

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

Is There a Relationship Between Obesity and Economic Hardship?

A graduate project submitted in partial fulfillment of the requirements
For the degree of Master of Public Administration in Public Sector Management and
Leadership

By
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December 2018

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Abstract

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Research has indicated a significant correlation between economic hardship and health status. The citizens who have a lower level of income are likely to face financial complications. Most of the researchers are trying to establish a clear link between the financial difficulties and obesity in the country. The thesis will analyze the relationship between economic hardship and body weight, having obtained data from different sources including the National Longitudinal Survey of Health. The samples that will be obtained will be divided into portion; that is the women and the men. The thesis will, therefore, discuss the various financial difficulties such as credit card debts, the body mass index, and obesity. The research will utilize most of the economic tools that include the OLS techniques, the Propensity Score Matching, and the Sibling Fixed Effects to offer a clear relation between the financial difficulties and obesity.

Section 1: Introduction

Most of the economic theories have suggested that there is a great correlation between the debt levels and the health status of an individual. The data that have been obtained has indicated that about 17 percent of the children in the United States of America have obesity and therefore risk many diseases such as cardiovascular and type 2 diabetes. The economic situations in the country have been linked to an increase in the level of child obesity in Los Angeles.

The research will relate the socio-economic indicators in the country and the level of obesity among the children. The studies have confirmed that the economic and social conditions have been linked to obesity. The studies that have been done through social experiments have examined obesity changes among the individuals in the country. The cities that have higher level of poverty experience less of the child obesity and lower level of body mass indexes. The research has shown that the poverty level has made people change their diets. The children who attend schooling have a lower possibility of having a high body mass index.

Most of the researchers have ascertained that obesity has been related to economic status. The researcher has requested the policymakers to develop a solid framework that would lead to prevention of the issues of obesity in the country caused by economic and environmental factors. In this thesis, I will analyze the relationship that occurs between the economic hardships and the obesity of children in Los Angeles County. Los Angeles has in the past been characterized by continuous ethnic and racial level of diversity. The region has a significant disparity in the socio-economic issues

Background

The research will analyze the economic hardship in relation to increasing numbers of obesity. Comparison of cities and communities will demonstrate how socioeconomics, demographics, and economic hardship have an impact on obesity in Los Angeles County. The study will obtain data from about 128 cities in Los Angeles as the individual unit of analysis. Obesity is a national issue, and however, by examining data at the local level, the prevalence is quite significant. The research design will consist of a non-experimental design. The design will allow us to confirm economic hardship and its relationship to the increasing prevalence of obesity. The data analyzed will explain if economic hardship is a factor of obesity.

This research contains data on the prevalence of obesity and economic hardship. The organization that produced the data is the County of Los Angeles Public Health Department. The data is relevant to the research because it encompasses the demographics and will demonstrate the trend of increasing numbers of obesity and its correlation to economic hardship based on the hypothesis. The data on economic hardship was collected by the Census 2000. The prevalence of obesity data was collected between 2004-2005 by the Centers for Disease Control and Prevention. This was a significant time due to the high numbers of prevalence. The cities and communities observed had a population size of 5,000 or more. The economic hardship index provided data from 128 cities of Los Angeles.

The economic hardship in the county has been characterized by the housing situations that are crowded, poverty index, level of unemployment in the country, the

education level of the country and other many factors. The dependent population in the thesis are the people who are over 64 years and the ones that are under 18 years. A quote from the Department of public health has shown that, “Of the 142 cities together with the communities who are in Los Angeles County, there were 128 cities or the county communities which have the BMI data; these were ranked against one another, with 1 indicating the lowest prevalence and 128 indicating the highest prevalence of obese youth” (Los Angeles County Department of Public Health, 2007).

Obesity is a complex epidemic that has significantly increased over time. There are many ways obesity can be developed like from poor eating habits, lack of exercise, medications, psychological disorders, etc. Obesity is a serious condition as it causes detrimental effects to people of all ages. Obesity can cause cardiovascular diseases as well as diabetes. These diseases are not easily curable and require plenty of medical care. By researching how children and adults are affected by obesity in different levels of income groups, you can begin to find solutions to obesity.

Obesity is also described as a disorder of excess body fat. Additional causes of obesity can be from environmental changes, food taken, the family genes, level of income and the lack of sufficient physical activities. Effects from obesity can be related to adverse health issues, depression, death, and even eating disorders. Different levels of income groups will be examined and their relationship to increasing numbers of individuals who are dealing with obesity. Upcoming research will demonstrate the trend of increasing numbers of obesity and its correlation to economic hardship. This research will inquire into a possible association between obesity and economic hardship.

Economic hardship levels will be analyzed to determine demographics associated with obesity.

Demographics will be crucial in making this comparison. This comparison will demonstrate differences in lifestyles, accessibility to different foods, and the structure of communities. These are important variables in making observations of the possible association of obesity and economic hardship levels. This research intends to investigate a possible association between economic hardship levels and obesity.

In comparison, we will come across the issues of race-ethnicity, gender, age, socio-demographic factors and specifically income that plays a role in contributing to obesity. Your lower income groups seek out lower-cost foods and groceries. We will demonstrate how families tend to share eating habits and lifestyle habits. Numerous of these and other conducive factors affect everyone at some point during their lifespan. Families who are food insecure or low-income face these challenges. Through research throughout Los Angeles County will demonstrate how socio-economic, demographics and income have an impact on one's health contributing to obesity. This research will explore whether obesity increases as income decreases.

Problem Statement

The issue that needs to be addressed in the thesis is obesity. Obesity in Los Angeles has been related to the economic levels of the people living in the area. The thesis will need to offer a clear relationship that occurs between the economic hardship in Los Angeles cities and the obesities in the county. In this case, the researchers will give

the policymakers a transparent platform that would enable it to offer a solution to the issues of obesity in the county. The obesity in the country has, therefore, been related to the economic hardships in the thesis. Once the problem has been identified, the researchers will need to offer a solution to the problems that are in Los Angeles in relation to Child Obesity.

Research Question on the Analysis

The thesis will seek to offer answers to various research questions that arise in Los Angeles. The research questions that will be discussed will include:

- i. What is the relationship between economic hardship and child obesity in Los Angeles?
- ii. What are the other leading causes of obesity among children in Los Angeles?
- iii. Does the type of food that people take in Los Angeles affect the body mass index among the children in the county?
- iv. What are the steps that have been taken by the county to reduce the issues of obesity in Los Angeles?
- v. What is the comparison of the child obesity in Los Angeles County with other counties in the United States of America?

Objectives of the Research

The research will have a broad objective of analyzing the relationship that occurs between the economic hardship in Los Angeles and obesity. The specific objectives of the research would, therefore, be as follows:

- a) Determine the relationship that occurs between the economic hardship in Los Angeles and the child obesity within the county.
- b) To evaluate all the causes of the child obesity for the children in Los Angeles and the various communities in its environs.
- c) To determine the possible steps to curb the childhood obesity and economic hardships in the county.
- d) To compare other counties that are prone to childhood obesity with the Los Angeles County and offer a justified report.

The Significance of the Study

The significance of the research is to clearly understand the relationship that occurs between the economic hardship in the country and the level of child obesity. The general contribution of the research will be to offer a definite conclusion and recommendation on the relationship between childhood obesity and economic difficulties. The contribution would greatly help the other economics to design relevant policies on the same issues in Los Angeles.

Section 2: Literature Review

The literature review will point out various knowledge on the research topic. Various researchers will be identified and the finding documented in the research. The paper will involve pointing out various peer-reviewed journals that will assist to extend the knowledge on the research topic. In this topic, the various researcher will point out other obesity-related topics in other cities or countries globally but specifically in Los Angeles. The assumptions that will be made in the other researchers will also be pointed out clearly to make a justified conclusion in the research.

According to Adler & Stewart (2009), every individual needs to ensure that they undertake actions that promote their health status. The resources that they have should be used to develop their life standards and health conditions. In Los Angeles, the people who are of a low class would face a challenge of health maintenance. Besides, the authors have also explained the various causes of health obesity. The explanation is in the form of the medical obesity that shows on the various cause of obesity, the individual actions that can be taken to curb obesity (Adler & Stewart, 2009). The authors have made an assumption that all the citizens are informed and make responsible decisions on health status.

The poor health maintenance in the community has, therefore, become the cause of obesity in the county and needs to be addressed in every environment. From the postulation of Adler & Stewart (2009), individuals need to continually undertake exercise and take good diets in the community. Most people have become responsible for their downfalls in the community or cities in Los Angeles. Also, environments differ in the

types of access to resources. In order to combat obesity, there needs to be accountability from individuals as well as society (Adler & Stewart, 2009).

Do et al. (2008) has pointed out that unhealthy lifestyles contribute to the obesity epidemic and research says that it is especially problematic in developing nations; hence, poverty was somehow related to obesity. Poor people consume more carbonated drinks, fewer vegetables and fruits, and more fast food. Most young adults do not even realize that their lifestyle can lead them to obesity in the long-run. If young adults modify their diets, it could reduce obesity among poor adolescents. Poverty is associated with sugary drinks, fast food, and poor vegetable intake, something that directly led to obesity in Los Angeles (Do, et al., 2008). This research explained why poverty relates to obesity and how it becomes apparent that poor people choose sugary drinks, fast food and poor vegetable intake that leads them to obesity. Although research does not explain what triggers the behavior.

According to Kidd and Peters, eating habits of low-income individuals could lead to obesity. The research team surveyed 235 respondents aged 18-24 who earned less than \$25,000 per year. The research deliberately accounted for population-specific differences, such as age, weight satisfaction, income, education, and self-efficacy to show how those could impact fruit consumption (Kidd & Peters,2010). A finding surfaced that fruit consumption is inversely correlated with the risk of certain cancers, various heart disease together with stroke. Kidd & Peters (2010) also pointed out that the fruit consumption inversely related to weight gain, so more fruit consumption meant less weight.

Despite the various benefits of fruit consumption on health, young people and individuals with low income, limited education, or low self-efficacy, consume insufficient amounts of fruits. Those adults who based their decision to consume fruits on health benefits or weight loss were more likely to consume more fruits. This research argues low-income earners in the society consume less fruits leading to various disease. Low-income earners also do not take much fatty food leading to a reduction of the obesity level. Kidd and Peters suggest focusing attention to the motivation and underlying set of beliefs among low-income adults (Kidd & Peters, 2010). The right set of beliefs and decisions led to higher fruit consumption and lower obesity rates even among low-income adults (Kidd & Peters, 2010).

According to Shih, Dumke, Goran, & Simon (2012), poverty and economic hardship are related to obesity, but sociocultural differences among different races impact the eating habits and correlate differently with obesity in Los Angeles. Poverty is related to childhood obesity, and low-income neighborhoods are more likely to have obese children. It was also determined the social level community condition together with the economic conditions. All these can be illustrated from the composite Economic Hardship Index that has become positively correlated with other childhood obesity (Shih, Dumke, Goran, & Simon, 2012). The communities in highest hardship quartile had twice as many obese children as did communities in the lower hardship quartile. Furthermore, race and ethnicity impacted obesity rates, too.

The research analyzed 298,485 children in Los Angeles using a census-tract-based Economic Hardship (EH) index. The findings were predictable, i.e., high community-level EH was positively correlated with childhood obesity. The highest

quartile had the highest obesity. The Non-Hispanic students who are white, most of the Hispanics, and other non-Hispanic Asians in the high EH index was more likely to become obese; while this figure was lower for black students. Shih, Dumke, Goran, & Simon (2012) has contributed by drawing attention to how economic hardship impacted specific race, which responded with a unique dieting habit that could lead or not lead to obesity (Shih, Dumke, Goran, & Simon, 2012).

Further research indicated that eating habits of low-income adults regarding fruit and vegetable consumption can be compared to the eating habits of more "advantaged counterparts." Bihan et al. indicated that low-income adults consumed fewer servings of fruits and vegetables, which resulted in less healthy food habits. A food voucher system was proposed by Bihan, et al., to increase the consumption of fruits and vegetables among low-income adults. It examined how low-income adults differ in food consumption habits after "advise alone" and "advise + voucher" to determine the impact of food vouchers. The blood tests for blood pressure and vitamins showed that low-income adults without vouchers lead to unhealthy lifestyles. In relation to obesity and economic hardship, one should note that poverty is associated with malnutrition, while food vouchers for fruits and vegetables can improve the situation (Bihan et al., 2012).

According to Babey, Hastert, Wolstein, & Diamant (2010), the research led to exploring how and whether income correlated with obesity rates in California adolescents. The authors used a sample of 17,535 adolescents in California who responded to a survey to examine their family income and obesity. The principal argument was that low income meant that families were less likely to make or afford healthy food choices, hence were more likely to become obese due to the use of cheaper,

junk, and fast foods (Babey, Hastert, Wolstein, & Diamant, 2010). Indeed, the results showed that between 2001 and the year 2007 obesity rates rise the level of low-income youths. There was no correlation between obesity and high-income adolescents. The magnitude in income disparity with the issue of obesity prevalence tripled between the years 2001 to 2007 (Babey, Hastert, Wolstein, & Diamant, 2010). When relating this information to research, it becomes apparent that the growing disparity in obesity probability among lower-income youths places them at ~~in an~~ excessive risk of obtaining the adulthood issues of obesity as well as diabetes, hypertension, heart disease, stroke, and cancer. The sample size of 17,535 shows that much work was done to double-check all correlations and conclusions. The findings do fit and relate to our research that poverty is correlated with obesity (Babey, Hastert, Wolstein, & Diamant, 2010).

From the postulation of Wang & Beydoun, (2007), the gender, education, and occupation also played a role in the obesity epidemic, since educated and well-paid individuals are less obese. Besides, low socioeconomic status is related to larger body size in men according to McLaren (Wang & Beydoun, 2007). The author attempted to further the research conducted previously by Sobal and Stunkard regarding the relationship between socioeconomic status and obesity. McLaren (2007) conducted research based on various online databases, such as Canal, Eric, Medline, and Social Science Abstracts and pointed out the significant findings for the period 1988 till 2004 9 McLaren, 2007). The author explored more than 333 studies that represented about 1,914 primarily cross-sectional associations. In developed countries, women without education and occupation were negatively correlated with obesity. In low and medium income nations, women's body size was inversely related to wealth, i.e., poor women were larger.

Therefore, it is suggested that obesity can be overcome not only with economic improvement and stimulus but also with sociocultural changes (McLaren, 2007).

As part of socioeconomic status, research should explore the impact of gender, age, racial/ethnic groups, and geographic regions on obesity rates, or epidemics. Sources such as NHANES surveys, BRFSS surveys, Young Risk Behavior Surveillance System together with the National Longitudinal Survey of Adolescent Health, pointed out that from the 1960s till 2004 the level of the obesity among adults rose significantly from 13 percent to 32 percent and nowadays more than 66% of the adults were overweight or obese, while 16% of the children together with the adolescents were overweight and 34% more were at risk of getting overweight. Research by Wadsworth, T., & Pendergast (2014) shows that minorities and low-socioeconomic class people were more likely to become overweight and obese. By 2015 more than 75% of American adults would be overweight or obese and about 41% of all Americans would be obese (Wadsworth, T., & Pendergast, 2014). This information confirms that gender, race, and ethnicity further impact the obesity rates among the low socioeconomic status. Wang & Beydoun, (2007) further hinted that poverty alone was not responsible for obesity, but the racial/ethnic customs, traditions and culture and their impact on eating habits could influence obesity among the poor (Wang & Beydoun, 2007).

From the argument posted by Desilver, 2013, obesity and poverty are not necessarily related, but gender and race are. This argument surfaced from information gathered by government and non-government agencies related to poverty and obesity (Desilver, 2013). The critical argument is that obesity is the disease of the poor, yet DeSilver believed that it was political correctness that did not allow other researchers to

argue that race and gender were related to obesity. Among rich men, obesity was prevalent among black and Mexican-American men, which comprised the major trend (Desilver, 2013). Correlation between less affluent or poor men was less pronounced among men of different races. For women, the situation was the reverse. All wealthy women (of all races) were less likely to become obese. Poor women, on the other hand, were more likely to become obese. The major pronounced trend was for wealthy white women, as those were least likely to become obese (Desilver, 2013).

Theoretical Framework

People with low socio-economic status Los Angeles are more likely to be susceptible to obesity. They are more likely to work more, have less education, and have less time to lead a healthy lifestyle that combats obesity. Thus, they may have less self-control to avoid junk food, unhealthy but cheap fast food and all other foods advertised in mass media. A common characteristic of one in poverty is making poor choices about their health, diets, and exercise.

Obesity has been on the rise, and its prevalence can be explicitly seen in areas of economic hardship. Obesity is a condition that is associated with having excess fat and a body mass index (BMI) of 30 or more in Los Angeles. According to Kumanyika and Grier when a child is obese, they will most likely be obese adults who suffer obesity-related health issues (Kumanyika & Grier, 2006). Obesity is an epidemic that affects all ages and creates short and long-term implications. Chronic health conditions develop because of the increased obesity. *“Obesity has been linked to increased incidence of*

several chronic diseases, like diabetes and heart disease, and to lower life expectancy (Bhattacharya & Sod, 2011).”

The paper expects to find differences between groups or relationships between phenomena because socio-economic status impacts the person's lifestyle significantly. The amount of money they have to spend on their leisure and health, the level of education to learn more about what is right and what is not for one's health. The paper explores only the correlation between socioeconomic status and obesity without exploring causality and the true causes of such correlation. Although, obesity in the USA among the people with low socioeconomic status generally seems to be linked to improper diets rich in fats and carbohydrates and poor in vitamins, minerals, and fibers (Kidd & Peters, 2010).

All these assumptions certainly require testing but get based on the understanding how every person is impacted by his/her frames of reference and cultural, religious or ethnic backgrounds (Shih, Dumke, Goran, & Simon, 2012). To make a compelling public policy that would help all people, rather than only some specific group, it is necessary to see how people of different age, gender, race or cultural backgrounds approach their health, lifestyle, and obesity in Los Angeles. For the purpose of research, it is enough to know of the possible differences between races, genders, and socioeconomic statuses to research correlations between these factors and obesity rates, without having to explore the real causes of obesity rates for distinct groups.

Socioeconomic factors are key players in this rising epidemic where social standing and financial viability dictate one's lifestyle. Environments of economic hardship lack designated recreational areas where children can play, or adults can partake

in physical activities. For this reason, individuals become sedentary and develop habits such as watching television. According to the postulation of Garcia & Fenwick (2009), the cities that have less open areas, parking sides, fields, and even wilderness make the children prone to obesity (Garcia & Fenwick, 2009).” The author outline that there are apparent differences between the socio-economic status and the level of child obesity. The author has indicated that low-income earners feed their children with fast food and are never able to offer healthy foods to their children, therefore, making the children prone to childhood obesity. According to Kumanyika & Grier (2006), fast food from the restaurants is given to the children of the people who are low-income earners (Kumanyika & Grier, 2006). The author has indicated that lowest income earners buy the food that is not healthy for the children causing child obesity.

From the Department of Public Health in Los Angeles County, the economic hardship has become a significant challenge on the healthy living among the people. Healthy eating has been associated with high-income earners unlike the low-income earners (Los Angeles County Department of Public Health, 2007). Families need to stretch their income and to depend on the size of their family; they may have to stretch it very thin. The economic hardship can prevent them from purchasing quality foods if they are available in their neighborhood. At times, people have busy schedules that do not allow for cooking. Therefore, they opt for fast food which is much more convenient and inexpensive to them. *"Compared with more affluent communities, minority, and low-income communities have fewer than average supermarkets and convenience stores that stock fresh, good-quality, affordable foods such as whole grains or low-fat dairy products and meats (Kumanyika & Grier, 2006)."*

Children who live in poverty are of the utmost concern because this group may be the most vulnerable in the long term. Childhood obesity is positively correlated with the adult obesity; therefore, the proposed policy should help avoid childhood obesity to reduce the likelihood of increased obesity rates in the future (Los Angeles County Department of Public Health, 2007). The policies directed at children should be similar to those directed at adults, except for the fact that it is much easier to influence children by providing proper high school education, seminars, and training on healthy lifestyles, exercise, and dieting. The poor children, therefore, should be given extra attention in school and encouraged to lead active lifestyles and to participate in various sports activities.

The economic hardship index displays the percentage of obesity prevalence in cities and communities within the Los Angeles County. This data clearly states that where there is a significant economic hardship, there is a high prevalence of obesity. The high percentages are in areas densely populated with minorities due to inequities in access to resources and distribution. The index shows that in 2005, obesity prevalence in the city of Monrovia was at 2.8% as compared to the city of Irwindale at 40.9% (Los Angeles County Department of Public Health, 2007). There are disparities of obesity prevalence throughout the Los Angeles County where economic hardship is high.

The number of different alternatives noted above suggests that once correlation between obesity and socioeconomic status, race, or gender is found, it is possible to quickly and effectively address the problem to benefit that specific group. The fastest and supposedly the most viable option is to tie government benefits and support programs to spending a certain number of hours at the gym or providing food stamps to purchase

healthy foods (fruits, vegetables, etc.), or attending the group therapy and passing a test on how to overcome obesity or lead healthy lifestyles. In this case, people from the low socio-economic class will get encouraged to make positive changes in their lives and thus not only avoid problems related to obesity but will also save tremendous costs for the government that would otherwise be incurred in the future due to correlation between obesity, illnesses and personal bankruptcies due to the inability to afford healthcare. Tying government support to healthy lifestyles, measured by a certain minimum amount of the hours spent in the gym, regular group therapy, and food stamps to get more fruits and vegetables, is the preferred policy recommendation. With all these possible assumptions, without going profoundly in the real causes of obesity, but only correlations, the following hypotheses can be made for Los Angeles County. The Null and alternative hypothesis that will be used in the research as:

The Null Hypothesis - h_0 - *Individuals with economic hardships are not obese in Los Angeles.*

The Alternative Hypothesis- h_1 : *Individuals with economic hardship are more likely to be obese in Los Angeles.*

Section 3: Methodology

The research objective is to explore and examine the statistical probability of a correlation between obesity and low-income individuals/families. The dependent variable for this study is; the prevalence of obesity throughout the cities/communities of the Los Angeles County. This was determined through data collection and analysis. Los Angeles County provides a wealth of data to compare and analyze. Local level statistics were used for this reason. Los Angeles County is comprised of various levels of affluence throughout its cities and communities. It provides the survey with an economic hardship index. The referenced data was collected from the 2005 Census and are organized in the forms of two bar graphs and a scatterplot. The first graph, Graph 1; Distribution of Obesity, is designed such that the x-plane is broken into nine sections starting from 0 to 5, 5 to 10, 10 to 15, 15 to 20, 20 to 25, 25 to 30, 30 to 35, 35 to 40, 40 and over. Each section represents a range of obesity prevalence with each bar representing how many cities fall into that section. According to Graph 1 most cities fall into the 25 to 30 section which means that most cities in the census have an obesity prevalence percentage between 25 and 30. The second graph, Graph 2; Distribution of economic hardship, measures the distribution of economic hardship of the 128 cities censused. Graph 2 measures the economic hardship index utilizing these six indicators; crowded housing, percent of households living below the federal poverty level, percent of persons over the age of 16 years that are unemployed, percent of persons over the age of 25 without a high school education, dependency, and median income per capita to assign a numerical value from 1 to 100 to the city with a higher value representing a greater

level of economic hardship. Graph 2 is designed such that frequency of cities in that economic hardship section is the range with the domain separated into nine sections-based on the economic hardship index starting with 10 to 20, then 20 to 30, 30 to 40, 40 to 50, 50 to 60, 60 to 70, 70 to 80, 80 to 90, and 90 and over. According to the graph the section with the most cities are those with an economic hardship index of 40 to 50.

Lastly, I utilized a linear relationship between obesity prevalence and economic hardship by creating a scatterplot of the 2005 census data using the prevalence of obesity of a city as the y-coordinate and the economic hardship index as the x-coordinate implementing Pearson Correlation. The independent variable is economic hardship, measured throughout Los Angeles County's cities/communities and the dependent variable is the prevalence of obesity, which reflects the greater tendency of low-income individuals to be obese, opposed to middle or upper-class individuals. The hypothesis posits, that as income decreases, the prevalence of obesity increases. Through data analysis and a deductive approach, a correlation between obesity and low-income individuals/families will be evident if it exists.

Section 4: Empirical Findings

Variables

The section will involve analysis of the data obtained and presentation of the data graphically. The data that will be obtained will assist in concluding the research thesis. In the analysis, the data has been obtained from all the relevant departments in Los Angeles and the entire United States of America.

Distribution of Obesity (Graph 1 in Appendix Section)

Obesity has been on the rise in Los Angeles, yet its demographics certainly show some important trends and observations. First of all, the analysis reveals that obesity is a relatively new phenomenon, thus, it affects individuals who have economic hardship. The frequent distribution shows that about 97% of all obese people in the research population has a relationship with economic hardship. The largest groups are ranges 10 to 15 (12%), 20 to 25 (15.6%), and 25 to 30 (34.4%). These findings may suggest that obesity growth in society is due to economic hardship. That is partially why there are so few obese people who do not have an economic hardship. For some reason (still to be determined) they managed to either lead healthy lifestyles or to exercise more or avoid junk foods, unlike their next tier of 25 to 30 range that make up every third obese city or community in our researched population. The sample size was 128, the mean was

22.148, the standard deviation was 7.88, and the variance was 62.14. The information is represented in Graph 1 placed in the appendix.

Distribution of Economic Hardship

Economic hardship although shows slightly different results still appears to be within the similar trend, as shown in Graph 2 in the appendix section. While there are less than 1% of those 10 to 20 cities/communities, who experience economic hardship, the situation changes rapidly with cities/communities and there are 11.7% in the group 20 to 30, 16.4% in the group 30 to 40 and 20.3% (1 in 5) in the group 40 to 50 who experience economic hardship. The sample size is 128, the mean is 52.37, the standard deviation is 18.58, and the variance is 345.258. Such non-existent figures for the range may suggest that the government safety net and other assistance programs help avoid economic hardship, yet this program does not cover them as long as they get into the 20 to 30 tier and get around 12% of those who experience the economic hardship. However, what is the relationship between obesity and economic hardship? To answer that question, it is necessary to compare the two results.

Using the Pearson Correlation, there is some correlation between obesity and the economic hardship level for the Los Angeles population, which, although suggests that poor people are more inclined to be obese, does not provide any explanation. The findings suggest that obesity occurs to individuals with economic hardship (mean=22.148, median=23.8) with a standard deviation of 7.88. It suggests that most obese people (about 68%, assuming a normal distribution) fall within eight

cities/communities (7.88 to be exact) of the mean of the range of 22. Almost all obese people (about 95%) fall within two standard deviations, or range 22.148 +/- 15.76. Statistics for economic hardship, on the other hand, suggest that the population is obese with the mean of 52.377 (median of 51.15) and standard deviation of 18.58. It means that most people (68%) fall within approximately 51 +/- 18 and 95% fall within 51 +/- 36 or two standard deviations.

Dependent Variable

The dependent variable is the prevalence of obesity, which reflects the greater tendency of low-income individuals to be obese, opposed to middle or upper-class individuals. The percentage of obesity, measured by city and community, in Los Angeles County. The data was collected from the 2000 census. The obesity rate is as high as 40% in some local communities. Prevalence of obesity was measured to determine using a body mass index (BMI) of the 142 cities and communities in Los Angeles County. A total of 128 cities/communities with available BMI data were available. These were ranked against one another (Los Angeles County Department of Public Health, 2007). The level of measurement is interval/ratio, and the dependent variable of obesity data is based on quantitative data that has a mean of 22.15 with a standard deviation value 7.88 with a minimum 2.8 and the maximum of 40.9. The mean is the appropriate level of measurement because the Economic Hardship Index is being used and we want to remove any outliers. For example, in all 128 cities researched the minimum percentage of prevalence of obesity was 2.8%. However, of the same cities, the percentage of

prevalence of obesity was at a high or maximum of almost 41%. Looking at a mean of 22%, almost a quarter of the cities are obesity prevalent.

Independent Variable

The independent variable in the research design is the economic hardship level. Economic hardship was measured with indicators, including; evaluating crowded housing, percentage of households who fall under the five base of poverty index, the extent of unemployed people over 16 years of age, percent of those over 25 years of age without a high school education, dependent population who are less than 18 years or above 64 years with the median income per capita. (Los Angeles County Department of Public Health, 2007). The level of measurement is incremental and continuous, illustrated through the order where the index lists cities and communities by economic hardship. Our independent variable utilizes income data ranked in order from least to greatest; therefore, our data measurement is interval/ratio. The data is quantitative; therefore, the mean was calculated to identify the central position of the data set. The mean for our independent variable is 52.37 with a standard deviation of 18.58. The standard deviation measures the distance each value varies from the mean. The minimum value for the independent variable is 16.6, and the maximum is 94.6. The mean is the appropriate measurement because the two variables are continuous and linear.

Section 5: Data Analysis of the Empirical Findings

While theoretical assumptions and individual observations may only offer some suggestions as to whether or not obesity is influenced by socio-economic status, statistical analysis can offer much more accurate and factual information. The Pearson Correlation will demonstrate the strength and direction of the linear relationship between the two continuous variables. Indeed, there appears to be a significant correlation between the previously assumed factors of socio-economic hardship and obesity as observed in Los Angeles.

US Census on Economic Hardship in 2005 (Graph 3 in the Appendix Section)

The Pearson Correlation is a chosen statistical hypothesis testing tool which allows determining the strength and direction of the linear relationship between obesity and economic hardship index. The assumptions were met by having two continuous variables that paired and created a linear relationship which is illustrated in the scatterplot which indicates no significant outliers. This test was chosen because the economic hardship index array1 and obesity array2 returns the coefficient r of 0.788. A default significance level (α) was chosen as 0.05. Since the two variances of obesity and economic hardship differed, the pooled variance was 203.7. There were 171 degrees of freedom. P (p-value) is the probability of seeing the given test statistic as extreme as the other variable that has been obtained on the null hypothesis. The significance level (p-value) of the t-test is what one should pay attention to because if the p-value is less than

0.05, one can conclude that, statistically, the means are significantly different. For two-tailed distribution, the p-level was 1.97, while for the one-tailed distribution the p-level was 1.65 which suggests that the means are not significantly different. Small p-values will offer a considerable doubt about the acceptance of the null hypothesis.

Pagurova has suggested test statistic distribution has greatly depended on the ratio of many unknown variables. So, if Test Statistics (in our case 0.52) has a less Critical Value (for selected alpha, in our case it is 0.143), then the null hypothesis (means are equal) is, therefore, accepted. The statistical findings show that we cannot accept the null hypothesis, but we can accept our hypothesis that obesity and economic hardship are correlated.

The statistical findings do show that the two sets of data show some relationship, yet obesity is distributed more towards economic hardship. One should note that these findings may also pose some new questions for new hypotheses. For instance, the fact that obesity prevalence rapidly drops in certain cities/communities may suggest that people in that area already experience some adverse effects and health problems and, therefore, took some action to lose weight and no longer be considered as obese. At the same time, the growing economic hardship may also suggest that obesity that occurred in some areas and resulted in major health issues that contribute to economic hardship, assuming high healthcare costs and unavailability of free universal healthcare. In other words, we initially assumed that economic hardship could make people work more, spend less time exercising and lead an unhealthy lifestyle which contribute to obesity. The findings although show correlation does not suggest causality.

The findings show a correlation between low socioeconomic status and obesity, yet one cannot determine causality, i.e., which one causes the other. Therefore, to make any model practices of contemporary public-sector administration effective in that context, one needs to explore causality of economic hardship and obesity to know exactly which area to address to yield the maximum results. If obesity is researched to be correlated with economic hardship but caused explicitly by consuming high fat and high sugar foods, it is necessary to provide means to the people to lower their consumption of such foods. This can be achieved through education and various financial incentives, such as coupons to acquire fruits/vegetables. Likewise, if economic hardship is correlated with obesity, but caused by non-healthcare related costs, one may not necessarily have to deal with it at all. If economic hardship figures are found to be caused by skyrocketing healthcare bills, and obesity causes many healthcare issues, from cardiovascular diseases, to diabetes to some cancers, then it is necessary to address obesity in more prevalent areas.

While statistical findings suggest some correlation between obesity and economic hardship and thus support the claim that poor people are more likely to be obese, they do not show causality. Therefore, it is possible that obesity contributes to people's economic hardship later in life as it produces expensive medical bills and it is also possible that economic hardship leaves people less time and resources to lead a healthy lifestyle to avoid obesity. The most effective social programs, first of all, need to determine causative factors and only then work with the leading causes of obesity and economic hardship.

Section 6: Summary, Conclusion, and Policy Implications

Obesity can be reduced by improving socioeconomic conditions. Obesity is an epidemic that affects people of all ages. People affected by obesity are prone to developing chronic diseases such as heart disease and diabetes. Obesity is most prevalent where families experience economic hardship. People that have an economic hardship do not have access or the means to purchase healthy food. Geographically, these prevalent areas do not have access to fitness centers or public park areas that can be used for recreation; making it difficult for them to be physically active. These areas need to be targeted with health intervention and education.

The effective public policy in public sector programs and services should target specific groups and concentrate on their peculiarities. The policy should have many different options for different groups. For example, if it turns out that people do not have money to afford gym membership; the policy should make gyms and coaches more available to low-income families. Some groups, for instance, may not have enough resources to afford healthy foods which include fruits and vegetables. For this group, the policy should present food stamps to get enough fruits and vegetables, but only after they exercise in the gym for a certain number of hours.

Educating the obese people and helping them combat obesity via self-help groups, and group therapy, similar to Alcoholic Anonymous groups should also be a part of an effective policy. Its research proves that obesity relates to economic hardship, the policy should link all various government support programs to overcoming obesity. After all, obesity is positively correlated with various diseases and illnesses, including diabetes or

cancer, so poor obese people increase their likelihood of incurring substantial medical costs without realizing it. Effective programs will re-educate people of low socioeconomic status on how to make the right choices in their lives with respect to maintaining healthy weight, improve the quality of life, reduce the risks of various obesity-related illnesses as well as provide them with the necessary resources to combat obesity (e.g. gym membership, food stamps to get fruits, group therapy, etc.).

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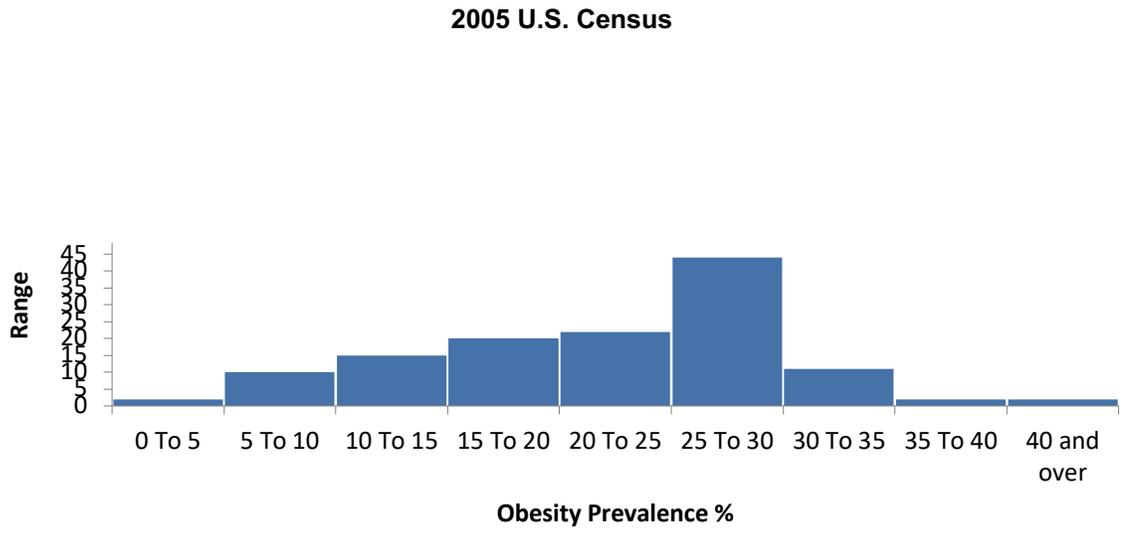
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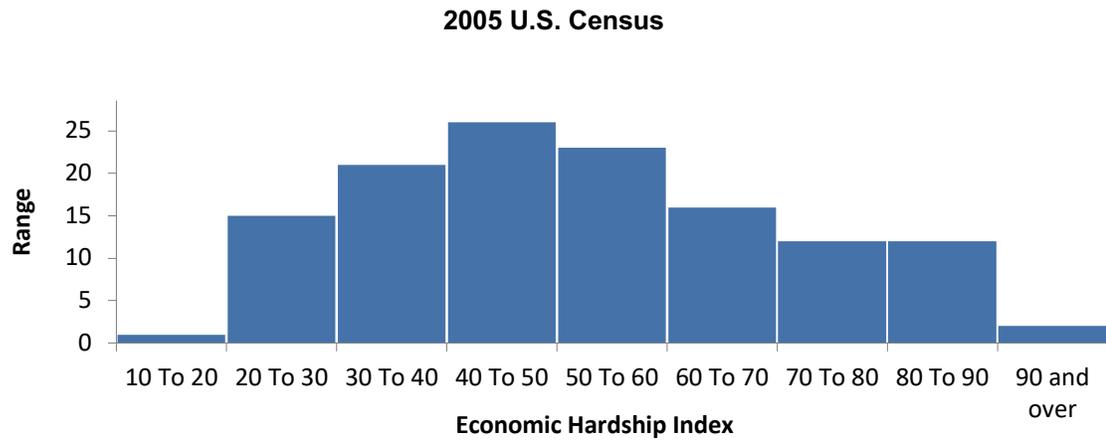
Appendix A

Graph 1. Distribution of obesity.



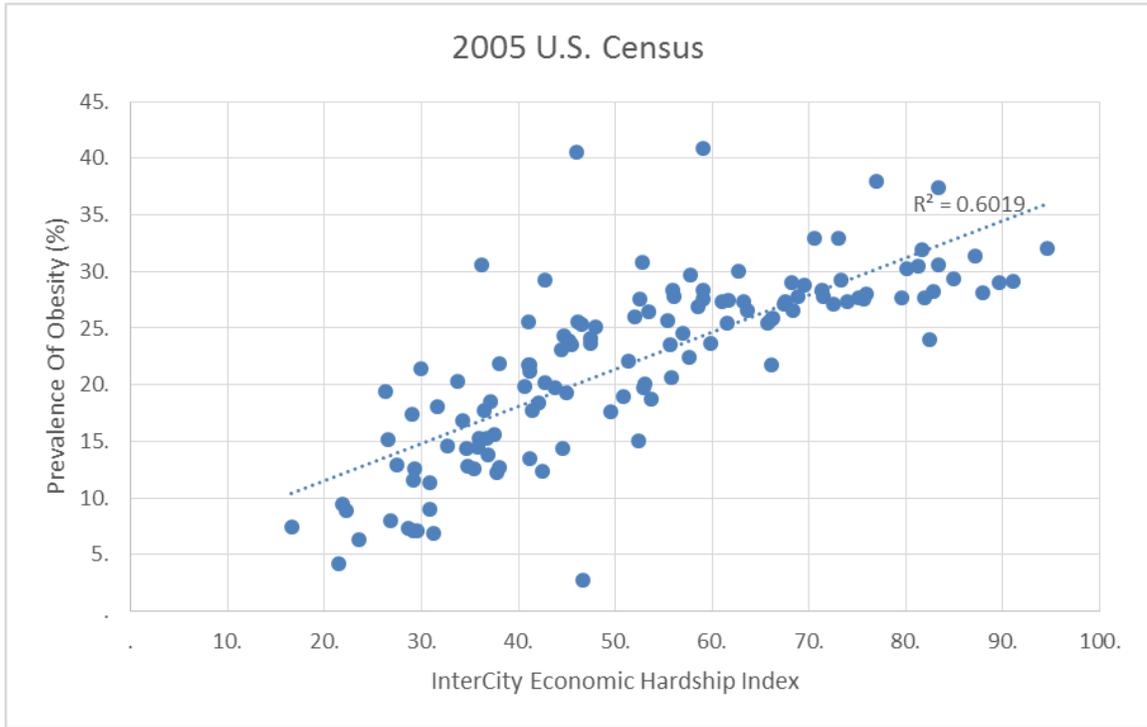
Appendix B

Graph 2. Distribution of economic hardship.



Appendix C

Graph 3



Appendix D

Table 1

Pearson Correlation R	.78
Coefficient Determination r^2	.61
Coefficient Alienation $1-r^2$	1-.61
P Value	.39