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*Virginia Commonwealth University*

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Title Page  
Master of Public Health Research Project

*Obesity and Health Status among Urban vs. Suburban Elderly living  
in Philadelphia and Surrounding Counties*

by

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MPH Research Project: PMCH 691

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## **ABSTRACT**

Obesity is a dangerous health condition affecting approximately 30% of all Americans and can be attributed to 300,000 deaths a year. Obesity has been found to disproportionately affect Blacks, Latinos, and those with lower SES. Although obesity is a problem for all age groups, its prevalence is highest among those 60-74 years of age. Studies have shown that there is an association between obesity and chronic conditions such as cardiovascular disease, arthritis, cancers, and type-2 diabetes. According to the Centers for Disease Control, chronic health conditions affect 80% of all elderly persons, many times limiting function and decreasing quality of life. This study attempted to find a relationship between obesity and chronic conditions among 1,053 elderly living in Philadelphia and 1,648 elderly living in Bucks, Chester, Delaware, and Montgomery counties. This study also examined the risk for having a chronic condition associated with living in Philadelphia compared to living in the four surrounding counties. Data from the 2002 Household Survey conducted by the Philadelphia Health Management Corporation was used to examine the relationship between obesity and chronic conditions and it was found that obesity was significantly related to having a chronic condition among elderly in both the city and suburbs. Specifically, obesity was related to diabetes, asthma, arthritis, and heart conditions for persons over 60 living in the city and suburbs with an additional association with allergies for elderly living in the city. It was also found that living in the city of Philadelphia was significantly associated with a 50% increased chance for diabetes among persons 60 and over. Future research should first be conducted to design a BMI scale that reflects the decrease in muscle and bone mass associated with aging. After a new scale is devised, research should continue to further investigate the association between obesity and various chronic conditions in the elderly.

## INTRODUCTION

In the United States, obesity has been described as a problem of epidemic proportions (18). Thirty percent of all Americans are considered obese, and there are an estimated 300,000 deaths a year attributed to obesity (21). It was found that being obese could increase one's risk of all-cause mortality by 92% when compared to normal weight individuals (25). Obesity has become such a problem; the Surgeon General has suggested it be labeled a disease (11). Obesity is usually defined as having a body mass index of 30 or more with normal weight individuals having a BMI of 20-24.9. Those in the 25-29.9 range are considered overweight and those with a BMI of less than 20 are considered underweight. Obesity is known to disproportionately affect Blacks, Latinos, and those with lower socioeconomic status (26). The prevalence of obesity increases with age, with the highest prevalence being among men and women between 55 and 74 years of age (CDC).

Obesity has been associated with many chronic health conditions such as hypertension (20), diabetes mellitus (3), asthma (8), cancer (4), osteoarthritis (19), and cardiovascular disease (14). A study conducted by Clark and Mungai compared chronic disease prevalence and severity, pain, sensory deficits, and mobility difficulty across four categories of BMI: 19-24, 25-29, 30-34, and 35 or more. The study found that African American women 30-70 years of age with a BMI of 35 or more reported significantly more frequent and severe hypertension, diabetes, cancer, heart disease, arthritis, and mobility difficulties than those women with a BMI of 25-29 (5).

Mokdad et al studied the association between obesity and a variety of chronic conditions. The study used subjects from all states aged 18 and older participating in the

Behavioral Risk Factor Surveillance System in 2001. It was found that when compared to normal weight adults, obese adults with a BMI of 40 or more had 7.37 times the risk for diagnosed diabetes, 6.38 times the risk for high blood pressure, 1.88 times the risk for high cholesterol, 2.72 times the risk for asthma, and 4.19 times the risk for arthritis (17).

Various studies have been performed measuring the association between obesity and individual chronic conditions. Researchers at Boston University's School of Medicine assessed the relationship between BMI and hypertension. This study also used women as its subjects, but these women were between the ages of 21-69 and college educated. It was found that women with a BMI of 27.3-32.3 (overweight) had 2.7 times the risk of hypertension while obese women (BMI= 32.3 +) were 4.9 times more likely to be diagnosed with hypertension (23).

The association between obesity and hypertension appears to hold true across the globe. A study conducted by Kaufman et al measured this association among Blacks from the Caribbean, Africa, and the United States. The study found that both overweight and obese Blacks had adjusted relative risks of between 1.3 and 2.3 (15).

The association between obesity and heart disease has also been widely studied. Folsom et al studied the relationship between incidence of coronary heart disease and BMI among African-Americans and Whites. The studies measured relative risks across quartiles of body mass index. It was found that subjects in the highest quartiles had the highest relative risks of CHD. Relative risks for both Whites and African-Americans were similar with women in the highest BMI quartile having a relative risk of 2.15 and men in the highest BMI quartile having relative risks of 1.2 (7).

A second study conducted by Folsom et al examined the relationship between obesity and cardiovascular disease in a population of young and middle-aged Black adults. For this study, the researchers used skinfold measurements instead of body mass index to measure obesity. After adjusting for age and smoking, it was found that obese men and women had a 30% increase in risk for cardiovascular disease (6).

Arthritis is another chronic health condition found to be associated with obesity. A study conducted by German researchers assessed the association between obesity and osteoarthritis of the hip, knee, and hand. Although there was no association found between obesity and bilateral hip osteoarthritis nor generalized osteoarthritis, there was an association found between both overweight and obesity and bilateral knee osteoarthritis. Being overweight increased risk of osteoarthritis 5.9 times and being obese increased risk 8.1 times (24).

A study conducted by Oliveria et al also measured the association between obesity and osteoarthritis of the hip, knee, and hand. Unlike the German study, Oliveria et al found a positive association between obesity and osteoarthritis in all three joints. The study found that women aged 20-89 in the upper tertile of weight had odds ratios of between 3.0 and 10.5 when compared to women in the lower tertile. Similar results were found when subjects were compared by body mass index (22).

Not only has obesity been found to increase one's chances of having a chronic condition, obesity has also been associated with functional limitations and a decreased quality of life in later years of life. A study by Himes found that obesity is related to limitations in activities of daily living for women and activities related to mobility (12). Lijing et al found that after adjusting for age, race, education, smoking, and alcohol

intake, obesity was associated with lower physical functioning among women aged 65 and older and that being overweight impaired physical well-being in older women as well (16). These results were consistent with a study conducted by Kahng, Dunkle, and Jackson which found that elders with greater body weight had increased functional disability as well as increased chronic health conditions (13).

There appears to be little doubt that obesity is associated with an increased risk for chronic health conditions. The negative effects of obesity are clear in younger adults and children, but there is some debate about obesity's effect in the elderly. Some researchers believe that being underweight is of more concern when assessing health and mortality of older adults. The purpose of this study is to examine the association between obesity and chronic conditions among elderly living in the Philadelphia Metropolitan area. This association will be measured independently for subjects living in the city of Philadelphia compared to subjects living in the surrounding counties. Also, this study will investigate if there is an increased risk for chronic conditions for those subjects living in the city of Philadelphia when compared to those living in the suburbs of the surrounding counties.

## **METHODOLOGY**

### ***SUBJECTS***

The study population consisted of 472,926 respondents 60 years of age or older living in Philadelphia and its surrounding counties of Bucks, Chester, Delaware, and Montgomery counties. The data set was collected from the 2002 Household Survey

conducted by the Philadelphia Health Management. The survey was conducted by phone using random digit dialing. The overall survey included persons 18 years of age or older, but there was an over-sample consisting of persons 60 years of age or older. The older adult questionnaire asked unique questions geared toward examining the health status and health behaviors of older persons in the five county region. For use of this study, a computer generated, randomly selected subset of 2,701 subjects was used. The subset contained twenty-six selected data fields for each subject to be used in this study.

The study examined the relationship between obesity and one's chances of having a chronic condition. There were potential confounders that were accounted for in analyses. These variables included: smoking, being exposed to secondhand smoke, having been diagnosed with either high blood pressure or high blood cholesterol, residence (city or suburbs), race, educational attainment, income, age, gender, marital status, and perceived stress.

### **CHRONIC CONDITIONS, STRESS, OBESITY STATUS, AND RESIDENCE**

For this study, a chronic condition referred to a condition that could be managed over a number of years with the aid of medical intervention. This study defined a variable of chronic condition to include all respondents who reported any one of six conditions, to include: asthma, arthritis, allergies, cancer, heart condition, and diabetes. Stress in this study was actually the perceived stress level of each subject. A perceived stress level of 0 would be equal to no stress, while a perceived stress level of 10 would be equal to maximum stress. Stress levels were then recoded into the following categories:

0-3= low stress, 4-7= medium stress, and 8-10= high stress. Obesity was defined as having a BMI of greater than or equal to 30. Residence was defined as living in either the city (Philadelphia) or the suburbs (Bucks, Chester, Delaware, and Montgomery counties).

## **STATISTICAL ANALYSIS**

Statistical analysis was performed using SPSS statistical software and Epi Info 2003. Analysis began with a bivariate analysis of data using SPSS. This bivariate analysis was used to calculate a frequency table consisting of the number of subjects in each variable category along with the corresponding proportions. Frequencies and proportions were next calculated for each chronic condition.

Next, the prevalence of having a chronic condition for each stratum within each variable category was calculated and put into a table. A chi-square test was then performed on each variable category to examine the relationship between the corresponding category and a subject having a chronic condition. Both calculations were computed separately for subjects living in the city and subjects living in the suburbs.

Chi-square tests were next used to examine the relationship between obesity and individual chronic conditions. Chi-square and p-values were calculated and placed into a table separated by residence. Lastly, prevalence odds ratios for the six individual chronic conditions were calculated to measure the increased risk associated with living in the city compared to living in the suburbs. A 2x2 table was created for each condition using the suburbs as the reference group. All tests were measured with a confidence level of 95%.

## RESULTS

As Table 1 shows, the highest proportion of our study population were white (74.4%), non-smoking (88.4%), female (65.9%), high school graduates (41.7%) living in Philadelphia. The highest proportion of respondents were also age 60-65 (28.1%), married (42.4%), and had an annual income of \$14,250 to \$38,000 (20%). Of the 2,701 subjects selected for the study, 666 (24.7%) were obese. In terms of chronic conditions, Table 2 shows that most subjects had arthritis (n=1395, 51.6%) followed by allergies (n=745, 27.6%) then a heart condition (n=606, 22.4%). Cancer (n=147, 5.4%) was the least reported chronic condition.

Table 3 shows the prevalence for chronic conditions within each variable category for the total population. Table 3 also shows which of these categories were significantly related to having a chronic condition. It was found that residence ( $p=.00$ ), smoking ( $p=.03$ ), race ( $p=.00$ ), perceived stress ( $p=.00$ ), income ( $p=.00$ ), gender ( $p=.00$ ), obesity ( $p=.00$ ), high blood pressure ( $p=.00$ ), and high blood cholesterol ( $p=.00$ ) were all significantly related to obesity. Persons living in the suburbs showed a decreased risk for chronic conditions compared to persons living in the city (OR 0.74, 0.63-0.86). Obesity increased the risk for chronic conditions in the total population by 51% (OR 1.51, 1.26-1.80).

Table 4 shows the prevalence of having any chronic condition within each stratum of the chosen variable categories as well as which variable categories are significantly related to having a chronic condition. Among elderly living in both the city and the suburbs, obesity ( $p=.00$  and  $p=.03$ , respectively), high blood pressure ( $p=.00$ ), high blood cholesterol ( $p=.00$ ), and perceived stress ( $p=.00$ ) were all significantly associated with

having a chronic condition. As seen in Table 4, persons who were obese and living in the city were 72% more likely to have a chronic disease (OR 1.72, 1.3-2.3). However, there were two differences between the groups. First, elderly subjects living in the city showed an association between income and having a chronic condition ( $p=.03$ ). Second, although males showed a higher prevalence of chronic conditions than females in both the suburbs and the city, the increased risk was only significant among those living in the suburbs (OR 1.39, 1.12-1.71,  $p=.00$ ).

Table 5 shows the association between various chronic conditions and obesity for persons living in the city and the suburbs. Diabetes ( $p=.00$ ), asthma ( $p=.00$ ), arthritis ( $p=.00$ ), heart conditions ( $p=.01$ ), and allergies ( $p=.03$ ) were all significantly associated with obesity among elderly living in the city. Among these conditions, obesity significantly increased the risk for arthritis the most (OR 2.73, 2.04-3.65) followed by diabetes (OR 2.56, 1.88-3.49) and asthma (OR 2.54, 1.67-3.85). For those living in the suburbs, obesity was associated with diabetes ( $p=.00$ ), asthma ( $p=.01$ ), arthritis ( $p=.00$ ), and heart conditions ( $p=.00$ ). As was true of elderly in the city, obese persons in the suburbs were most likely to be diagnosed with arthritis (OR 2.38, 1.87-3.04). Cancer was not significantly related to obesity in either group.

Table 6 shows prevalence odds ratios for each chronic condition by residence. As seen, living in the city appears to be a significant factor only for diabetes, with persons living in the city at a 50% increased risk for the disease.

## DISCUSSION

The association between obesity and chronic conditions has been well documented. Prior research has suggested that there is a definite relationship between obesity and many chronic conditions. It has been found that obese individuals often suffer from health problems such as diabetes (3), asthma (8), cancer (4), osteoarthritis (19), and heart disease (14). This study supports this claim for four of the five conditions listed above. Using a random sample of 2,701 subjects living in Southeastern Pennsylvania, analyses were run that produced results showing a relationship between obesity and the following conditions for elderly living in the city: diabetes, asthma, arthritis, heart conditions, and allergies. These relationships also held true for elderly living in the suburbs with the exception of allergies. No relationship was found between obesity and cancer in either group. It was also found that elderly living in the city of Philadelphia were at increased risk for diabetes when compared to elderly living in the suburbs surrounding Philadelphia. Living in the city was associated with a 50% increased chance for diabetes among persons over 60.

There were many limitations to this study. One of the most significant limitations involved the method of data collection. The sickest and oldest elderly were more than likely underrepresented due to the usage of phone surveys. Also, most of these phone interviews were conducted in English, with a few Spanish interviews mixed in. This language barrier would eliminate almost all non-English speaking elderly.

Another limitation to this study is the use of BMI as a measure of obesity. BMI may not be the best way to measure body weight because it does not take into consideration body composition. At different points in life, the body may be composed

of varying percentages of bone and muscle tissue in relation to fat tissue (10). As we age, there is a decrease in bone and muscle mass with an increase in abdominal fatness (1). BMI also does not take into account fat distribution. Lastly, the BMI measures used in this study are all calculated from self-reported weight and height. Self-reporting can always lead to inaccuracies, however, a study by Bowman and DeLucia 1992 showed that there is a strong correlation between measured and self-reported weights (2).

Lastly, this study included a limited number of chronic conditions. The six categories of chronic conditions used for this study encompass many specific diseases, but many are missing. Among those missing are non-asthma pulmonary diseases. Limiting the number of chronic conditions may have underestimated the association with obesity.

There were, however, strengths associated with this study. One of the most important was adjusting for possible covariates using logistic regression. The number of subjects used gives fairly good power to the study, allowing for the detection of a difference between obese and non-obese subjects if one exists. Random selection of subjects gives good generalizability for elderly living in the five county region as is evidenced by a fairly uniform distribution of individuals within the total, diseased (condition present), and non-diseased (condition absent) populations. The only characteristics that showed a difference in distribution between the groups were education, high blood pressure, and high cholesterol.

Although it is not possible to tell cause and effect, results of this study show a definite relationship between obesity and some chronic conditions among the elderly living in the city of Philadelphia and the counties of Bucks, Montgomery, Delaware, and

Chester. Results also show that there may be an increased health risk associated with living in the city for the elderly. Research should continue to be performed to thoroughly measure the association between obesity and chronic conditions in the elderly. Future research should disregard younger adults and concentrate on the elderly. It would first be best if research were conducted to design an adequate BMI scale specifically designed for the elderly, which reflects the decrease in muscle and bone mass associated with aging. Also, a study by Galanos et al. found an association between both high and low BMI and a decrease in functional status among the elderly (9). From this, further investigation should be made into the association between being underweight and risk for chronic conditions among the elderly.

# **Appendix A**

**Table 1. Subject Frequencies**

<i>Variable</i>	<i>Total</i>		<i>Variable</i>	<i>Total</i>	
	N	%		N	%
<b>Residence</b>			<b>Education (grade level)</b>		
Suburbs	1648	61	0-11	514	19
City	1053	39	12	1126	41.7
<b>Obese</b>			13-15	434	16.1
Yes	666	24.7	16	336	12.4
No	1998	74	16+	269	10
<b>Race</b>			Unknown	22	0.8
White	2010	74.4	<b>Marital Status</b>		
Black	514	19	Married	1145	42.4
Latino/Hispanic	67	2.5	Living with Partner	29	1.1
Other	66	2.4	Widowed	955	35.4
Unknown	4	1.6	Divorced	227	8.4
<b>Gender</b>			Separated	84	3.1
Male	922	34.1	Single	248	9.2
Female	1779	65.9	Other	2	0.1
<b>Age (years)</b>			Unknown	11	0.4
60-65	758	28.1	<b>Income</b>		
66-70	555	20.5	<\$14,250	479	17.7
71-75	500	18.5	\$14,250 up to \$38,500	541	20
76-80	470	17.4	\$38,500 up to \$80,000	393	14.6
81+	418	15.4	\$80,000+	323	12
<b>Smoke</b>			Unknown	965	35.7
Yes	311	11.5			
No	2388	88.4			
Unknown	2	0.1			

**Table 2. Chronic Condition Frequencies**

<i>Variable</i>	<i>Total</i>		
	<i>N</i>	<i>%</i>	
Allergies	Yes	745	27.6
	No	1936	71.7
	Unknown	20	0.7
Asthma	Yes	223	8.3
	No	2471	91.5
	Unknown	7	0.3
Arthritis	Yes	1395	51.6
	No	1293	47.9
	Unknown	13	0.5
Cancer	Yes	147	5.4
	No	2541	94.1
	Unknown	13	0.5
Heart Condition	Yes	606	22.4
	No	2076	76.9
	Unknown	19	0.7
Diabetes	Yes	5	16.9
	No	2240	82.9
	Unknown	456	0.2

**Table 3. Prevalence of Chronic Conditions**

<i>Variable</i>	<i>Chronic Condition Absent (N)</i>	<i>Chronic Condition Present (N)</i>	<i>Prevalence (%)</i>	<i>p=</i>	<i>POR(95% CI)</i>
<b>Obese</b>				0.00	0.74 (0.63, 0.86)
Yes	336	328	49.4		
No	561	782	39.3		
<b>Residence</b>				0.03	0.97 (0.76, 1.23)
Suburbs	998	642	39.1		
City	561	490	46.6		
<b>Race</b>				0.00	
White	1200	801	40		
Black	263	250	48.7		
Latino/Hispanic	32	35	52.2		
Other	43	23	34.8		
<b>Perceived Stress</b>				0.00	
Low	836	469	35.9		
Mid	492	399	44.8		
High	149	168	53		
<b>Income</b>				0.00	
<\$14,250	238	241	50.3		
\$14,250 up to \$38,500	324	215	39.9		
\$38,500 up to \$80,000	226	165	42.2		
\$80,000 up to \$100,000	81	58	41.7		
\$100,000+	116	65	35.9		
<b>Gender</b>				0.00	1.31 (1.12, 1.54)
Male	491	426	46.5		
Female	1068	706	39.8		
<b>High Blood Pressure</b>				0.00	2.51 (2.14, 2.94)
Yes	706	764	52		
No	852	368	30.2		
<b>High Blood Cholesterol</b>				0.00	1.73 (1.48, 2.02)
Yes	621	603	49.3		
No	933	524	36		

**Table 4. Chronic Condition Associations by Residence**

Variable	CITY					SUBURBS				
	Total (N)	Chronic Condition (N)	Prev (%)	p=	POR (95%CI)	Total (N)	Chronic Condition (N)	Prev (%)	p=	POR (95%CI)
<b>Obese</b>				0.00	1.72 (1.31, 2.25)				0.03	1.3 (1.03, 1.65)
Yes	305	171	56.1			359	157	43.7		
No	734	313	42.6			1256	626	49.8		
<b>HBP</b>				0.00	2.51 (1.94, 3.25)				0.00	2.42 (1.98, 2.97)
Yes	639	354	55.4			831	410	49.3		
No	411	136	33.1			809	232	28.7		
<b>HBC</b>				0.00	1.89 (1.48, 2.42)				0.00	1.65 (1.35, 2.01)
Yes	474	262	55.7			750	341	45.5		
No	574	227	39.5			883	297	33.6		
<b>Perceived Stress</b>				0.00					0.00	
Low	516	200	38.8			789	269	34		
Mid	322	161	50			569	238	41.8		
High	131	82	62.6			186	86	46.2		
<b>Gender</b>				0.10					0.00	1.39 (1.13, 1.70)
Male	338	170	50.3			579	256	44.2		
Female	713	320	44.9			1061	386	36.4		
<b>Income</b>				0.03					0.35	
<\$14,250	280	153	54.6			199	88	44.2		
\$14,250-\$38,500	216	89	41.2			323	126	39		
\$38,500-\$80,000	114	49	43			277	116	41.9		
\$80,000-\$100,000	43	19	44.2			96	39	40.6		
\$100,000+	41	18	43.9			140	47	33.6		

**Table 5. Association Between Obesity and Chronic Conditions**

	<i>CITY</i>				<i>SUBURBS</i>			
	<i>Obese</i>		<i>POR (95% CI)</i>	<i>p=</i>	<i>Obese</i>		<i>POR (95% CI)</i>	<i>p=</i>
	<i>Yes (%)</i>	<i>No (%)</i>			<i>Yes (%)</i>	<i>No (%)</i>		
<b>Diabetes</b>	46.1	53.9	2.56 (1.88, 3.49)	0.00	42.4	57.6	1.23 (0.95, 1.6)	0.00
<b>Asthma</b>	48.5	51.5	2.54 (1.67, 3.85)	0.00	32.2	67.8	1.74 (1.16, 2.62)	0.01
<b>Arthritis</b>	37.8	62.2	2.73 (2.04, 3.65)	0.00	29.7	70.3	2.38 (1.87, 3.04)	0.00
<b>Heart Condition</b>	35.8	64.2	1.46 (1.08, 1.99)	0.00	27.8	72.2	1.48 (1.13, 1.94)	0.00
<b>Allergies</b>	33.9	66.1	1.37 (1.02, 1.83)	0.03	24.8	75.2	1.23 (0.95, 1.60)	0.11
<b>Cancer</b>	27.3	72.7	0.90 (0.49, 1.65)	0.73	26.1	73.9	1.25 (0.77, 2.02)	0.36

**Table 6. Risk Associated with Living in the City**

<i>Condition</i>	<i>CITY Prevalence (%)</i>	<i>SUBURBS Prevalence (%)</i>	<i>POR</i>	<i>95% CI</i>
Diabetes	21.2	14.2	1.5*	(1.2, 1.8)
Asthma	9.8	7.3	1.4	(1.0, 1.8)
Arthritis	56.6	48.9	1.2	(1.0, 1.3)
Heart Condition	29.1	27	1.1	(0.9, 1.3)
Allergies	23.4	22.1	1.1	(0.9, 1.3)
Cancer	5.3	5.6	0.9	(0.7, 1.3)

\**p-value*= .00

# *Appendix B*

TITLE "OBESITY AND CHRONIC DISEASE".

RECODE

county  
(5=2) (1 thru 4=1) INTO county1 .  
VARIABLE LABELS county1 'residence'.

EXECUTE .

RECODE

obesity  
(4=1) (1 thru 3=2) INTO obesity1 .  
VARIABLE LABELS obesity1 'obesity status'.

EXECUTE .

RECODE

stress  
(1 thru 3=1) (4 thru 7=2) (8 thru 10=3) INTO stress1 .  
VARIABLE LABELS stress1 'perceived stress level'.

EXECUTE .

RECODE

income  
(15=4) (1 thru 4=1) (5 thru 11=2) (12 thru 14=3)  
(16 thru 17=5) INTO income1 .  
VARIABLE LABELS income1 'recoded income levels'.

EXECUTE .

RECODE

racea2  
(1=1) (2=2) (3=3) (4 thru 6=4) INTO race1 .  
VARIABLE LABELS race1 "respondent's race".

EXECUTE .

VALUE LABELS

county1 1 'suburbs' 2 'city'  
/race1 1 'white' 2 'black' 3 'latino/hispanic' 4 'other'  
/stress1 1 'low stress' 2 'moderate stress' 3 'high stress'  
/obesity1 1 'yes' 2 'no'  
/income1 1 'less than \$14,250' 2 '\$14,250 up to \$38,500' 3 '\$38,500 up to \$80,000' 4 '\$80,000  
up to \$100,000'  
5 '\$100,000+'  
/sex01 1 'male' 2 'female'  
/agec1 1 '60-65' 2 '66-70' 3 '71-75' 4 '76-80' 5 '81-85' 6 '86-90' 7 '91-105'

FREQUENCIES

VARIABLES=county county1 sex01 chronica allergya arthrit asthmaa cancer heartcon  
diabeta highbp highbc hsmoke smoke respgrad respmar race1 agec1  
stress1 income1 obesity1 obesity  
/ORDER= ANALYSIS .

Temporary.

Select if chronica=1.

FREQUENCIES

VARIABLES=county county1 sex01 highbp highbc hsmoke smoke respgrad respmar race1  
agec1  
stress1 income1 obesity1 obesity

Temporary.

Select if chronica=2.

FREQUENCIES

VARIABLES=county county1 sex01 highbp highbc hhs smoke respgrad respmar race1  
agec1  
stress1 income1 obesity1 obesity

CROSSTABS

/TABLES=sex01 obesity obesity1 highbp highbc county1 hhs smoke respgrad respmar  
race1 agec1 income1 stress1 BY chronica  
/TABLES=allergya arthrit asthma cancer heartcon diabeta highbp highbc BY county1  
/FORMAT= AVALUE TABLES  
/STATISTIC=RISK  
/CELLS= COUNT ROW .

Temporary.

Select if county1=1.

CROSSTABS

/TABLES=obesity1 obesity highbp highbc smoke hhs smoke stress1 income1 respgrad respmar  
race1 sex01 agec1 allergya  
arthrit asthma cancer heartcon diabeta BY chronica  
/FORMAT= AVALUE TABLES  
/STATISTIC=RISK  
/CELLS= COUNT ROW .

Temporary.

Select if county1=2.

CROSSTABS

/TABLES=obesity1 obesity highbp highbc smoke hhs smoke stress1 income1 respgrad respmar  
race1 sex01 agec1 allergya  
arthrit asthma cancer heartcon diabeta BY chronica  
/FORMAT= AVALUE TABLES  
/STATISTIC=RISK  
/CELLS= COUNT ROW .

CROSSTABS

/TABLES=county1 BY chronica  
/FORMAT= AVALUE TABLES  
/STATISTIC=CHISQ  
/CELLS= COUNT .

Temporary.

Select if county1=1.

CROSSTABS

/TABLES=agec1 respgrad respmar smoke hhs smoke race1 stress1 income1 sex01  
obesity1 highbp highbc BY chronica  
/FORMAT= AVALUE TABLES  
/STATISTIC=CHISQ RISK  
/CELLS= COUNT .

Temporary.

Select if county1=2.

CROSSTABS

/TABLES=agec1 respgrad respmar smoke hhs smoke race1 stress1 income1 sex01  
obesity1 highbp highbc BY chronica  
/FORMAT= AVALUE TABLES  
/STATISTIC=CHISQ RISK  
/CELLS= COUNT .

CROSSTABS

```
/TABLES=county1 agec1 respgrad respmar smoke hhsmove race1 stress1 income1 sex01  
obesity1 highbp highbc BY chronica  
/FORMAT= AVALUE TABLES  
/STATISTIC=CHISQ RISK  
/CELLS= COUNT .
```

Temporary.

Select if county1=1.

CROSSTABS

```
/TABLES=allergya arthrit asthma cancer heartcon diabeta BY obesity1  
/FORMAT= AVALUE TABLES  
/STATISTIC=CHISQ RISK  
/CELLS= COUNT ROW COLUMN .
```

Temporary.

Select if county1=2.

CROSSTABS

```
/TABLES=allergya arthrit asthma cancer heartcon diabeta BY obesity1  
/FORMAT= AVALUE TABLES  
/STATISTIC=CHISQ RISK  
/CELLS= COUNT ROW COLUMN .
```

## REFERENCES

1. Baumgartner, Richard N., Steven B. Heymsfield, and Alex F. Roche. 1995. "Human Body Composition and the Epidemiology of Chronic Disease." *Obesity Research* 3: 73-95.
2. Bowman, Robert L. and Janice L. DeLucia. 1992. "Accuracy of Self-Reported Weight: A Meta-Analysis." *Behavior Therapy* 23: 637-55.
3. Black, Sandra A. 2002. "Diabetes, Diversity, and Disparity: What Do We Do With the Evidence?" *American Journal of Public Health* 92: 543-48.
4. Calle, Eugenia E., Thun, Michael J., Petrelli, Jennifer M., Rodriguez, Carmen, and Heath, Clark. 1999. "Body Mass Index and Mortality in a Prospective Cohort of U.S. Adults." *New England Journal of Medicine* 341: 1097-1105.
5. Clark DO, Mungai SM. 1997. "Distribution and association of chronic disease and mobility difficulty across four body mass index categories of African-American women." *American Journal of Epidemiology* 145(10): 865-75.
6. Folsom AR, Burke GL, Byers CL, Hutchinson RG, Heiss G, Flank JM, Jacobs DR Jr., and Caan B. 1991. "Implications of obesity for cardiovascular disease in Blacks: the CARDIA and ARIC studies." *American Journal of Clinical Nutrition* 53(6 Suppl): 1604S-1911S.
7. Folsom AR, Stevens J, Schreiner PJ, and McGovern PG. 1998. "Body mass index, waist/hip ratio, and coronary heart disease incidence in African Americans and Whites." *American Journal of Epidemiology* 148(12): 1187-94.
8. Ford, Earl, David Mannino, Stephen Redd, Ali Mokdad, Deborah Galuska, and Mary Serdula. 2003. "Self-Reported Asthma and Health-Related Quality of Life: Findings from the Behavioral Risk Factor Surveillance System." *Obesity Research* 11: 81-6.
9. Galanos, A.N., Pieper, C.F., Cornoni-Huntley, J.C., Bales, C.W., and Fillenbaum, G.G. 1994. "Nutrition and Function: Is there a Relationship between Body Mass Index and the Functional Capabilities of Community Dwelling Elderly?" *Journal of the American Geriatric Society* 42: 368-373.
10. Gallagher, Dymrna, Marjolein Visser, Dennis Sepulveda, Richard N. Pierson, Tamara Harris, and Steven B. Heymsfield. 1994. "How Useful is Body Mass Index for Comparison of Body Fatness Across Age, Sex, and Ethnic Groups?" *American Journal of Epidemiology* 143: 228-39.
11. Hellmich, Nanci. "Weighing the cost of obesity." USA Today 20 Jan. 2002.
12. Himes, Christine L. 2000. "Obesity, disease, and functional limitation in later life." *Demography* 37(1): 73-82.
13. Kahng, S.K., Dunkle, R.E., Jackson, J.S. 2004. "The Relationship between the Trajectory of Body Mass Index and Health Trajectory Among Older Adults." *Research on Aging* 26(1): 31-61.
14. Kannel, W. 1997. "Effect of Weight on Cardiovascular Disease." *Nutrition* 13: 157-58.
15. Kaufman JS, Durazo-Arvizu RA, Rotini CN, McGee DL, and Cooper RS. 1996. "Obesity and hypertension prevalence in populations of African origin. The Investigators of the International Collaborative Study on Hypertension in Blacks." *Epidemiology* 7(4): 398-405.

16. Lijing, YL, Martha L. Daviglus, Kiang Liu, Amber Pirzada, Daniel B. Garside, Linda Schiffer, Alan R. Dyer, and Philip Greenland. 2004. "BMI and Health-Related Quality of Life in Adults 65 Years and Older." *Obesity Research* 12: 69-76.
17. Mokdad, AH, Ford ES, Bowman BA, Dietz WH, Vinicor F, Bales VS, and Marks JS. 2003. "Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001." *Journal of the American Medical Association* 289(1): 76-9.
18. Mokdad, Ali H., Mary K. Serdula, William H. Dietz, Barbara A Bowman, James S. Marks, and Jeffrey P. Koplan. 1999. "The Spread of the Obesity Epidemic in the United States, 1991-1998." *Journal of the American Medical Association* 282: 1519-22.
19. Must, A., Spadano, J., Coakley, E.H., Field, A.E., Colditz, G., and Dietz, W.H. 1999. "The Disease Burden Associated with Overweight and Obesity." *Journal of the American Medical Association* 282(16): 1523-9.
20. Nelson, Tracy L., Kelly J. Hunt, Wayne D. Rosamond, Alice S. Ammerman, Thomas C. Keyserling, Ali H. Mokdad, and Julie C. Will. 2002. "Obesity and Associated Coronary Heart Disease Risk Factors in a Population of Low-Income African American and White Women: The North Carolina WISEWOMAN Project." *Preventive Medicine* 35: 1-6.
21. Oliver, J. E. and Lee, T. 2002. "Public Opinion and the Politics of America's Obesity Epidemic." Submitted to *American Journal of Political Science* 6 May.
22. Oliveria, SA, Felson DT, Cirillo PA, Reed JI, and Walker AM. 1999. "Body weight, body mass index, and incident symptomatic osteoarthritis of the hand, hip, and knee." *Epidemiology* 10(2): 161-6.
23. Rosenberg L, Palmer JR, Adams-Campbell LL, and Rao RS. 1999. "Obesity and hypertension among college-educated Black women in the United States." *Journal of Human Hypertension* 13(4): 237-41.
24. Sturmer T., Gunther K.P., and Brenner H. 2000. "Obesity, overweight and pattern of osteoarthritis: the Ulm Osteoarthritis Study." *Journal of Clinical Epidemiology* 53(3): 307-13.
25. Thorpe, R.J., Ferraro, K.F. 2004. "Aging, Obesity, and Mortality." *Research on Aging* 26(1): 108-129.
26. Wardle, J., Waller, J, and Jarvis, M.J. 2002. "Sex Differences in the Association of Socioeconomic Status with Obesity." *American Journal of Public Health* 92(8): 1299-1303.