyweight.org.

Conclusion

Overweight, obesity, and their risk factors affect some demographic groups more than others. This is evident in Indiana from the results of data analyses presented in this report. When compared to other groups, the groups listed below were found to be at highest risk for overweight and obesity, poor physical activity, and consuming less than five servings of fruit and vegetables daily. While there are other groups who were determined to have high risk, the groups below are in the most need of intervention. They are the best target groups for community interventions around improving the weight status, physical activity levels, and fruit and vegetable consumption of individuals in Indiana.

Highest Risk of Overweight or Obesity

Adults who are one of the following:

- Married
- Men
- 35-74 years of age
- Not engaging in 300 or more minutes of physical activity per week

High school students who have one of the following:

- Less than 60 minutes of physical activity per day
- Not played on one or more sports teams in the past year
- Viewed television three or more hours per day

Youth ages 10 to 17 who have:

- Played video games or watched television/videos 1 or more hours per weekday

Children aged 2 to <5 years receiving WIC support who are one of the following:

- Male
- Black or Hispanic
- 3 or 4 years of age
- Receiving Medicaid
- At 131-150% FPL
- Watching television 3 or more hours per day

Highest Risk of Physical Activity Levels below Recommended Amounts

Adults who are one of the following:

- Unemployed
- Female
- Over the age of 34
- A high school graduate or did not graduate from high school
- Earning less than $50,000 per year

High school students who are one of the following:

- Female
- Watching television three or more hours per day
- In grades 10-12
- Not attending PE class daily
- Not playing on one or more sports teams
- Playing video games three or more hours per day

Highest Risk of Fruit and Vegetable Consumption Less than Five Times per Day

Adults who are one of the following:

- Male
- High school graduates

High school students who:

- Report inadequate physical activity

Overall, Indiana must accelerate statewide efforts aimed at eliminating risk factors leading to overweight and obesity and decreasing the prevalence of the condition itself. *Indiana's Comprehensive Nutrition and Physical Activity Plan, 2010-2020*, outlines the goals and objectives for individuals and organizations to undertake in order to reduce overweight and obesity in Indiana.

Find it at:
http://www.inhealthyweight.org/files/IN_State_Obesity_Plan_2010-2020.pdf

Vision, Mission and Goals

Vision

- All Hoosiers practice and enjoy a lifestyle of healthy eating and physical activity within an environment that supports health, wellness and vitality.

Mission

- To enhance the health and quality of life of Hoosiers by promoting good nutrition, regular physical activity and a healthy weight through policy, environment and lifestyle change.

Goals

- Increase access to and consumption of healthy foods and beverages.
- Increase opportunities for and engagement in regular physical activity.
- Increase efforts aimed at enabling people to achieve and maintain a healthy weight across the lifespan.
- Reduce environmental and policy-related disparities for breastfeeding, nutrition, physical activity, overweight, obesity, and chronic disease.
- Increase the capacity of communities and the settings within those communities (e.g., schools, worksites, faith-based organizations, etc.) to develop and sustain environmental and policy support systems that encourage healthy eating and active living.
- Increase state and local strategic partnerships to more effectively coordinate efforts, share resources, and identify and reach priority populations.

Resources

The following organizations provide information on how to improve the weight status of individuals and specific populations in different settings. *(Please note that this listing is not inclusive.)*

Physical Activity

2008 Physical Activity Guidelines for Americans
This website details the U.S. Department of Health and Human Services 2008 Physical Activity Guidelines for Americans. Find guidelines for children, adults and older adults.

American College of Sports Medicine (ACSM)
The ACSM site contains information which promotes and integrates scientific research, education, and practical applications of sports medicine and exercise science to maintain and enhance physical performance, fitness, health and quality of life.

CDC Division of Nutrition, Physical Activity and Obesity (DNPAO)
This website provides valuable information and resources on physical activity, nutrition and obesity from the Centers for Disease Control and Prevention.

Indiana Healthy Weight Initiative (IHWI)
A statewide initiative that provides resources, technical assistance, and training for statewide partners implementing and evaluating *Indiana's Comprehensive Nutrition and Physical Activity Plan, 2010-2020* (the Plan).

INShape Indiana
INShape Indiana encourages Hoosiers to eat better, move more and avoid tobacco. This website provides information about the initiative, programs and events and ways to live a healthier lifestyle.

National Coalition for Promoting Physical Activity (NCPPA)
The NCPPA is the leading force in the country promoting physical activity and fitness initiatives. This website provides resources, fact sheets and reports on physical activity.

National Physical Activity Plan
Visit this site to learn more about the National Physical Activity Plan.

National Society of Physical Activity Practitioners in Public Health (NSPAPPH)
This website provides valuable information, resources, and tools for physical activity professionals.

The President's Council on Fitness, Sports and Nutrition (PCFSN)
Volunteer citizens who advise the President through the Secretary of Health and Human Services about opportunities to develop accessible, affordable, and sustainable physical activity, fitness, sports and nutrition programs for all Americans regardless of age, background, or ability.

National Association for Sport and Physical Education (NASPE)
This website provides valuable information for physical activity professionals working in the school setting.

Nutrition

American Dietetic Association (ADA)
The ADA is the world's largest organization of food and nutrition professionals.

Association of State & Territorial Public Health Nutrition Directors (ASTPHND)
ASTPHND provides national and state leadership on food and nutrition policy, programs, and services.

CDC Division of Nutrition, Physical Activity and Obesity (DNPAO)
This website provides valuable information and resources on physical activity, nutrition, and obesity from the Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention—Breastfeeding
This website provides valuable information and resources on breastfeeding.

Centers for Disease Control and Prevention—Nutrition
CDC nutrition efforts cover a wide spectrum of related topics. Good nutrition is vital to good health, disease prevention, and essential for healthy growth and development of children and adolescents.

Fruits and Veggies—More Matters
A health initiative designed to increase consumption of fruits and vegetables to five or more servings a day to improve health of Americans.

Know Your Farmer Know Your Food
Nutrition from Farm to Table.

Let's Move
The First Lady's campaign to raise a healthier generation of children.

ChooseMyPlate.gov
ChooseMyPlate offers personalized eating plans and interactive tools to help plan/assess food choices based on the Dietary Guidelines for Americans.

Produce for Better Health (PBH)
PBH serves as your "go-to" resource for fruit and vegetable marketing and education**.**

School Nutrition Association (SNA)
Recognized as the authority on school nutrition, the SNA has been advancing the availability, quality, and acceptance of school nutrition programs as an integral part of education since 1946.

United States Department of Agriculture (USDA)
The USDA provides leadership on food, agriculture, natural resources, and related issues based on sound public policy, the best available science, and efficient management.

Indiana Healthy Weight Initiative (IHWI)
A statewide initiative that provides resources, technical assistance, and training for statewide partners implementing and evaluating *Indiana's Comprehensive Nutrition and Physical Activity Plan, 2010-2020* (the Plan).

INShape Indiana
INShape Indiana, Governor Mitch Daniels' health initiative, encourages Hoosiers to eat better, move more, and avoid tobacco. Visit this site to learn more about the initiative, programs and events, and ways to live a healthier lifestyle.

Indiana Dietetic Association (IDA)
IDA members include professionals who represent a wide range of practice areas around food and nutrition.

Indiana Nutrition Council (INC)
The Indiana Nutrition Council provides a collaborative network for the purposes of exchanging information and ideas and providing resources in support of nutritionally healthy lifestyles for the residents of Indiana.

Indiana School Nutrition Association (ISNA)
The ISNA provides professional development opportunities, promotes public awareness, and addresses legislative issues in order to provide quality nutrition programs for schools and the communities they serve.

Purdue Extension Health and Human Sciences (Nutrition Programs)
Purdue Extension provides education related to nutrition across the lifespan, from pregnancy through the golden years. Found throughout Indiana are a variety of programs of interest to many residents.

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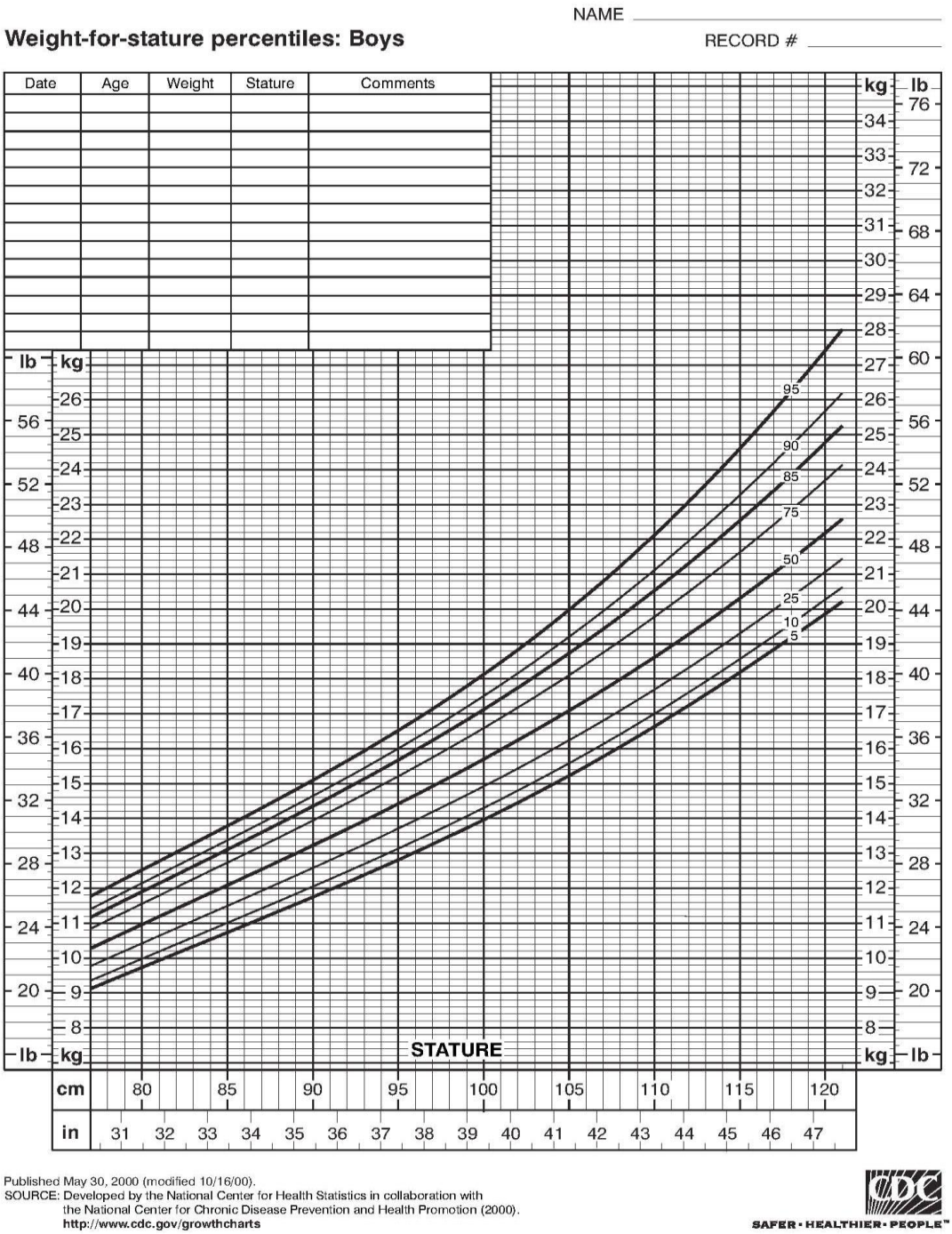
Appendix A. Weight-for-stature percentiles

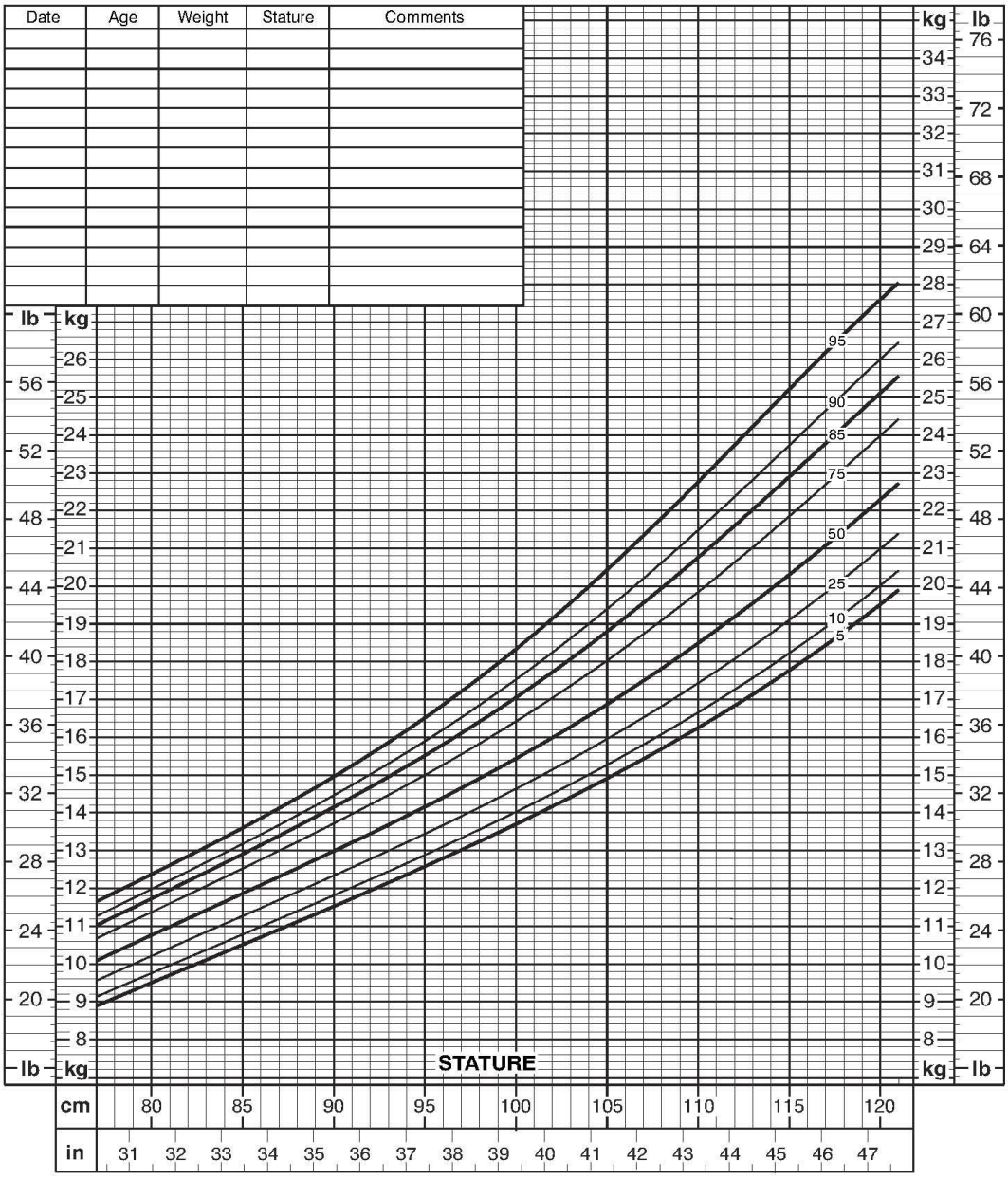


Appendix A. Weight-for-stature percentiles (cont.)

NAME _____

RECORD # _____

Weight-for-stature percentiles: Girls



Published May 30, 2000 (modified 10/16/00).

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

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Appendix B. Definitions – Physical Activity and Fruit & Vegetable Consumption

Physical Activity

Regular physical activity is important for good health when trying to lose weight or to maintain a healthy weight as it increases the number of calories one uses for energy. The burning of calories through physical activity, combined with reducing the number of calories one consumes, creates a "calorie deficit" that results in weight loss. In addition, physical activity reduces important risk factors for cardiovascular disease and diabetes beyond that produced by weight reduction alone. Physiological benefits of physical activity include (1):

- Weight maintenance
- Reduction of high blood pressure
- Reduction of risk for type 2 diabetes, heart attack, stroke, and several forms of cancer
- Reduction of arthritis pain and associated disability
- Reduction of risk for osteoporosis and falls
- Reduction of symptoms of depression and anxiety

According to the *2008 Physical Activity Guidelines for Americans*, two categories typically define physical activity, moderate and vigorous. Combinations of these activities, along with muscle-strengthening exercise, make up current physical activity recommendations for people of all ages (2).

Moderate: While performing the physical activity, breathing and heart rate are noticeably faster but a person can still carry on a conversation. Examples include:

- Walking briskly (a 15-minute mile)
- Light yard work (raking/bagging leaves or using a lawn mower)
- Light snow shoveling
- Actively playing with children
- Biking at a casual pace

Vigorous: While performing the physical activity, a substantial increase in heart rate occurs, and a person is breathing too hard and fast to have a conversation. Examples include:

- Jogging or running
- Swimming laps
- Riding a bike fast or on hills
- Playing singles tennis
- Playing basketball

For adults ages 18 and older. To receive maximum health benefits, adults should do at least one of the following:

- Two hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity (e.g., brisk walking) every week and muscle-strengthening activities on three or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).
- One hour and 15 minutes (75 minutes) of vigorous-intensity aerobic activity (e.g., jogging or running) every week and muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).
- An equivalent mix of moderate- and vigorous-intensity aerobic activity and muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).

For children and adolescents. To receive maximum health benefits, children and adolescents should have at least 60 minutes (one hour) or more of physical activity each day. Aerobic activity should make up most of a child's 60 or more minutes of physical activity each day. This can include either moderate-intensity aerobic activity, e.g., brisk walking, or vigorous-intensity activity, e.g., running. Include vigorous-intensity aerobic activity on at least three days per week. Include muscle-strengthening activities, e.g., gymnastics or push-ups, at least three days per week as part of a child's 60 or more minutes. Include bone-strengthening activities, e.g., jumping rope or running, at least three days per week as part of a child's 60 or more minutes.

Fruit and Vegetable Consumption

Three reasons support the recommendation for Americans to eat more vegetables and fruits. Fruits and vegetables are important in that (3):

- They contribute to a number of nutrients that are under-consumed in the U.S. including folate, magnesium, potassium, dietary fiber, and vitamins A, C, and K.
- They are associated with reduced risk of many chronic diseases. Specifically, moderate evidence indicates that intake of at least 2½ cups of vegetables and fruits per day is associated with a reduced risk of cardiovascular disease, including heart attack and stroke. Some vegetables and fruits may also be protective against certain types of cancer.
- They are relatively low in calories when prepared without added fats or sugars. Eating them instead of higher calorie foods can help adults and children achieve and maintain a healthy weight.

All ages. **The** ***Dietary Guidelines for Americans***, released in January 2011, keep fruit and vegetable recommendations for all Americans at 1-2½ cups of fruit per day and 1-4 cups of vegetables per day. The Guidelines contain tables that provide daily intake totals for recommended fruit and vegetable consumption based on age, physical activity levels, and caloric needs. Simplified messaging for consumers is to increase fruit and vegetable consumption and to fill plates half full with fruits and vegetables. In addition, the guidelines suggest that the majority of the fruits come from whole fruits, including fresh, canned, frozen, and dried forms, rather than from juice. Drinking 100% juice is preferred. To limit the intake of added sugars, fruit canned in 100% fruit juice is encouraged over fruit canned in syrup. (2)

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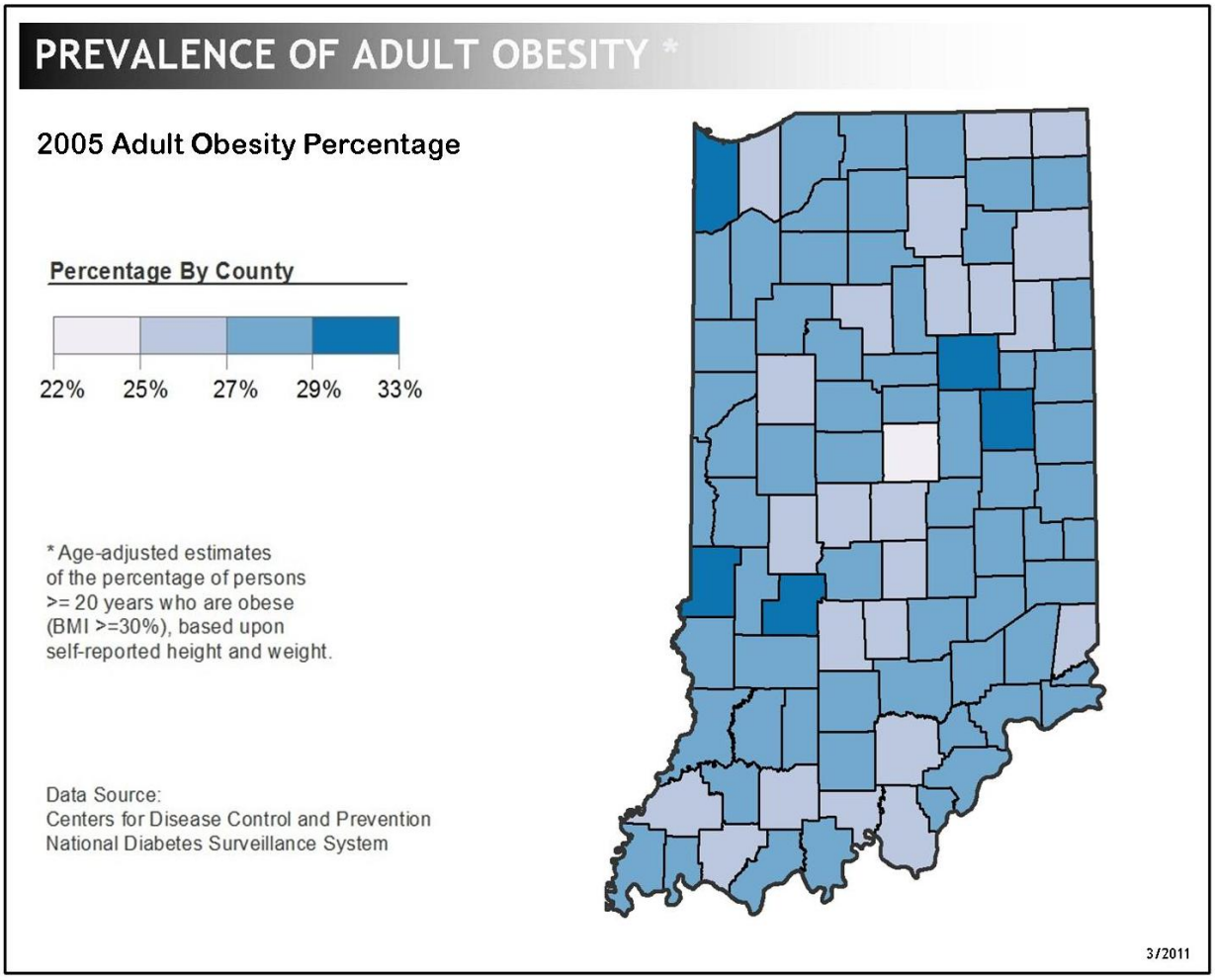
Appendix C. County-level estimates of adult obesity in Indiana, 2005



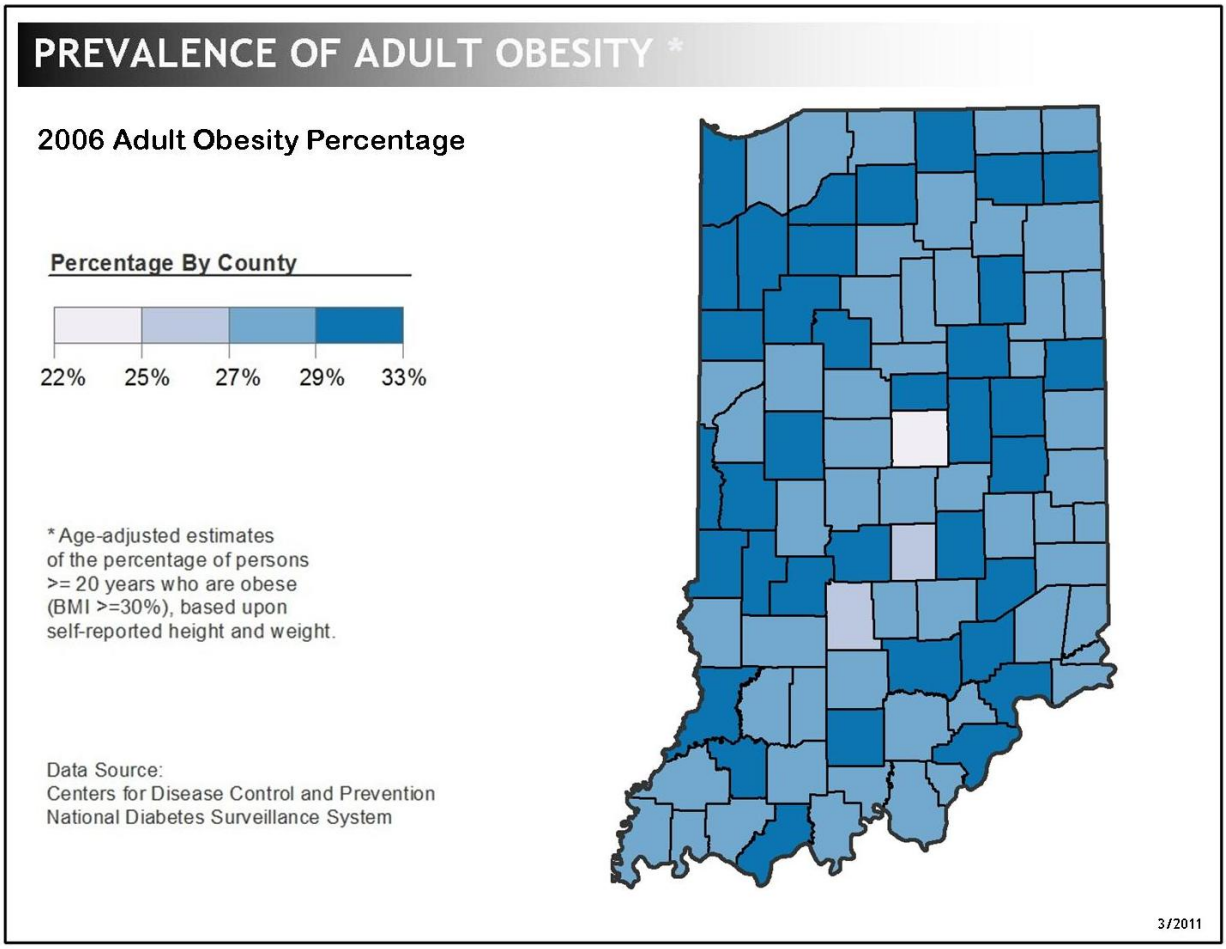
Appendix C. County-level estimates of adult obesity in Indiana, 2005 (cont.)

County	Age-adjusted Percent
Adams	27
Allen	25
Bartholomew	27
Benton	28
Blackford	27
Boone	27
Brown	26
Carroll	28
Cass	26
Clark	28
Clay	28
Clinton	27
Crawford	26
Daviess	28
Dearborn	26
Decatur	28
DeKalb	28
Delaware	29
Dubois	26
Elkhart	27
Fayette	27
Floyd	27
Fountain	27
Franklin	27
Fulton	27
Gibson	26
Grant	31
Greene	27
Hamilton	22
Hancock	27
Harrison	26

County	Age-adjusted Percent
Hendricks	26
Henry	28
Howard	28
Huntington	26
Jackson	28
Jasper	28
Jay	27
Jefferson	27
Jennings	27
Johnson	25
Knox	28
Kosciusko	26
LaGrange	26
Lake	31
LaPorte	27
Lawrence	28
Madison	27
Marion	26
Marshall	27
Martin	27
Miami	27
Monroe	26
Montgomery	28
Morgan	27
Newton	28
Noble	28
Ohio	27
Orange	28
Owen	29
Parke	28
Perry	28

County	Age-adjusted Percent
Pike	28
Porter	25
Posey	27
Pulaski	27
Putnam	26
Randolph	27
Ripley	27
Rush	27
Scott	28
Shelby	28
Spencer	27
St. Joseph	27
Starke	28
Steuben	26
Sullivan	27
Switzerland	27
Tippecanoe	26
Tipton	28
Union	28
Vanderburgh	27
Vermillion	27
Vigo	29
Wabash	26
Warren	27
Warrick	26
Washington	26
Wayne	28
Wells	26
White	27
Whitley	27

Appendix D. County-level estimates of adult obesity in Indiana, 2006



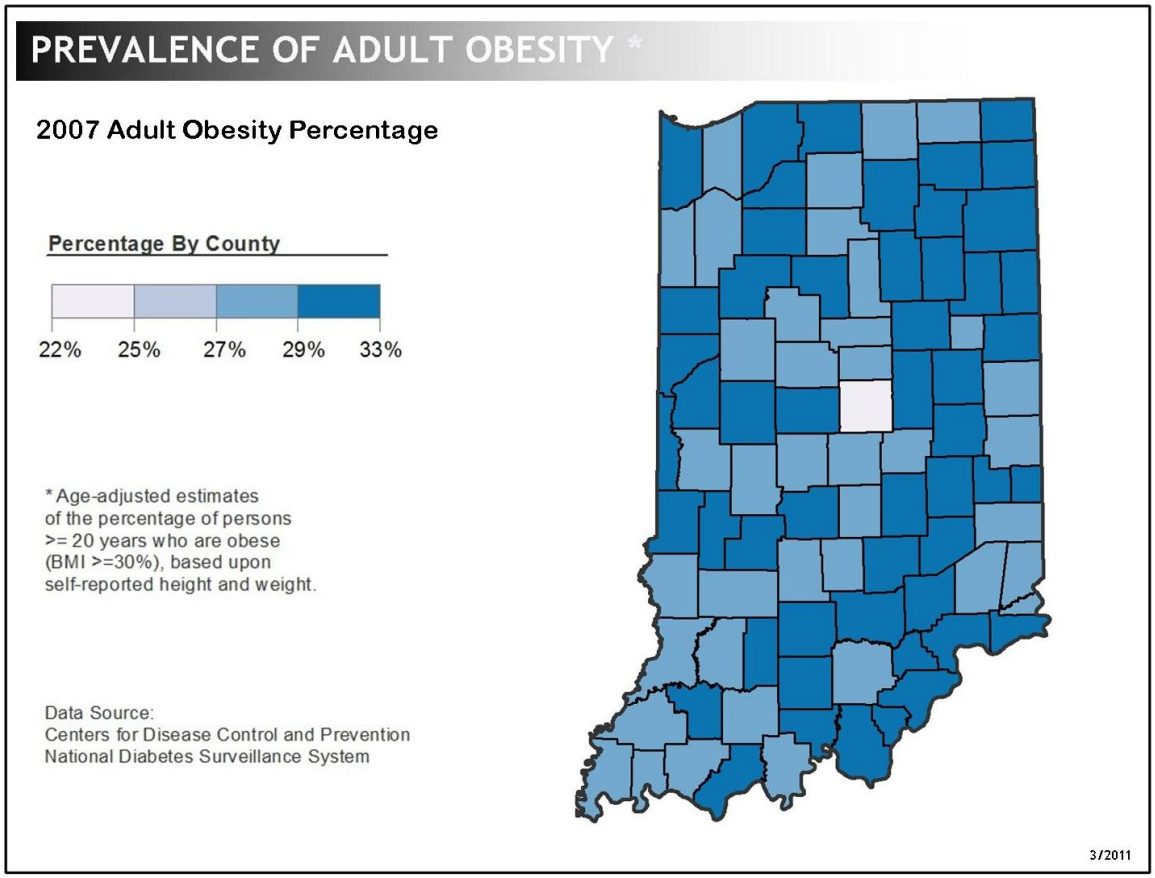
Appendix D. County-level estimates of adult obesity in Indiana, 2006 (cont.)

County	Age-adjusted Percent
Adams	28
Allen	27
Bartholomew	28
Benton	29
Blackford	28
Boone	28
Brown	27
Carroll	29
Cass	28
Clark	29
Clay	29
Clinton	27
Crawford	28
Daviess	28
Dearborn	27
Decatur	30
DeKalb	30
Delaware	32
Dubois	27
Elkhart	29
Fayette	28
Floyd	28
Fountain	28
Franklin	28
Fulton	27
Gibson	27
Grant	30
Greene	28
Hamilton	24
Hancock	27
Harrison	27

County	Age-adjusted Percent
Hendricks	27
Henry	29
Howard	28
Huntington	29
Jackson	30
Jasper	29
Jay	29
Jefferson	31
Jennings	29
Johnson	26
Knox	29
Kosciusko	27
LaGrange	27
Lake	31
LaPorte	28
Lawrence	28
Madison	29
Marion	28
Marshall	29
Martin	28
Miami	27
Monroe	26
Montgomery	29
Morgan	29
Newton	29
Noble	30
Ohio	28
Orange	29
Owen	29
Parke	29
Perry	28

County	Age-adjusted Percent
Pike	29
Porter	27
Posey	27
Pulaski	29
Putnam	28
Randolph	28
Ripley	28
Rush	28
Scott	28
Shelby	29
Spencer	29
St. Joseph	28
Starke	29
Steuben	28
Sullivan	28
Switzerland	28
Tippecanoe	28
Tipton	29
Union	28
Vanderburgh	28
Vermillion	29
Vigo	29
Wabash	28
Warren	28
Warrick	27
Washington	28
Wayne	27
Wells	27
White	29
Whitley	28

Appendix E. County-level estimates of adult obesity in Indiana, 2007



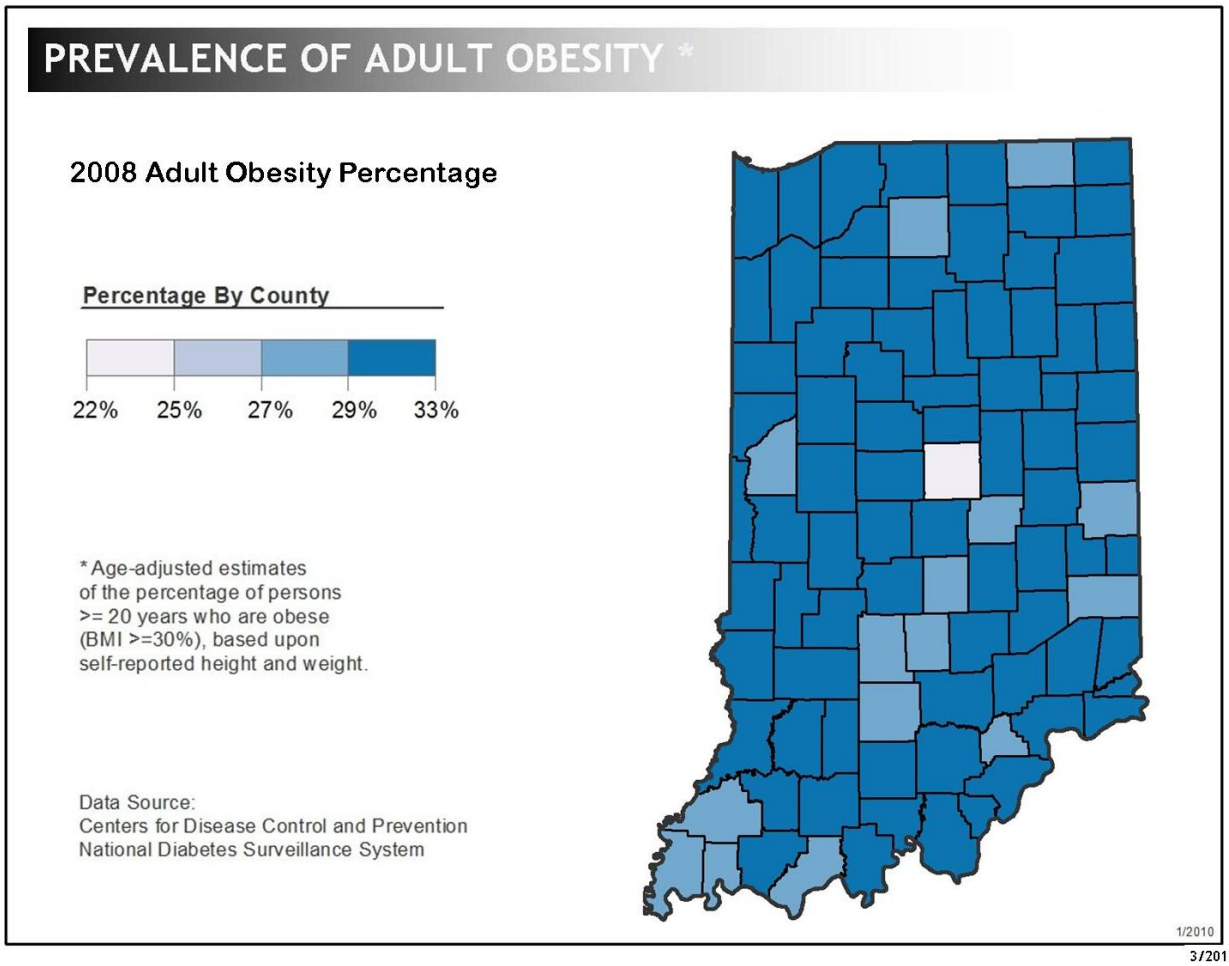
Appendix E. County-level estimates of adult obesity in Indiana, 2007 (cont.)

County	Age-adjusted Percent
Adams	28
Allen	27
Bartholomew	28
Benton	29
Blackford	28
Boone	28
Brown	27
Carroll	29
Cass	28
Clark	29
Clay	29
Clinton	27
Crawford	28
Daviess	28
Dearborn	27
Decatur	30
DeKalb	30
Delaware	32
Dubois	27
Elkhart	29
Fayette	28
Floyd	28
Fountain	28
Franklin	28
Fulton	27
Gibson	27
Grant	30
Greene	28
Hamilton	24
Hancock	27
Harrison	27

County	Age-adjusted Percent
Hendricks	27
Henry	29
Howard	28
Huntington	29
Jackson	30
Jasper	29
Jay	29
Jefferson	31
Jennings	29
Johnson	26
Knox	29
Kosciusko	27
LaGrange	27
Lake	31
LaPorte	28
Lawrence	28
Madison	29
Marion	28
Marshall	29
Martin	28
Miami	27
Monroe	26
Montgomery	29
Morgan	29
Newton	29
Noble	30
Ohio	28
Orange	29
Owen	29
Parke	29
Perry	28

County	Age-adjusted Percent
Pike	29
Porter	27
Posey	27
Pulaski	29
Putnam	28
Randolph	28
Ripley	28
Rush	28
Scott	28
Shelby	29
Spencer	29
St. Joseph	28
Starke	29
Steuben	28
Sullivan	28
Switzerland	28
Tippecanoe	28
Tipton	29
Union	28
Vanderburgh	28
Vermillion	29
Vigo	29
Wabash	28
Warren	28
Warrick	27
Washington	28
Wayne	27
Wells	27
White	29
Whitley	28

Appendix F. County-level estimates of adult obesity in Indiana, 2008



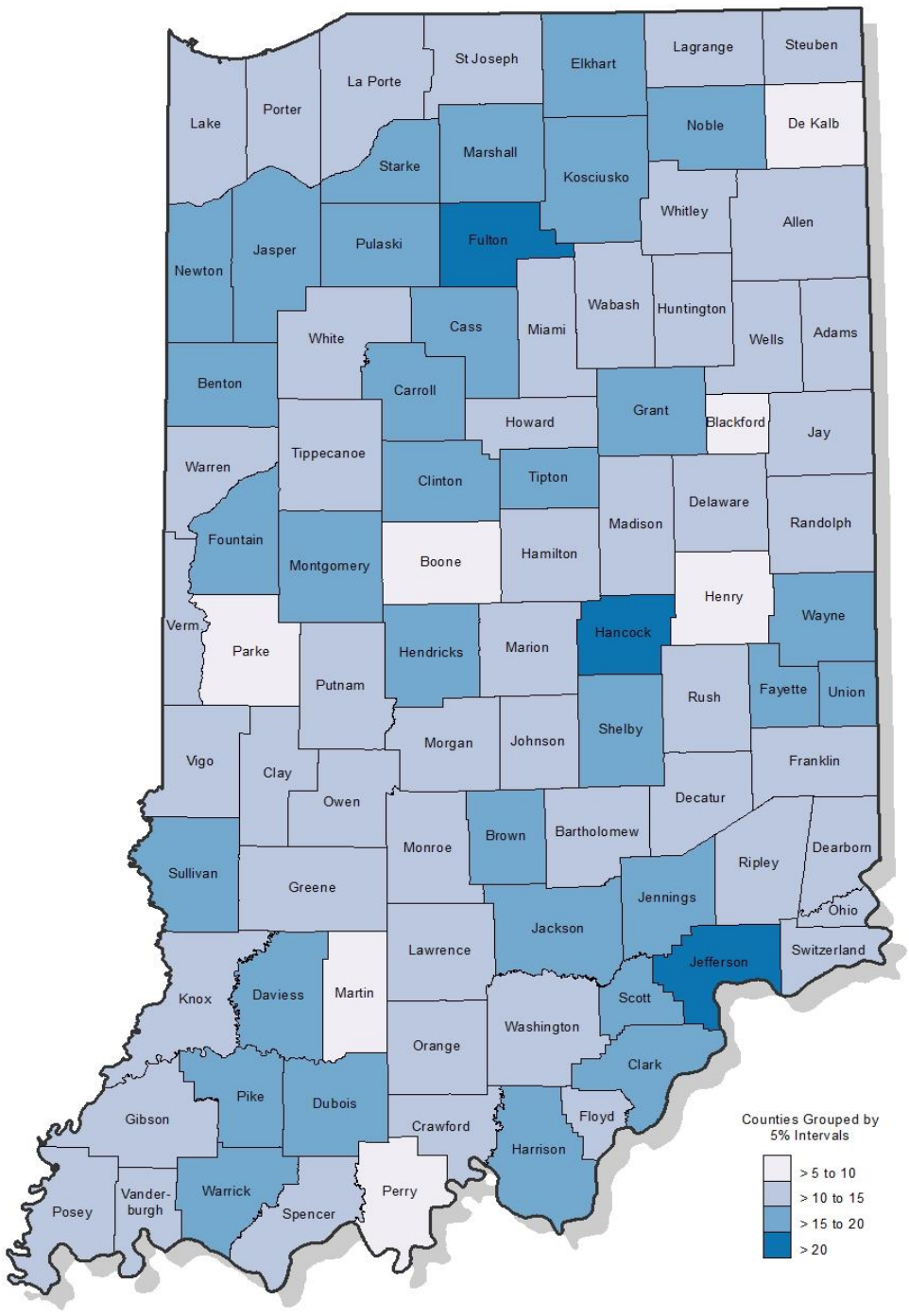
Appendix F. County-level estimates of adult obesity in Indiana, 2008 (cont.)

County	Age-adjusted Percent
Adams	29
Allen	30
Bartholomew	29
Benton	29
Blackford	29
Boone	30
Brown	28
Carroll	30
Cass	29
Clark	30
Clay	31
Clinton	29
Crawford	30
Daviess	29
Dearborn	29
Decatur	30
DeKalb	30
Delaware	31
Dubois	29
Elkhart	29
Fayette	30
Floyd	29
Fountain	28
Franklin	28
Fulton	29
Gibson	28
Grant	29
Greene	29
Hamilton	24
Hancock	28
Harrison	29

County	Age-adjusted Percent
Hendricks	29
Henry	30
Howard	30
Huntington	31
Jackson	29
Jasper	29
Jay	31
Jefferson	31
Jennings	30
Johnson	28
Knox	29
Kosciusko	29
LaGrange	28
Lake	33
LaPorte	29
Lawrence	28
Madison	32
Marion	30
Marshall	28
Martin	30
Miami	29
Monroe	27
Montgomery	30
Morgan	29
Newton	29
Noble	29
Ohio	29
Orange	30
Owen	29
Parke	29
Perry	30

County	Age-adjusted Percent
Pike	30
Porter	30
Posey	28
Pulaski	30
Putnam	29
Randolph	31
Ripley	29
Rush	30
Scott	28
Shelby	31
Spencer	28
St. Joseph	29
Starke	30
Steuben	31
Sullivan	29
Switzerland	29
Tippecanoe	29
Tipton	29
Union	29
Vanderburgh	28
Vermillion	30
Vigo	32
Wabash	31
Warren	30
Warrick	29
Washington	29
Wayne	28
Wells	29
White	31
Whitley	29

Appendix G. Prevalence of obesity among children ages 2 to <5 years, Indiana, 2005-2007



Source 2005-2007 Pediatric Nutrition Surveillance System (PedNSS)
Map authored by: ISDH ERC GIS

Appendix H. Indiana Behavior Risk Factor Surveillance Survey – Weight Status of Adults* by Selected Demographic & Behavioral Variables, 2009

Demographic Characteristics *(referent category)*	Not Overweight or Obese (percent)	Overweight or Obese (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Marital Status						
Single	42.3	57.7				
Married or Separated	30.0	70.0	**1.72**	**<.0001**	**1.482**	**1.99**
Employment Status						
Employed	33.2	66.8				
Unemployed	37.0	63.0	**0.84**	**0.0181**	**0.732**	**0.971**
Sex						
Female	39.1	60.9				
Male	30.6	69.4	**1.46**	**<.0001**	**1.26**	**1.682**
Race and Ethnicity						
White, non-Hispanic	35.2	64.8				
Black, non-Hispanic	28.8	71.2	1.34	0.0795	0.966	1.864
Other races, Multi-racial (non-Hispanic)	37.3	62.7	0.91	0.7197	0.557	1.497
Hispanic	38.8	61.2	0.86	0.4974	0.545	1.343
Age						
18-34 years	45.3	54.7				
35-44 years	34.4	65.6	**1.59**	**<.0001**	**1.269**	**1.98**
45-54 years	27.7	72.3	**2.16**	**<.0001**	**1.761**	**2.66**
55-64 years	23.5	76.5	**2.70**	**<.0001**	**2.188**	**3.325**
65-74 years	25.1	74.9	**2.48**	**<.0001**	**2.475**	**1.991**
75 or more years	44.0	56.0	1.06	0.6253	1.055	0.851
Education						
Graduated from College or Technical School	33.1	66.9				
Attended College or Technical School	35.2	64.8	0.91	0.3141	0.757	1.094
Graduated High School	34.8	65.2	0.93	0.3590	0.783	1.092
Did not Graduate High School	38.8	61.2	0.78	0.0724	0.596	1.023
Income						
$50,000 or more	32.9	67.1				
$35,000 to less than $50,000	29.0	71.0	1.20	0.0912	0.971	1.478
$25,000 to less than $35,000	32.5	67.5	1.02	0.9010	0.793	1.301
$15,000 to less than $25,000	33.9	66.1	0.95	0.6521	0.776	1.172
Less than $15,000	41.9	58.1	**0.68**	**0.0051**	**0.519**	**0.891**
Health Insurance						
Yes	33.7	66.3				
No	39.5	60.5	**0.78**	**0.0287**	**0.623**	**0.974**
Physical Activity (150 minutes)						
Yes	36.3	63.7				
No	30.4	69.6	**1.31**	**0.0004**	**1.127**	**1.513**
Physical Activity (300 minutes)						
Yes	38.0	62.0				
No	31.1	68.9	**1.36**	**<.0001**	**1.169**	**1.571**
Fruit and Vegetables 5 or more times per day						
Yes	38.1	61.9				
No	33.2	66.8	**1.24**	**0.0185**	**1.037**	**1.479**

*Overweight is a BMI between 25.0-29.9 and obesity is a of BMI ≥30.0.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix I. Indiana Behavior Risk Factor Surveillance Survey – Physical Activity* by Demographic Characteristics of Adult Residents, 2009

Demographic Characteristics *(referent category)*	150+ minutes of Physical Activity (percent)	0-149 Minutes of Physical Activity (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Marital Status						
Single	63.0	37.0				
Married or Separated	64.2	35.8	0.9	0.4692	0.825	1.093
Employment Status						
Employed	67.6	32.4				
Unemployed	58.4	41.6	**1.5**	**<.0001**	**1.303**	**1.696**
Gender						
Female	57.2	42.8				
Male	70.5	29.5	**0.6**	**<.0001**	**0.49**	**0.639**
Race and Ethnicity						
White, non-Hispanic	64.5	35.5				
Black, non-Hispanic	55.6	44.4	**1.5**	**0.0064**	**1.11**	**1.894**
Other races, Multi-racial (non-Hispanic)	60.9	39.1	1.2	0.4834	0.762	1.776
Hispanic	64.5	35.5	1.0	0.9866	0.67	1.482
Age						
18-34 years	73.1	26.9				
35-44 years	64.1	35.9	**1.5**	**0.0005**	**1.199**	**1.923**
45-54 years	63.3	36.7	**1.6**	**<.0001**	**1.261**	**1.956**
55-64 years	60.6	39.4	**1.8**	**<.0001**	**1.421**	**2.184**
65-74 years	56.1	43.9	**2.1**	**<.0001**	**1.694**	**2.647**
75 or more years	42.4	57.6	**3.7**	**<.0001**	**1.694**	**2.647**
Education						
Graduated from College or Technical School	67.4	32.6				
Attended College or Technical School	66.2	33.8	1.1	0.5536	0.888	1.248
Graduated High School	61.1	38.9	**1.3**	**0.0006**	**1.124**	**1.541**
Did not Graduate High School	55.6	44.4	**1.7**	**0.0002**	**1.268**	**2.148**
Income						
$50,000 or more	71.1	28.9				
$35,000 to less than $50,000	64.8	35.2	**1.3**	**0.0037**	**1.097**	**1.617**
$25,000 to less than $35,000	58.7	41.3	**1.7**	**<.0001**	**1.391**	**2.147**
$15,000 to less than $25,000	55.2	44.8	**2.0**	**<.0001**	**1.636**	**2.439**
Less than $15,000[§]	53.4	46.6	**2.1**	**<.0001**	**1.671**	**2.742**
Health Insurance						
Yes	66.4	33.6				
No	66.4	33.6	1.0	1	0.803	1.246

*Moderate-intensity exercise for at least 150 minutes/week or 75 minutes/week of vigorous-intensity exercise or an equivalent combination.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix J. Indiana Behavior Risk Factor Surveillance Survey – Fruit & Vegetable Consumption by Demographic Characteristics of Adult Residents, 2009

Demographic Characteristics *(referent category)*	Consume Fruit and Vegetables >=5 times per day (percent)	Consume Fruit and Vegetables < 5 times per day (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Marital Status						
Single	19.6	80.4				
Married or Separated	21.3	78.7	0.9	0.252	0.755	1.076
Employment Status						
Employed	19.5	80.5				
Unemployed	22.2	77.8	**0.8**	**0.0423**	**0.722**	**0.994**
Gender						
Female	23.7	76.3				
Male	17.3	82.7	**1.5**	**<.0001**	**1.255**	**1.756**
Race and Ethnicity						
White, non-Hispanic	20.3	79.7				
Black, non-Hispanic	21.6	78.4	0.9	0.6039	0.683	1.248
Other races, Multi-racial (non-Hispanic)	19.3	80.7	1.1	0.814	0.632	1.791
Hispanic	24.6	75.4	0.8	0.3328	0.474	1.288
Age						
18-34 years	20.7	79.3				
35-44 years	16.9	83.1	1.3	0.0745	0.555	0.931
45-54 years	20.5	79.5	1.0	0.8959	0.749	1.253
55-64 years	21.5	78.5	1.0	0.6981	0.746	1.217
65-74 years	21.3	78.7	1.0	0.8102	0.79	1.309
75 or more years	26.7	73.3	**0.7**	**0.0124**	**0.976**	**1.689**
Education						
Graduated from College or Technical School	26.0	74.0				
Attended College or Technical School	20.4	79.6	**1.4**	**0.0019**	**1.124**	**1.675**
Graduated High School	17.1	82.9	**1.7**	**<.0001**	**1.4**	**2.065**
Did not Graduate High School	18.7	81.3	**1.5**	**0.0124**	**1.096**	**2.122**
Income						
$50,000 or more	22.2	77.8				
$35,000 to less than $50,000	19.0	81.0	1.2	0.1134	0.955	1.541
$25,000 to less than $35,000	21.6	78.4	1.0	0.806	0.778	1.381
$15,000 to less than $25,000	18.0	82.0	**1.3**	**0.045**	**1.006**	**1.67**
Less than $15,000	17.9	82.1	1.3	0.0969	0.953	1.789
Health Insurance						
Yes	20.9	79.1				
No	16.7	83.3	**1.3**	**0.0546**	**0.995**	**1.748**

Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix K. Indiana Youth Risk Behavior Survey – Weight Status* by Behaviors & Characteristics of High School Students, 2009

Demographic Characteristics *(referent category)*	Not Overweight or Obese (percent)	Overweight or Obese (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Gender						
Female	72.4	27.6				
Male	70.3	29.7	1.104	0.4633	0.847	1.439
Race						
White, non-Hispanic	73.7	26.3				
Black, non-Hispanic	62.4	37.6	**1.690**	**0.0045**	**1.176**	**2.429**
Other races, Multi-racial (non-Hispanic)	68.2	31.8	1.307	0.2913	0.795	2.147
Hispanic	62.6	37.4	**1.676**	**0.0390**	**1.026**	**2.738**
Grade						
9th	68.3	31.7				
10th	69.4	30.6	0.947	0.7284	0.697	1.287
11th	77.1	22.9	**0.639**	**0.0430**	**0.414**	**0.986**
12th	70.7	29.3	0.890	0.3959	0.681	1.164
Physical Activity >=60 Minutes Per Day						
Yes	77.3	22.7				
No	67.5	32.5	**1.637**	**<.0001**	**1.349**	**1.987**
Fruit and Vegetables 5 or more times per day						
Yes	71.6	28.4				
No	71.3	28.7	1.015	0.9114	0.778	1.324
Attended PE class daily						
Yes	71.9	28.1				
No	71.1	28.9	1.039	0.7565	0.817	1.320
PE class 1 or more days per week						
Yes	72.7	27.3				
No	70.5	29.5	1.111	0.4059	0.867	1.424
Played on 1 or more sports teams						
Yes	75.5	24.5				
No	66.2	33.8	**1.572**	**0.0004**	**1.222**	**2.023**
Played video games 3+ hours per day						
Yes	70.0	30.0				
No	71.8	28.2	0.917	0.6197	0.650	1.293
Watched 3+ hours of TV on average day						
Yes	64.4	35.6				
No	74.1	25.9	**0.632**	**0.0002**	**0.494**	**0.808**
Drank soda 1+ times per day						
Yes	70.2	29.8				
No	71.8	28.2	0.925	0.4476	0.757	1.131

*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix L. Indiana Youth Risk Behavior Survey – Physical Activity Status* by Behaviors & Characteristics of High School Students, 2009

Demographic Characteristics *(referent category)*	>=60 Minutes Physical Activity Per Day (percent)	<60 Minutes Physical Activity Per Day (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Gender						
Female	28.5	71.5				
Male	52.4	47.6	**0.363**	**<.0001**	**0.289**	**0.455**
Race						
White, non-Hispanic	42.0	58.0				
Black, non-Hispanic	29.8	70.2	**1.706**	**0.0157**	**1.106**	**2.632**
Other races, Multi-racial (non-Hispanic)	43.0	57.0	0.960	0.8436	0.637	1.445
Hispanic	43.1	56.9	0.958	0.8527	0.609	1.507
Grade						
9th	49.1	50.9				
10th	40.0	60.0	**1.447**	**0.0180**	**1.066**	**1.966**
11th	36.1	63.9	**1.714**	**0.0166**	**1.103**	**2.665**
12th	35.7	64.3	**1.744**	**0.0017**	**1.232**	**2.469**
Attended PE class daily						
Yes	65.8	34.2				
No	33.2	66.8	**3.857**	**<.0001**	**2.748**	**5.413**
PE class 1 or more days per week						
Yes	58.5	41.5				
No	31.3	68.7	**3.098**	**<.0001**	**2.264**	**4.239**
Played on 1 or more sports teams						
Yes	51.5	48.5				
No	27.4	72.6	**2.825**	**<.0001**	**2.251**	**3.544**
Played video games 3+ hours per day						
Yes	31.6	68.4				
No	43.4	56.6	**0.601**	**<.0001**	**0.474**	**0.761**
Watched 3+ hours of TV on average day						
Yes	33.1	66.9				
No	43.6	56.4	**0.638**	**<.0001**	**0.514**	**0.792**

*At least 60 minutes (one hour) or more of physical activity daily.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix M. Indiana Youth Risk Behavior Survey – Fruit & Vegetable Consumption by Behaviors & Characteristics of High School Students, 2009

Demographic Characteristics *(referent category)*	Fruits and Vegetables >=5 times per day (percent)	Fruits and Vegetables < 5 times per day (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Gender						
Female	14.8	85.2				
Male	17.5	82.5	0.818	0.2329	0.588	1.138
Race						
White, non-Hispanic	15.2	84.8				
Black, non-Hispanic	21.6	78.4	0.651	0.1504	0.362	1.169
Other races, Multi-racial (non-Hispanic)	20.8	79.2	0.682	0.2323	0.364	1.278
Hispanic	16.5	83.5	0.909	0.5724	0.652	1.267
Grade						
9th	18.3	81.7				
10th	18.8	81.2	0.968	0.8704	0.659	1.424
11th	14.8	85.2	1.291	0.1170	0.938	1.776
12th	11.6	88.4	**1.717**	**0.0123**	**1.125**	**2.620**
Physical Activity >=60 Minutes Per Day						
Yes	23.0	77.0				
No	11.1	88.9	**2.388**	**<.0001**	**1.813**	**3.147**
Attended PE class daily						
Yes	17.8	82.2				
No	15.5	84.5	1.178	0.3414	0.840	1.652
PE class 1 or more days per week						
Yes	17.5	82.5				
No	15.3	84.7	1.175	0.2121	0.912	1.514
Played on 1 or more sports teams						
Yes	18.3	81.7				
No	13.3	86.7	**1.457**	**0.0018**	**1.150**	**1.846**
Played video games 3+ hours per day						
Yes	20.2	79.8				
No	14.9	85.1	1.452	0.1227	0.904	2.331
Watched 3+ hours of TV on average day						
Yes	14.3	85.7				
No	16.8	83.2	0.829	0.1924	0.625	1.099
Drank soda 1+ times per day						
Yes	18.3	81.7				
No	15.0	85.0	1.273	0.0622	0.988	1.640

Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix N. Indiana National Survey of Children's Health – Weight Status by Behaviors & Characteristics of Youth 10-17 Years, 2007

Demographic Characteristics *(referent category)*	Not Overweight or Obese (percent)	Overweight or Obese (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Gender						
Female	69.1	30.9				
Male	71.1	28.9	0.908	0.6398	0.605	1.362
Race						
White, non-Hispanic	72.5	27.5				
Black, non-Hispanic	66.5	33.5	1.329	0.4005	0.685	2.577
Other races, Multi-racial (non-Hispanic)	54.5	45.5	**2.205**	**0.0552**	**0.983**	**4.949**
Hispanic	58.7	41.3†	1.859	0.1707	0.766	4.512
Age						
10-13 years	68.5	31.5				
14-17 years	71.8	28.2	0.855	0.4486	0.571	1.281
Physical activity						
0-3 days	66.5	33.5				
4-7 days	71.8	28.2	0.783	0.242	0.52	1.179
Watch TV/videos or played video games on weekday						
<=1 hours TV or Videos	78.4	21.6				
Watches more than 1 hour but less than 4 hours per weekday	65.0	35.0	**1.963**	**0.0027**	**1.262**	**3.052**
Watches 4 hours or more per weekday	56.3	43.7	**2.82**	**0.0018**	**1.47**	**5.41**
Family structure						
Two-parent biolological/adoptive household	72.4	27.6				
Two parent household with at least one step-parent	74.0	26.0	0.918	0.8086	0.462	1.828
One parent household with a biological,step,foster,or adoptive mother and no father	58.1	41.9	**1.889**	**0.0143**	**1.136**	**3.142**
All other family structures	75.2	24.8†	0.865	0.7406	0.366	2.043
Miss school due to illness or injury						
0 days	78.6	21.4				
1-5 days	69.2	30.8	1.637	0.0768	0.948	2.826
6-10 days	64.8	35.2	**2.002**	**0.0503**	**0.999**	**4.013**
11 + days	57.0	43.0†	**2.78**	**0.0234**	**1.148**	**6.732**
Health care coverage (any type)						
Currently insured	70.6	29.4				
Uninsured	64.0	36.0	1.356	0.4328	0.634	2.899
Consistent health care coverage (past year)						
Consistent	59.2	40.8				
Periods of no insurance or none currently	71.7	28.3	0.572	0.0745	0.31	1.057
Type of health insurance						
Private	73.4	26.6				
Public	61.8	38.2	**1.709**	**0.038**	**1.03**	**2.835**
Uninsured	64.0	36.0	1.555	0.2608	0.72	3.356
Live in working poor household						
No	69.6	30.4				
Yes	75.4	24.6	0.75	0.4347	0.364	1.545
Poverty level						
< 100% FPL	60.3	39.7				
100-199% FPL	68.4	31.6	0.702	0.3299	0.344	1.43
200-399% FPL	69.7	30.3	0.661	0.2034	0.35	1.251
400% or more FPL	77.8	22.2	**0.434**	**0.0112**	**0.228**	**0.827**

*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix O. Indiana National Survey of Children's Health – Physical Activity* by Behaviors & Characteristics of Youth 10-17 Years, 2007

Demographic Characteristics *(referent category)*	Physical Activity 4-7 days (percent)	Physical Activity 0-3 days (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Gender						
Female	57.7	42.3				
Male	68.5	31.5	**0.626**	**0.0175**	**0.426**	**0.921**
Race						
White, non-Hispanic	66.9	33.1				
Black, non-Hispanic	53.4	46.6	1.766	0.0924	0.911	3.424
Other races, Multi-racial (non-Hispanic)	56.8	43.2	1.54	0.2605	0.726	3.265
Hispanic	40.7†	59.3	**2.944**	**0.0138**	**1.246**	**6.956**
Age						
10-13 years	68.2	31.8				
14-17 years	58.7	41.3	**1.514**	**0.0351**	**1.029**	**2.227**
Watch TV/videos or played video games on weekday						
<=1 hours TV or Videos	67.9	32.1				
More than 1 hour but less than 4 hours per weekday	61.4	38.6	1.332	0.1729	0.882	2.011
4 hours or more per weekday	54.3	45.7	1.778	0.0685	0.957	3.302
Family structure						
Two-parent biological/adoptive household	62.2	37.8				
Two parent household with at least one step-parent	68.2	31.8	0.768	0.4181	0.406	1.454
One parent household with a biological, step, foster, or adoptive mother and no father	66.9	33.1	0.815	0.4039	0.504	1.318
All other family structures	56.7	43.3	1.255	0.6085	0.526	2.998
Miss school due to illness or injury						
0 days	61.9	38.1				
1-5 days	68.7	31.3	0.741	0.2223	0.458	1.199
6-10 days	48.6	51.4	1.723	0.095	0.91	3.265
11 + days	61.1	38.9†	1.038	0.9294	0.452	2.384
Health care coverage (any type)						
Currently insured	64.8	35.2				
Uninsured	51.1	48.9	1.766	0.1165	0.868	3.593
Consistent health care coverage (past year)						
Consistent	58.6	41.4				
Periods of no insurance or none currently	64.4	35.6	0.781	0.4067	0.436	1.4
Type of health insurance						
Private	66.5	33.5				
Public	59.5	40.5	1.347	0.2367	0.822	2.208
Uninsured	51.1	48.9	1.898	0.0797	0.927	3.888
Live in working poor household						
No	64.5	35.5				
Yes	54.0	46.0	1.547	0.2096	0.782	3.06
Poverty level						
< 100% FPL	54.8	45.2				
100-199% FPL	53.6	46.4	1.05	0.8887	0.53	2.081
200-399% FPL	69.8	30.2	**0.524**	**0.0392**	**0.284**	**0.969**
400% or more FPL	68.4	31.6	0.56	0.0662	0.302	1.04

*At least 60 minutes (one hour) or more of physical activity daily.
†Actual number in category is less than 20 and, therefore, results are unreliable.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

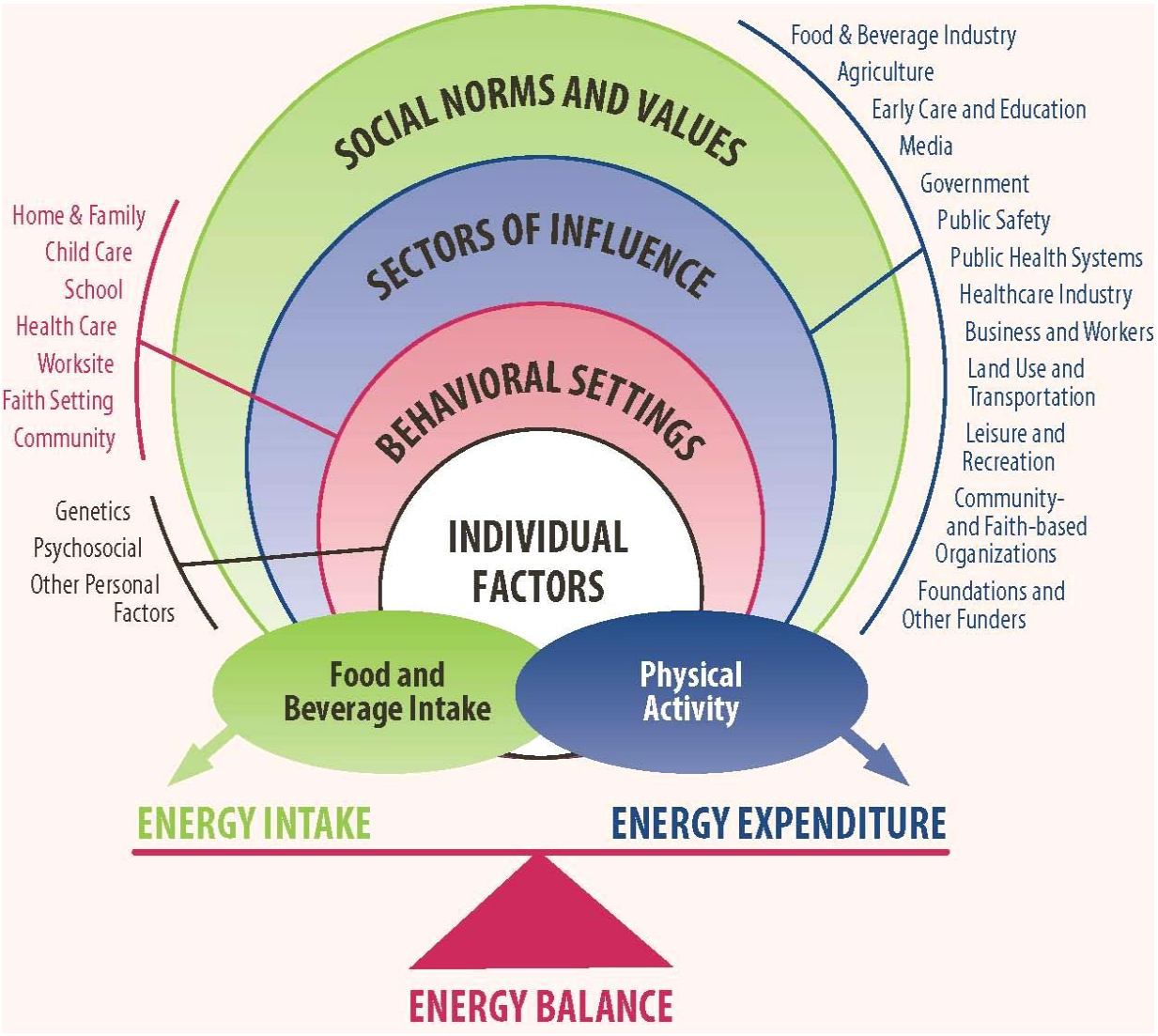
Appendix P. Indiana Pediatric Nutrition Surveillance System – Weight Status* by Behaviors & Characteristics of Children 2-4 Years, 2009

Demographic Characteristics *(referent category)*	Not Overweight or Obese (percent)	Overweight or Obese (percent)	Unadjusted Odds Ratio	p-value	95% Confidence Interval	
Gender						
Female	69.7	30.3				
Male	67.9	32.1	**0.92**	**<.0001**	**0.89**	**0.95**
Race						
White, non-Hispanic	69.8	30.2				
Black, non-Hispanic	75.4	24.6	**0.75**	**<.0001**	**0.72**	**0.79**
Other races, Multi-racial (non-Hispanic)	71.2	28.9	**0.94**	**0.05**	**0.87**	**1.00**
Hispanic	60.3	39.7	**1.52**	**<.0001**	**1.46**	**1.58**
Age						
2 years	71.0	36.4				
3 years	68.4	32.9	**1.13**	**<.0001**	**1.09**	**1.18**
4 years	66.1	30.8	**1.26**	**<.0001**	**1.21**	**1.31**
Food Stamps						
Yes	68.5	31.5				
No	68.8	31.2	0.99	0.53	0.94	1.03
Medicaid						
Yes	68.4	31.6				
No	70.0	30.0	**0.93**	**<.0001**	**0.90**	**0.96**
TANF						
Yes	68.0	32.0				
No	68.8	31.2	0.96	0.42	0.88	1.06
Percent Poverty level						
0-50	68.4	31.6				
51-100	67.5	32.5	**1.04**	**0.0348**	**1.00**	**1.08**
101-130	69.3	30.7	0.96	0.1055	0.91	1.01
131-150	72.0	28.1	**0.84**	**<.0001**	**0.78**	**0.91**
151-185	71.2	28.8	**0.88**	**0.0003**	**0.82**	**0.94**
186+	71.7	28.3	**0.86**	**0.0431**	**0.74**	**1.00**
TV Viewing						
None to <3 hours per day	69.3	30.7				
3 or more hours per day	67.1	32.9	**1.10**	**<.0001**	**1.07**	**1.14**

*Overweight is a BMI ≥85th percentile to <95th percentile and obese is a BMI ≥95th percentile.
Bolded fonts are for variables with statistically significant (p-value <.05) results.

Appendix Q.

Socio-ecological Model



Adapted from Eat Smart, Move More: North Carolina's Plan to Prevent Overweight, Obesity, and Related Chronic Disease, Caldwell, et al, 2006 and Preventing Childhood Obesity, Institute of Medicine, 2005.