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Why Are Some States More Obese Than Others: A State-By-State Comparison of Obesity

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I. Introduction

In the past three decades the United States experienced a surge in obesity. Since the 1970s the child obesity rate has tripled.[1] Adult obesity followed a fast-growing obesity trend as well, growing from 12% in 1992 to 21% in 2001.[2] Obesity is generally measured by one's body mass index (BMI), which calculates body fat by looking at height and weight.[3]

In a recent report, the American Heart Association identified two core causes that spurned this obesity epidemic.[4] First, people are eating too much of the wrong food.[5] People today are consuming larger serving sizes and, consequently, increasing their calorie intake.[6] Not only is calorie intake increasing, but Americans today are consuming less nutritional food than in the past.[7] More unhealthy snacks are part of the modern diet, while nutritional staples, such as milk and grains, are being consumed less.[8] Eating out has also increased in contemporary diets and restaurant foods tend to be less healthy to people than homemade meals. The second major cause for the rise in obesity is that people are not engaging in as much physical activity as in the past.[9] Schools are providing less time and instruction for physical education. The rise of entertainment technology that is accessible to Americans spurned a more sedentary lifestyle as well. One study reports that the "typical American child spend[s] about 44.5 hours per week using media outside of school."[10]

The rise in obesity comes at a great cost. These costs include higher medical expenses and an increase in sick days away from work.[11] The financial impact not only affects individuals, but also impacts society, as the increase in medical care costs leads to overall loss of productivity. Obesity not only impacts our pocketbooks, but also it alters

our health and quality of life. Several diseases are now linked with obesity, including diabetes, hypertension, gallstones, arthritis, and heart disease.[12] In addition, obesity can inhibit individual mobility and increases the likelihood of depression.[13]

Obesity has proven to be a negative externality on society. One study estimated that the average state spends $2.27 billion on obesity-related expenses through such programs as Medicare and Medicaid.[14] Citizens are beginning to petition the government to take action to end this obesity trend. States are responding to these petitions in various ways, including school nutritional and physical education programs for children and general nutritional and physical education guidelines and programs for adults.
The purpose of this study is to analyze the causes of obesity on a nationwide level through a state-by-state comparison of individual characteristics of the citizens, state characteristics, and state-based programs.

II. Test Variables

This study will look at the characteristics of individual citizens, state characteristics, and state-based programs aimed to reduce obesity. By studying individual characteristics, we seek to identify whether certain kinds of people are more likely to congregate in certain areas that have particular levels of obesity. If this is the case, then the state itself may have very little impact on obesity and individual characteristics may be the stronger determinants of obesity. By analyzing state characteristics, we also seek to identify whether attributes of states tend to appeal to certain people and whether certain states reduce obesity by virtue of their characteristics rather than through their programs. Finally, an analysis of state-based programs may

reveal trends in obesity that reflects whether the programs are effectively reducing levels of obesity.

Dependent Variable:

Body Mass Index (BMI)

Independent Variables:

Individual Characteristics

Age (≤18, 19-64, ≥65)
Ethnicity (White, Black, Other)
Poverty level (≤100% Federal Poverty Level (FPL), 100-199% FPL, ≥200% FPL)
Median annual income
Household size
Education level (≥High School Diploma)
Participation in physical activity
Alcohol consumption
Adult smoking rate

State Characteristics

Population size
Urban distribution
Unemployment rate
Average state temperature
Restaurants per capita
Region (New England, Mid-Atlantic, Midwest, South, Southwest, West)

State-Based Programs

Statewide Programs

CDC-funded anti-obesity programs (No, Capacity Building, Basic Implementation)

K-12 Programs

Nutritional Standards for School Meals
Nutritional Standards for Competitive Foods
Limited Access to Competitive Foods
BMI or Health Information Collected
Non Invasive Screening for Diabetes

Health Education Requirements
CDC School Health Grants

Total Number of School Focus Programs

III. Hypothesis

Our hypothesis is that all three major categories, namely individual characteristics, state characteristics, and state-based programs, will have a significant impact on levels of obesity. However, we expect that state-based initiatives may have less of an impact because they have only begun within the last decade. Our null hypothesis is that there is no correlation between the average BMI per adults per state and the independent variables previously listed.

IV. Data Sources

We compiled the dataset from several different sources. The majority of the variables were collected from statehealthfacts.org, a Kaiser Family Foundation website. The factors collected from this site included: distribution of age, distribution of ethnicity, distribution by federal poverty level (FPL), median annual income, percent of adults who smoke, metropolitan distribution, and unemployment rate. The U.S. Census Bureau provided information on the average household size, the percent of state citizens with a high school diploma or higher, and population size. The 2007 Trust for America's Health report collected the data on BMI and state-based programs. Through the Center for Disease Control and Prevention (CDC)'s website, www.cdc.gov, we gathered information on CDC state-based programs. Several other variables came from individual sources: annual alcohol consumption came from a Time Magazine review, average state

temperatures came from the National Climatic Data Center (NCDC), and restaurants per capita came from StateMaster.com. Hawaii's average temperature data was not available through NCDC so we gathered average data about one location in Hawaii, Lihue, from the Western Regional Climate Center. In order to provide a consistent time frame in the data, we used data that was gathered between 2004 and 2007. We tended to used more recent data when it was available.

V. Analysis

The analysis consisted of several steps. First, we created box plots for all nominal and ordinal variables that were non-dummy variables in order to visually assess the relation of the categories within those variables. Second, we performed a bivariate correlation analysis for each independent variable with the dependent variable. A description of each significant variable will follow in the analysis. Third, we conducted a series of multiple regressions, taking into account the independent variables that were significant in the bivariate correlation analysis. Each multiple regression iteration involved changing variables according to their p-values in the previous iteration. In addition, we performed correlation analysis on variables that appeared to be correlated. We performed steps two and three for each of the three major categories. Next, we pooled independent variables from all of the main categories in various combinations to create our best model that describes causation of mean BMI scores among the states. Finally, we performed a stepwise regression to analyze the impact of the many different independent variables. Because social studies such as this have such a diversity of causal influences we used a 10% significance level for independent variables.

A. Individual Characteristics

Conducting a bivariate correlation analysis of the BMI, comparing each of the independent variables in the individual characteristics category, revealed that five independent variables had a significant impact on BMI, as shown in Table 1.

Table 1: Significant Individual Characteristics

Variable	P-Value
Children	.850
Adults	.893
Seniors	.879
White	.638
Black	.065*
Other Race/Ethnicity	.448
Poverty	.620
Low Income	.743
Middle/High Income	.989
Median Annual Income	.000*
Average Household Size	.181
Education	.000*
Physical Inactivity	.000*
Alcohol Consumption	.465
Adult Smoking	.000*

*10% Significance Level

A review of the covariate correlation analyses and multiple regressions revealed that a few of the independent variables were potentially correlated. The three pairs of significant independent variables that are highly correlated at a 10% significance level are median income and education (p-value of .000), smoking and physical inactivity (p-value of .000), and Blacks and physical inactivity (p-value of .002). Because research shows that an increase in education generally results in an increase in median income, we intuited that income and education would be highly correlated.[15] It is also not surprising that smoking and physical inactivity are correlated because smoking often inhibits lung capacity and cardiovascular activity. The correlation between Blacks and physical

inactivity is less expected but the p-value reveals that there is a strong correlation between these two independent variables. For each combination of independent variables, we analyzed which of the two independent variables had the highest p-value and omitted that variable from the model.

We performed several multiple regressions in order to identify the best model of individual characteristics that effect change in the mean BMI. The best model included adult smoking rate, physical inactivity, and median annual income, which yielded an adjusted R^2 of .592. Thus, adult smoking rate, physical inactivity, and median annual income explain 59.2% of the variation in mean BMI across the states.

Table 2: Model Summary for Multiple Regression Model for Individual Characteristics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786(a)	.617	.592	.017997

Table 3: Coefficient Table for Multiple Regression Model for Individual Characteristics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.167	.042		3.979	.000
	Adult Smoking Rate (%) 2006	.003	.001	.385	3.003	.004
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.208	.090	.288	2.317	.025
	Median Annual Income (per 1000) 2006	-.001	.000	-.236	-1.953	.057

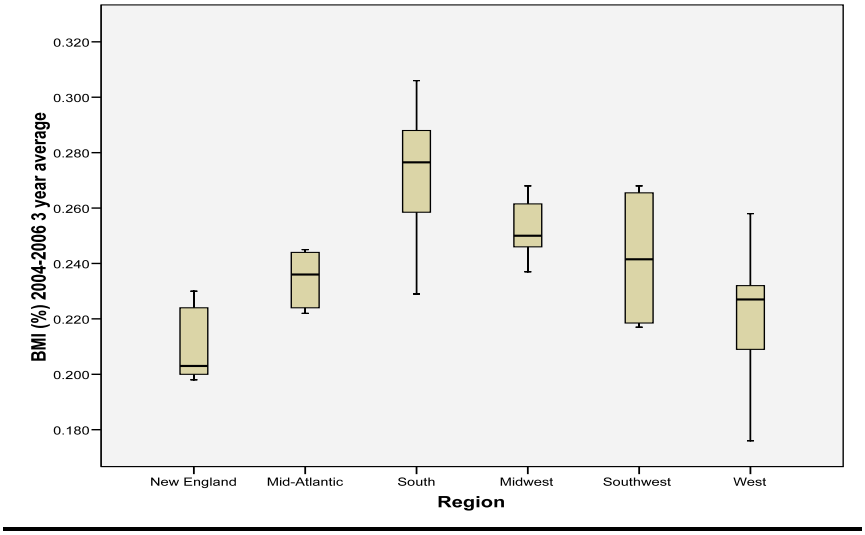
Each of the independent variables followed directional trends that are intuitive. There is a positive relationship between mean BMI and adult smoking and physical inactivity and there is a negative relationship between mean BMI and median annual

income. The most powerful independent variables among the individual characteristics are adult smoking rate, physical inactivity, and median annual income. Thus, one would intuitively expect that as income rises and the adult smoking rate goes down individuals are more likely to increase physical activity and thus decrease mean BMI.

B. State Characteristics

We divided the states into six regions and created a box plot allowed for a regional comparison of BMI rates. As demonstrated in Figure 1, the South region has the highest mean BMI in the U.S. while the West and New England regions have the lowest mean BMI. This descriptive analysis demonstrated that regional differences significantly impact obesity levels for a given state. What factors affect each region will be discussed later in the paper.

Figure 1: Box Plot graph of BMI % for each Region of the U.S.



We performed a bivariate correlation analysis, comparing each of the independent variables in the state characteristics category to the average BMI. There are six independent variables that had a significant impact on mean BMI, as shown in Table 4. They are: urban distribution, unemployment rate, restaurants per capita, and the three

regions; New England, South, and West. These were all significant at a 10% significance level.

Table 4: Significant State Characteristics

Variable	P-Value
Population	.862
Urban Distribution	.000*
Unemployment Rate	.002*
Average State Temperature	.143
Restaurants per Capita	.000*
New England	.002*
Mid-Atlantic	.485
Midwest	.153
South	.000*
Southwest	.962
West	.003*

*10% Significance Level

After performing simple regression and multiple regressions for all of these variables, we found that the South region was highly correlated with both urban distribution and restaurants per capita; therefore, we removed urban distribution and restaurants per capita from our regression because the South produced a lower p-value in the regression than the other two variables. The best model resulted in an adjusted R^2 of .752, as shown is Table 5. Thus, the following five variables explains 75% of the mean BMI in the United States: urban distribution, unemployment rate, restaurants per capita, and the two regions; New England, and West.

Table 5: Model summary for state characteristics:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.882[a]	.777	.752	.014035

a. Predictors: (Constant), West, New England, Unemployment Rate (%) Jan 2007, Urban Distribution (% of Population) 2000, Resturants per capita (per 100 people) 2004

Table 6: Coefficient Table for Multiple Regression Model for State Characteristics

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.316	.023		14.030	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.438	-5.958	.000
	Unemployment Rate (%) Jan 2007	.009	.002	.315	4.245	.000
	Resturants per capita (per 100 people) 2004	-.174	.067	-.217	-2.598	.013
	New England	-.040	.007	-.465	-5.779	.000
	West	-.018	.005	-.274	-3.376	.002

a. Dependent Variable: BMI (%) 2004-2006 3 year average

A closer look at the variables show that, among the state characteristics, only unemployment rate has a positive coorelation with mean BMI. The other characteristics all have a negative correlation; the most interesting of those was restaurants per capita. We hypothesize that this phenomena is correlated with large urban areas that have more restuarants per capita because other factors have a smaller mean BMI.

C. State-Based Programs

For the third set of independent variables, we performed a bivariate correlation analysis to deduce which state-based programs significantly impact mean BMI in the United States. The results showed that only one program, the CDC-funded anti-obesity program, was statistically significant at the 10% significance level (see Table 7). This program was the only program targeting all ages; other programs focused exclusively on K-12 schools. At first glance, the results infer that these K-12 programs are ineffective. However, since obesity has only recently become a major issue to the public, these programs are all relatively new (2002 – present) and may suffer from other problems, such as program management, funding, etc. One can reason that given time these programs may become more important in the fight against obesity.

Table 7: Significant State-Based Programs

Variable	P-Value
CDC-Funded Anti-Obesity Program	.056*
Nutritional Standards for School Meals	0.825
Nutritional Standards for Competitive Foods	0.201
Limited Access to Competitive Foods	0.217
BMI or Health Information Collected	0.234
Non-Invasive Screening for Diabetes	0.718
Health Education Requirements	0.295
Receives CDC School Health Grants	0.661
Total Number of State-Based Programs	0.293

*10% Significance Level

VI. Best Model

The final phase of analysis involved mixing the independent variables in different combinations in order to derive the model that has the highest explanatory power, as reflected by the adjusted R^2. First, all independent variables that were the best models for the three main categories were entered into the first multiple regression model. Next, we removed the independent variables that were not significant at a 10% significance level in the first multiple regression. As we tested different combinations of independent variables in the model using stepwise regression, we discovered two significant correlations between independent variables: CDC-funded anti-obesity programs and the West are correlated with a p-value of .011 and median income and unemployment rate are correlated with a p-value of .091. We selected the independent variable that produced the lowest p-value in the regression model and omitted the other independent variable for each pair. Thus, CDC-funded anti-obesity programs and median income were removed from the model.

The best model without using stepwise regression, after adjusting several independent variables, included six independent variables: physical inactivity,

unemployment rate, urban distribution, restaurants per capita, New England, and the West. These independent variables yielded an adjusted R^2 of .805. Therefore, this model explains 80.5% of the variation in mean BMI across the states (see Table 8).

Table 8: Model Summary for the Non-Stepwise Multiple Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.911(a)	.829	.805	.012436

Table 9: Coefficient Table for the Non-Stepwise Multiple Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.264	.025		10.666	.000
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.212	.059	.292	3.612	.001
	Unemployment Rate (%) Jan 2007	.007	.002	.238	3.438	.001
	Urban Distribution (% of Population) 2000	-.001	.000	-.422	-6.460	.000
	Restaurants per capita (per 100 people) 2004	-.144	.060	-.180	-2.400	.021
	New England	-.033	.006	-.385	-5.156	.000
	West	-.011	.005	-.159	-2.022	.049

As a final step in identifying the best model, we performed a stepwise regression involving nearly all of the independent variables. The best stepwise regression model contained six independent variables: physical inactivity, unemployment rate, urban distribution, restaurants per capita, New England, and nutritional standards for school meals. See Appendix A for the complete stepwise regression model. The only difference in independent variables between the stepwise regression and the non-stepwise model was that nutritional standards for school meals replaced the West. We performed a

correlation analysis on the West and nutritional standards for school meals, but the analysis revealed no significant correlation. The stepwise regression model yielded an adjusted R^2 of .824. This means that the regression model explains 82.4% of the variation in the mean BMI across the states (see Table 10).

Table 10: Model Summary for the Stepwise Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
12	.920(l)	.846	.824	.011820

Table 11: Coefficient Table for the Stepwise Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
12	(Constant)	.254	.024		10.747	.000
	Restaurants per capita (per 100 people) 2004	-.187	.055	-.233	-3.383	.002
	New England	-.024	.006	-.280	-4.154	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.433	-7.067	.000
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.312	.054	.431	5.799	.000
	Unemployment Rate (%) Jan 2007	.006	.002	.229	3.492	.001
	Nutritional Standards for School Meals 2007	-.012	.004	-.197	-3.021	.004

A review of the standardized coefficients reveals that urban distribution has the most significant explanatory power of all of the independent variables. See Table 11 for a synopsis of the stepwise multiple regression model. Based on the results of the stepwise regression model, we reject the null hypothesis at a 10% significance level. In fact, each of the independent variables in the stepwise model is significant, even at a significance level of 1%. Individual characteristics, state characteristics, and state-based programs do have a significant impact on the average BMI in states.

VII. Limitations

While the efforts of such organizations, like the Kaiser Foundation and CDC, to gather data and provide analysis is commendable there are still significant gaps in the data. Information about diet (i.e. calorie consumption) and media consumption (i.e. number of hours watching television), two primary causes of obesity in individuals, is noticeably absent from the data. There is little doubt that these two variables significantly impact obesity in states. As this data becomes available, a more complete picture of obesity on the nationwide level will become apparent. Calorie and media consumption are certainly the most important missing variables in this model but other variables are missing as well, such as parks per capita because and parks encourage activity and improve public health.[16] By measuring other state variables, like humidity and parks space, a more extensive analysis of state characteristics may explain differences between states more thoroughly.

In addition, the impact of state-based anti-obesity programs is difficult to determine at this time. The majority of programs that seek to decrease obesity began in 2002, less than a decade ago. Given more time, the significance of state-based programs may become more pronounced.

VIII. Policy Implications

The results of this study contribute to the obesity literature by explaining several different forces that impact obesity in a state. State intervention to address obesity is a relatively new phenomenon. Since 2002, the CDC has granted funds to states for anti-

obesity programs; as a result, a plethora of state programs have emerged. These programs seek to educate the public on obesity and often strongly encourage regular exercise and monitoring one's diet. However, the results of this study show that states need to look at other variables beyond the physical health of their citizens because state characteristics also significantly impact the mean BMI of the population.

Hence, states should consider what characteristics significantly impact the average BMI in the state and how to manage those characteristics. Even so, some characteristics are easier to change than others. While states can impact the number of restaurants per capita and urban distribution through regulation and other means, they are unable to change their regional location in the country. Regardless, the strong, positive impact of physical activity and nutritional school programs validate the states' efforts to educate the public about diet and exercise.

States are endowed with various powers to motivate certain behaviors in their borders. These powers include grant distribution, taxation, subsidization, regulation, and coercion. Determining which one of these state powers will provide the greatest net benefit must be determined at the state level. Some states may find that subsidizing exercise programs or teams on the municipal level may be more beneficial than regulating physical education in schools. Other states may learn that providing grants to schools will lead to positive trends in the fight against obesity.

One caveat to this research is that it does not reveal at what point a change in an independent variable (i.e. urban distribution) will no longer have a negative impact on BMI or at what point it is no longer significant. Public policy operates in a world of scarcity and resource allocation decisions are politically-charged and difficult to make.

This study seeks to elevate awareness for policy makers that obesity can be reduced but each state must decide if reducing obesity produces a net social and economical benefit.

IX. Conclusion

In the coming years more research will need to be done to determine what factors lead to obesity and how to combat those factors. This study contributes to the obesity literature by analyzing obesity on a state level. In this study, we analyzed three broad categories of independent variables that may impact the average mean obesity for a state: individual characteristics, state characteristics, and state-based programs. The data analysis confirmed our hypothesis, that all three categories of independent variables significantly impact the average mean obesity per state. This study found that among the independent variables, state characteristics were the most statistically significant variables in determining obesity levels across the United States. We found that state-based programs have the least significant impact on obesity in states; however, given their recent inception, state-based programs may have a more critical impact on reducing obesity in the future. As states increasingly establish legislation to combat obesity, they should each take a closer look at characteristics that make up their state. By better understanding the makeup of one's state, legislators will better be able to determine what works best for their constituents.

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Appendix A: Stepwise Regression Model

Stepwise Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712(a)	.507	.496	.019998
2	.792(b)	.627	.611	.017575
3	.821(c)	.674	.653	.016606
4	.841(d)	.707	.681	.015927
5	.857(e)	.735	.705	.015309
6	.874(f)	.764	.731	.014620
7	.871(g)	.759	.732	.014590
8	.901(h)	.811	.785	.013073
9	.914(i)	.836	.809	.012326
10	.912(j)	.832	.809	.012313
11	.924(k)	.853	.828	.011671
12	.920(l)	.846	.824	.011820

Stepwise Regression Coefficient Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.113	.019		6.011	.000
	Adult Smoking Rate (%) 2006	.006	.001	.712	7.021	.000
2	(Constant)	.201	.028		7.171	.000
	Adult Smoking Rate (%) 2006	.006	.001	.616	6.667	.000
	Resturants per capita (per 100 people) 2004	-.288	.074	-.360	-3.892	.000
3	(Constant)	.276	.039		7.005	.000
	Adult Smoking Rate (%) 2006	.004	.001	.455	4.240	.000
	Resturants per capita (per 100 people) 2004	-.267	.070	-.333	-3.786	.000
	Median Annual Income (per 1000) 2006	-.001	.000	-.276	-2.578	.013
4	(Constant)	.245	.040		6.071	.000
	Adult Smoking Rate (%) 2006	.004	.001	.475	4.593	.000
	Resturants per capita (per 100 people) 2004	-.258	.068	-.322	-3.815	.000
	Median Annual Income (per 1000) 2006	-.001	.000	-.271	-2.641	.011
	Health Education Requirements 2007	.026	.012	.182	2.238	.030
5	(Constant)	.223	.040		5.559	.000
	Adult Smoking Rate (%) 2006	.004	.001	.483	4.859	.000
	Resturants per capita (per 100 people) 2004	-.215	.068	-.268	-3.151	.003

	Median Annual Income (per 1000) 2006	-.001	.000	-.219	-2.159	.036
	Health Education Requirements 2007	.028	.011	.197	2.516	.016
	New England	-.016	.007	-.187	-2.170	.035
6	(Constant)	.251	.040		6.245	.000
	Adult Smoking Rate (%) 2006	.004	.001	.419	4.237	.000
	Resturants per capita (per 100 people) 2004	-.236	.066	-.295	-3.598	.001
	Median Annual Income (per 1000) 2006	.000	.000	-.100	-.905	.370
	Health Education Requirements 2007	.026	.011	.183	2.436	.019
	New England	-.021	.007	-.250	-2.883	.006
	Urban Distribution (% of Population) 2000	.000	.000	-.231	-2.290	.027
7	(Constant)	.235	.036		6.562	.000
	Adult Smoking Rate (%) 2006	.004	.001	.451	4.874	.000
	Resturants per capita (per 100 people) 2004	-.243	.065	-.303	-3.718	.001
	Health Education Requirements 2007	.026	.011	.183	2.439	.019
	New England	-.024	.007	-.277	-3.417	.001
	Urban Distribution (% of Population) 2000	-.001	.000	-.274	-3.095	.003
8	(Constant)	.218	.032		6.728	.000
	Adult Smoking Rate (%) 2006	.002	.001	.233	2.232	.031
	Resturants per capita (per 100 people) 2004	-.189	.060	-.236	-3.129	.003
	Health Education Requirements 2007	.024	.010	.168	2.504	.016
	New England	-.024	.006	-.278	-3.820	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.338	-4.149	.000
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.230	.067	.318	3.435	.001
9	(Constant)	.224	.031		7.302	.000
	Adult Smoking Rate (%) 2006	.001	.001	.105	.953	.346
	Resturants per capita (per 100 people) 2004	-.170	.058	-.212	-2.945	.005
	Health Education Requirements 2007	.021	.009	.151	2.367	.023
	New England	-.028	.006	-.322	-4.550	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.394	-4.928	.000
	No Participation in Physical Activity in the	.231	.063	.319	3.650	.001

	last month (% of adults) 2004-2006 3 year average					
	Unemployment Rate (%) Jan 2007	.005	.002	.194	2.524	.015
10	(Constant)	.239	.026		9.064	.000
	Resturants per capita (per 100 people) 2004	-.168	.057	-.209	-2.915	.006
	Health Education Requirements 2007	.020	.009	.141	2.244	.030
	New England	-.029	.006	-.339	-4.955	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.441	-6.920	.000
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.263	.053	.364	4.963	.000
	Unemployment Rate (%) Jan 2007	.006	.002	.228	3.331	.002
11	(Constant)	.240	.025		9.622	.000
	Resturants per capita (per 100 people) 2004	-.180	.055	-.224	-3.282	.002
	Health Education Requirements 2007	.013	.009	.091	1.449	.155
	New England	-.025	.006	-.295	-4.385	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.431	-7.133	.000
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.306	.053	.423	5.740	.000
	Unemployment Rate (%) Jan 2007	.006	.002	.226	3.488	.001
	Nutritional Standards for School Meals 2007	-.010	.004	-.165	-2.420	.020
12	(Constant)	.254	.024		10.747	.000
	Resturants per capita (per 100 people) 2004	-.187	.055	-.233	-3.383	.002
	New England	-.024	.006	-.280	-4.154	.000
	Urban Distribution (% of Population) 2000	-.001	.000	-.433	-7.067	.000
	No Participation in Physical Activity in the last month (% of adults) 2004-2006 3 year average	.312	.054	.431	5.799	.000
	Unemployment Rate (%) Jan 2007	.006	.002	.229	3.492	.001
	Nutritional Standards for School Meals 2007	-.012	.004	-.197	-3.021	.004

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[2] Salinsky, Eileen & Wakina Scott (2003). *Obesity in America: A Growing Threat*, National Health Policy Forum Background Paper (Washington, DC: George Washington University), 2-3.
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[4] The American Heart Association (2005). *A Nation at Risk: Obesity in the United States A Statistical Sourcebook* (Dallas: The American Heart Association), 18-27.
[5] Ibid., 18.
[6] Ibid.
[7] Ibid., 19-24.
[8] Ibid., 19-26.
[9] Ibid., 27.
[10] Ibid.
[11] Ibid., 16.
[12] Ibid., 14.
[13] Salinsky et al., 8.
[14] See CDC website (accessed April 4, 2008).
[15] See Baum, Sandy, & Jennifer Ma (2007), *Education Pays 2007: The Benefits of Higher Education for Individuals and Society* (Washington, DC: The College Board), 9-14.

[16] See Bedimo-Rung, Ariane L., Andrew J. Mowen , & Deborah A. Cohen (2005), The Significance of Parks to Physical Activity and Public Health: A Conceptual Model, *American Journal of Preventive Medicine*, 28, 159 – 168.