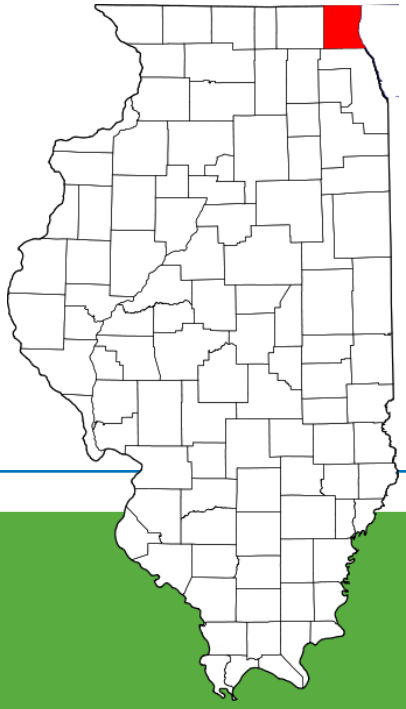
LakeCounty
Health Department and
Community Health Center
Executive Director, Tony Beltran, MBA



Obesity in Lake County
2015 Status Report

Prepared March 2015 by the Lake County Health Department Assessment Team

For more information on the Lake County Health Department, the services it offers, or additional data questions, please refer to our website at health.lakecountyil.gov, call 847.377.8000, or email at HealthAssessment@lakecountyil.gov.

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Table of Contents

Introduction

What is obesity?

People are healthiest when they are at a healthy weight – not too much or too little body fat. Obesity is a condition where a person's body fat is too high. Individuals struggling with obesity face greater health challenges (morbidity) and tend to die younger (mortality) than those with normal weights. People who are obese have a higher risk for many chronic conditions like diabetes, heart disease, stroke, high blood pressure, liver and gallbladder disease, respiratory problems, osteoarthritis, and certain types of cancer[1] that can reduce an obese person's quality of life. Obesity-related diseases are leading causes of premature death in the United States. Because obesity creates major challenges to living a long and healthy life, addressing obesity is vital to protecting and promoting public health.

The most common way of determining weight status is to calculate a person's Body Mass Index (BMI). A person's weight in pounds is divided by the square of the person's height in inches. The quotient is then multiplied by 703 to give a BMI value. The World Health Organization classifies BMI values into four broad categories: Underweight (< 18.5), Normal Weight (18.5-24.9), Overweight (25-29.9), and Obese (> 30). While very athletic people can have weights that place them in higher BMI brackets, BMI is generally useful in determining a person's weight status and risk of health problems.

$$\frac{\text{weight}_{lb}}{\text{height}_{in}^{2}} \times 703 = \text{BMI}$$

What causes obesity?

Some causes of obesity are based on the choices an individual makes. Eating unhealthy foods or too much food and not getting enough physical activity can put a person at higher risk for obesity. There are also many factors are outside of a person's control. Genetics and family history, a person's sex, his or her economic status, and race and ethnicity all influence the likelihood that someone will be obese. Where someone lives has an impact. In public health, these opportunities are related to the "built environment," or the man-made resources immediately available in a community. Location and the built environment can create barriers to accessing health care services, being able to find and afford healthy and nutritious foods, and having safe spaces nearby to exercise. Healthy diet, exercise, education, and access to healthcare can help to reduce a person's body fat or maintain a healthy weight. Infrastructure such as transportation, schools, safe parks, jobs, and stores that offer healthy food at affordable prices can promote health in a community. By looking at rates and causes of obesity, community organizations can work to address the barriers that keep people from living healthy lives.

[1] "The Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity." Office of the Surgeon General (US) (2001).

Why is obesity important to the healthcare system?

Obesity is a common and costly condition across the United States. More than one in three adults in the United States is obese. Another third of adults are overweight and at risk of becoming obese.[2] The number of obese persons in the United States has grown rapidly over the past few decades, with national rates increasing from 12% in 1990[3] to nearly 35% in 2012.[4] The Centers for Disease Control and Prevention describes this surge in the obesity rate as an epidemic.

Because obese individuals are more likely to have chronic conditions, their healthcare costs are significantly higher than those with normal weights. Additional medical costs for an obese person are$1,429 higher per year than costs for a person in the normal weight range.[5] Healthcare costs related to obesity in the United States were $147 billion in 2006.[6] Costs to individuals and the healthcare system at large are expected to rise with further increases in obesity.

What does this mean for Lake County?

Lake County residents see obesity as an important health issue in their communities. Almost half of respondents to the county-wide Community Themes and Strengths Assessment identified obesity as a moderate or major problem in their communities (48.1%). More than six in ten residents see obesity as a moderate or major problem in Lake County as a whole (62.0%).[8] As a community priority, timely, accurate data on the weight status of the communities are needed to identify priority communities and develop effective strategies to support healthy weight.

In the past, local obesity data has come from the Centers for Disease Control and Preventions' Behavioral Risk Factors Surveillance System (BRFSS), a massive phone survey designed to collect health data for the states. BRFSS's most recent estimate was calculated across years 2006-2012 and estimated an obesity rate for Lake County of 24.7% (95% CI 21.8%-27.9%).[9] Lake County's rate is lower than Illinois's (29.4%)[10] and the nation's (34.9%),[11] but still indicates a considerable burden on residents' well-being and the local healthcare system. Furthermore, different areas of the county likely experience different burdens of obesity. At the state level, obesity rates vary greatly. Rates range from a low of 21.3% for adults in Colorado up to a high of 35.1% in West Virginia and Mississippi.[13] Although the BRFSS can be used as a starting point, the all-county data does not provide sufficiently local information to identify community-level priorities and plan effective programming and interventions.

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[2] Ogden, C.L., Carroll, M.D., Kit, B.K., Flegal, K.M. "Prevalence of Childhood and Adult Obesity in the United States, 2011-2012." *JAMA*. 2014;311(8):806-814.
[3] Menifield, C.E., Doty, N., Fletcher A. "Obesity in America." *ABNF J.* 2008 Summer; 19(3):83-88.
[4] Ogden et al, 2014.
[5] Finkelstein, E.A., Trogdon, J.G., Cohen, J.W., Dietz, W. "Annual Medical Spending Attributable to Obesity: Payer- and Service-Specific Estimates." *Health Affairs,* 2009:28(5). w822-w831.
[6] Ibid.
[8] Community Themes and Strengths Survey (2011). Lake County Health Department and Community Health Center.
[9] Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention,2006-2012.
[10] Ibid.
[11] Ogden et al, 2014.
[13] CDC BRFSS 2012.

Methods

What data is the Lake County Health Department using to address the data gap?

In 2014, the Lake County Health Department used a non-traditional data source of public health data – the Illinois Secretary of State's Driver's License Records – to assess obesity in Lake County communities. A data request allowed the Health Department to receive unduplicated, de-identified[14] records from driver's licenses and state identification cards that included the individual's height, weight, sex, year of birth, year of issue, and ZIP code. Because Illinois automatically updates driver's license records at renewal and renewals occur on a four year cycle, a window of four years (2010-2014) was selected to create a "cohort" of licenses to represent the current adult population in Lake County. To ensure that the sample included only adults, the Department subtracted the year of birth from the year of issue to calculate the age at issue for each record and exclude all licenses for indivudals under the age of 18. To determine if the driver's license sample provided sufficient coverage to assess the community populations, the total record number for each ZIP code was compared to U.S. Census 2010 counts of the adults (defined as the population 18 years or older). Coverage was exceptionally high throughout the county. Some ZIP codes had a higher number of records than residents. Overrepresentation could owe in part to individuals who had moved and not updated their addresses or population growth in Lake County since 2010. Coverage was lowest in Highwood (60040, 76.0%) and a section of Waukegan (60085, 83.0%), with all other ZIP codes exceeding 90%. The Secretary of State data is one of the most complete data sets available for analysis.

To compensate for some of the biases that might affect self-reporting data, a correction factor that adjusts based on the respondent's sex and age was applied to the reported weights.[15] Individual BMI might still be slightly underestimated but at the population level, the data from the Secretary of State provide information to determine the burden of obesity and overweight status in different communities. Using methods supported by available literature, the Health Department was able to move forward with population-level comparative analysis of obesity in Lake County communities.

To calculate rates of obesity and overweight in the communities, the weight-corrected information was used to calculate a BMI value for each record. Counts of all records and counts of records with BMI values of either "overweight" or "obese" were used to calculate crude rates of obesity for individual ZIP codes. Data were weighted by community relative to its percentage of the adult population from the 2010 U.S. Census to provide an all-county estimate. Median BMI values were also determined for individual ZIP codes. Subgroup analysis was performed to determine differences in weight status for men and women in each ZIP code.

[14] Records provided to Lake County Health Department contained no information that could be directly linked to an individual, such as name or address.

[15] Dutton, Daniel J. and McLaren, Lindsay. "The usefulness of "corrected" body mass index vs. self-reported body mass index: comparing population distributions, sensitivity, specificity, and predictive utility of three correction equations using Canadian population-based data." *BMC Public Health* 2014, 14:430.

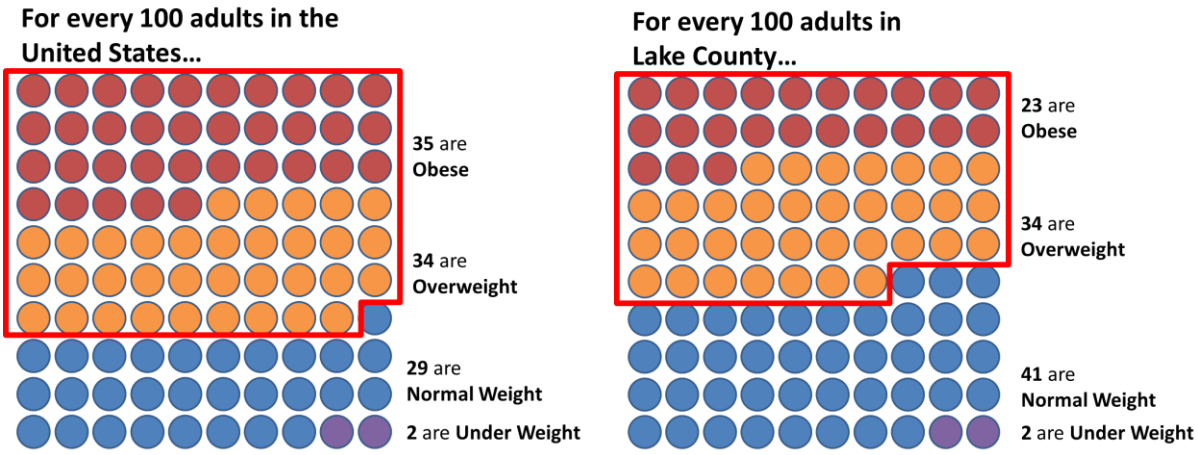
Are driver's license records accurate enough for community-wide assessments?

While new to Illinois, the method of utilizing self-reported data from driver's license records is not unprecedented. The Oregon Health Authority utilizes self-reported height and weight information from state driver's license data to calculate BMI of small geographies.[16] Despite potential biases in self-reporting, the driver's license data is consistent and allows for population-level comparisons between geographies that would be impossible using traditional surveying methods that would ultimately face similar self-reporting challenges.

Findings

Lake County adults are affected by obesity, but at lower rate than Illinois or the nation.

More than one in five adults in Lake County lives with obesity. Although the differences in methodologies make rate comparisons between this data set and BRFSS less than ideal, Lake County still has a lower rate of adult obesity by this method (weighted 22.5%) than Illinois (29.4%)[18] and the national rate (34.9%).[19] Another 34.4% of adults are overweight, bringing the total of adults who are overweight or obese and at higher risk for chronic diseases up to 57.1%. Weight status represents a health challenge for the majority of adults in Lake County.



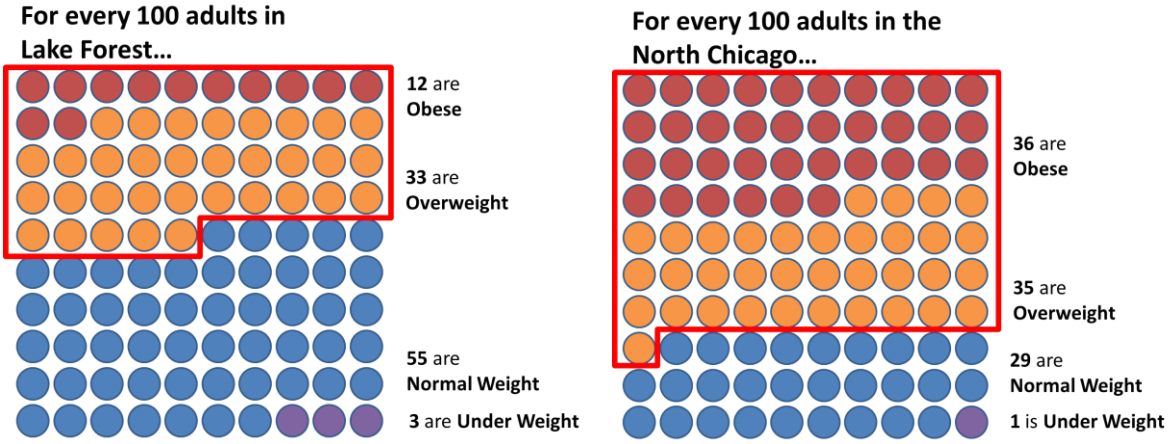
Different communities face different burdens of obesity.

While the overall obesity rate in Lake County is lower than state and national values, communities experience dramatic disparities in obesity rates. The Health Department calculated obesity rates for individual ZIP codes and identified high- and low-burdened areas. For example, only 11.7% of adults in Lake Forest are obese, about half of the county rate. The rate in North Chicago is over three times

[16] Morris, D.S., Schubert, S.S., Ngo, D.L, Rubado, D., Main, E., & Douglas, J.P. "DMV records are valuable for monitoring obesity in Oregon." Oregon Health Authority Environmental Public Health Tracking. Accessed July 2014.
[18] Trust for America's Health. *The State of Obesity: Better Policies for a Healthier America*. September 2014. Accessed March 2015 at http://healthyamericans.org/report/115/
[19] Ogden et al, 2014.

greater than in Lake Forest; in this community, 35.7% of adults are obese. Interventions can be targeted in communities that need them most.

Disparities correlate with income.



Lake Forest (60045) and North Chicago (60064) represent the economic extremes in Lake County. Lake Forest has the highest median household income ($150,406) while North Chicago has the lowest ($35,293).[20] Median household income is strongly related to rates of obesity and overweight status. A full list of communities by ZIP code, with their individual rates of obesity and combined obesity and overweight are included as an appendix.[21] As income increases, rates of adult obesity drop. With this comparative data, the Health Department and communities can determine where the need for interventions is greatest.

Sex changes the way income affects weight status disparities.

Men are more likely than women to be obese in most communities, but women's obesity rates are more sensitive to income than men's. While obesity rates are extremely high for men and women in North Chicago (33.2% for men and 38.5% for women), the income-dependent decline is much more pronounced for women. At the highest income levels in Lake Forest, the rate of obesity in women is 5.7%, but 17.9% for men. For the whole county, the women's obesity rate is 17.9%, while for men, it is 26.7%.[22] Understanding differences in obesity status due to sex can help to better target messaging within communities in order to maximize the impact of interventions.

Age also influences BMI values and weight status.

Men and women change weight status at different life stages. By taking the average BMI by age for all records, patterns in how weight profiles change with age were determined. Average BMI is lowest at age 18. Both men's and women's average BMI increase between 18 and 30 before leveling off in the overweight range. Women's BMI increases from age 55 to 70. In their early 70s, both averages of men

[20] American Community Survey, 2009-2013 (5 Year Estimates).
[21] For a complete chart of income and rates of overweight and obesity by ZIP code, please see Appendix A.
[22] For a graph displaying the two trends, please refer to Appendix B.

and women begin to decline.[23] Overall, the data indicate that BMI increases dramatically for both men and women throughout their 20s but generally plateaus for most of the rest of their adult lives. Intervention at this stage to prevent obesity might help to reduce the overall burden of obesity.

Conclusions

Driver's license records provide a robust data set for determining weight status in communities.

The Secretary of State data set provides extraordinary coverage. For population estimates, the corrected weight values were able to provide meaningful comparisons between communities in Lake County. These methods could be used by other Health Departments to better understand challenges associated with weight status and resulting chronic diseases. The data generated here would be useful to organizations looking to better understand how obesity affects their communities.

Obesity is an important issue in Lake County.

Obesity affects almost one in four adults in Lake County. The total overweight and obese rate in the county includes 56.9% of adults. Costs to both the individual and healthcare system are considerable and reduce the overall quality of life for those affected by high weight status. Interventions aimed at addressing this challenge would support health improvement across Lake County and promote general health and well-being for the majority of residents. The burden of obesity is unequal across the county. Significant disparities exist between communities. Community rates of obesity range from 11.7% to 35.7%.

Economic and demographic differences in weight status can help to better target interventions in priority communities.

The range of obesity rates varied dramatically from community to community. Median household income is highly correlated to rate of obesity ($r = -0.871$). A community's relative need for interventions can be more confidently prioritized with these small geography values. Age and sex differences in weight status can help to shape outreach and intervention messages. Community and group trends will allow the Health Department and community partners to structure more effective campaigns to reduce adult obesity in Lake County.

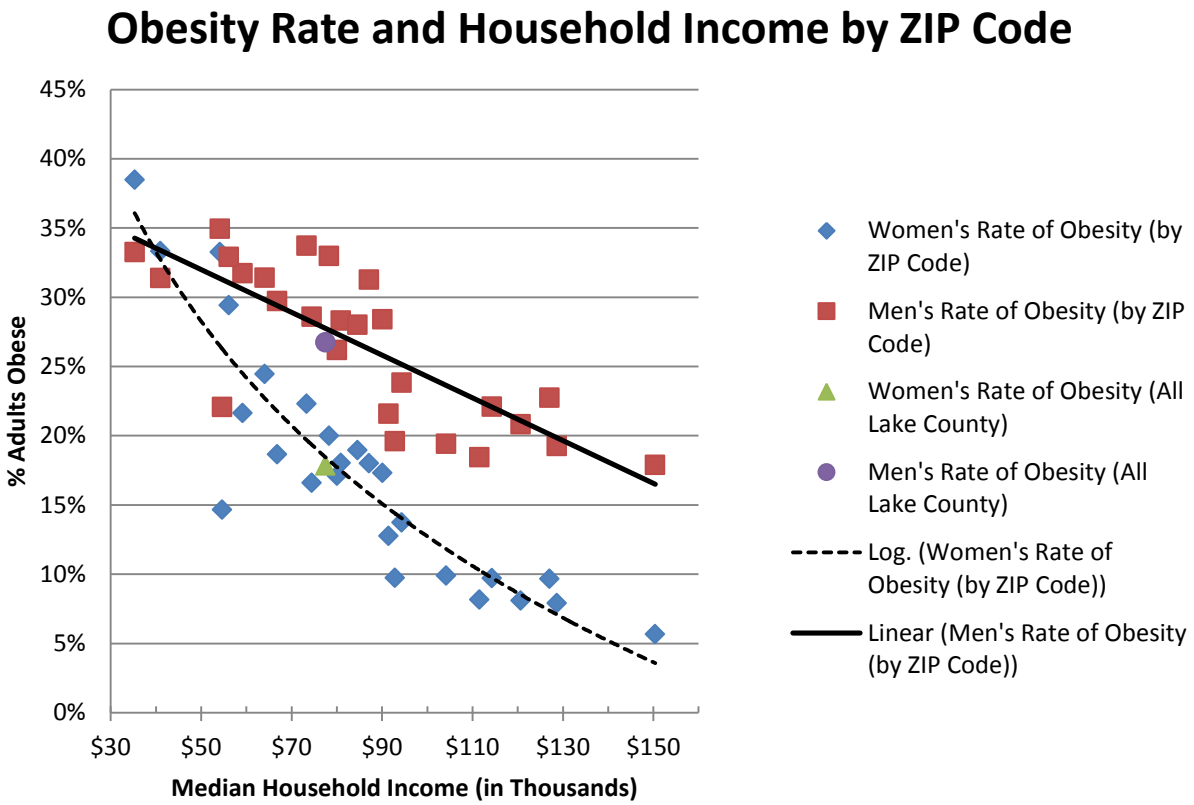
[23] For a graph displaying average BMI by age, please refer to Appendix C.

Appendix A: ZIP Code, Median Household Income,[24] and Obesity Rates[25]

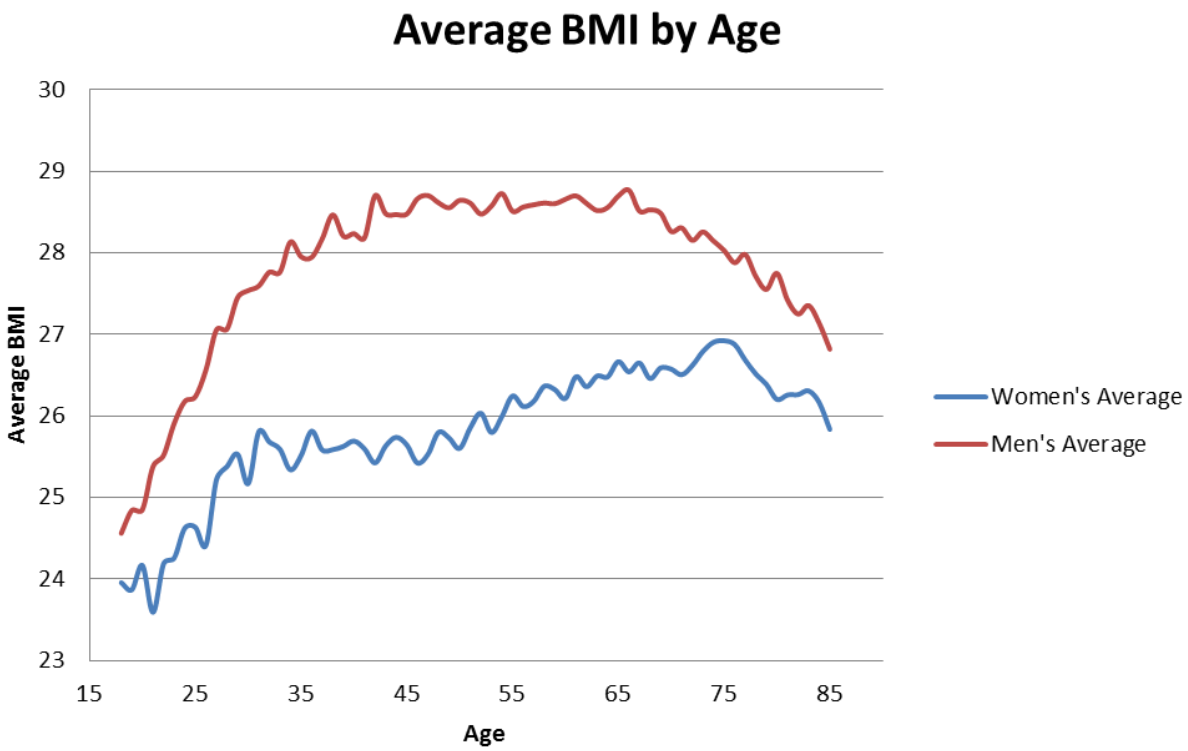
ZIP	Median Household Income	% Obese	% Overweight or Obese
60002	$78,250	26.6%	61.5%
60010	$120,632	14.5%	48.2%
60015	$128,676	13.5%	46.3%
60020	$59,175	26.7%	60.8%
60030	$80,909	23.0%	57.3%
60031	$84,548	23.4%	57.8%
60035	$111,549	13.2%	46.9%
60040	$54,612	18.6%	53.1%
60042	$66,808	24.2%	58.5%
60044	$92,861	14.6%	47.3%
60045	$150,406	11.7%	45.1%
60046	$87,107	24.8%	59.3%
60047	$126,999	16.3%	50.3%
60048	$114,284	15.9%	49.6%
60060	$80,069	21.8%	56.8%
60061	$91,443	17.1%	50.4%
60064	$35,293	35.7%	70.9%
60069	$104,196	14.6%	49.3%
60073	$64,086	28.0%	63.0%
60083	$90,093	22.8%	59.7%
60084	$74,427	22.8%	57.8%
60085	$41,006	32.3%	67.9%
60087	$56,122	31.2%	66.9%
60089	$94,351	18.8%	52.3%
60096	$73,304	28.1%	64.1%
60099	$54,152	34.1%	67.9%
Lake County	$77,469	22.5%	56.9%

[24] American Community Survey, 5-year Estimates (2009-2013).
[25] LCHD Data

Appendix B: Obesity Rates for Men and Women, Compared to Median Household Income, by ZIP Code



Appendix C: Obesity by Sex and Age



Appendix D: Map of Obesity Rates in Lake County, by ZIP Code