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An Exploratory Analysis of Fruit and Vegetable Consumption in Black Men

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AN EXPLORATORY ANALYSIS OF FRUIT AND VEGETABLE CONSUMPTION IN BLACK MEN

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ABSTRACT

Reiter, Jacqueline M. M.P.H., Purdue University, May 2014. An Exploratory Analysis of Fruit and Vegetable Consumption in Black Men. Major Professor: Dr. Haslyn Hunte.

Objective: Multiple peer-reviewed studies have found an association between fruit and vegetable consumption and lower risk for diseases such as hypertension, stroke and cancer. In other related studies, education level, retail food environment, and fruit and vegetable consumption were also examined together to discover patterns and associations. Currently, Black males have a higher risk for poor health outcomes. Limited research has focused specifically on Black men's fruit and vegetable consumption. This study explored the association between education level, food store access (measured by proximity) and fruit and vegetable consumption in black African American men.

Design: The data for this study was obtained using three sources; (1) the 2011 Black Men's Health Study from 12 Indiana counties, (2) 2006-2011 Food Atlas Documentation, and (3) the 2007-2011 United States Census data. This study utilized multilevel regression modeling to estimate the association between fruit and vegetable consumption, education level and food access.

Setting: 12 Indiana counties

Results: Among the variables of interest, this study demonstrated greater fruit consumption among Black males with the highest level of education. The proximity to grocery stores was not associated with consumption, although healthcare coverage and number of children in household were all statistically

($p < 0.05$) associated with fruit and vegetable consumption.

Conclusion: The findings suggest a need for more research in this area. Specifically, research will need to address food availability, food store type and distance to food store.

CHAPTER 1. INTRODUCTION

1.1 Introduction

Fruit and vegetable consumption has been associated with a reduced risk from heart disease, cancers and stroke, some of the main causes of mortality in the United States.[1] Evidence indicates a reduced risk for cardiovascular disease following a diet of two and a half cups of fruits and vegetables per day.[2] Additionally, other evidence indicates a protective effect of fruit and vegetable consumption in the development of cataracts, hypertension, chronic obstructive pulmonary disease (COPD) and diverticulosis.[1] Fruits and vegetables are also high in nutrients like folate, potassium, magnesium, dietary fiber and vitamins A, C and K. According to the United States Department of Agriculture, folate, potassium and dietary fiber are currently under consumed. These nutrients are important in managing and preventing chronic conditions. For example, potassium can blunt the adverse effects of sodium and help to lower blood pressure. Based on an extensive scientific review, the 2010 U.S. Dietary Guidelines recommends five servings of fruits and vegetables per day, with differences based on caloric intake.[2]

Even with the overwhelming evidence for the health benefits of fruits and vegetables, the average consumption in Americans remains low. On average, only 32.5% of Americans eat the recommended two servings of fruit per day and 26.3% eat the recommended three servings of vegetables per day.[3] These overall means, however, mask consumption differences by gender and race.[4] When comparing consumption by gender, significantly less men consumed five servings of fruits and vegetables per day compared to women. Furthermore,

when comparing race specifically among men, 35.9% of Asian/Pacific Islander men and 24.2% of American Indiana/Alaska Native men reported consuming five servings of fruits and vegetables per day. Hispanic and African American men have the lowest consumption of fruits and vegetables, with about 21% consuming the recommended five daily servings of fruits and vegetables.[4] In recognition of the suboptimal consumption rates among many subpopulations, the Healthy People 2020 initative has set an objective for an increase in the consumption of fruits and vegetables along with an increase in the variety of vegetables consumed.[5]

Of particular concern, however, is the observed racial/ethnic disparities in fruit and vegetable consumption and the potential association with the observed in health outcomes. Disparities in health outcomes most associated with fruit and vegetable consumption among Black or African American populations compared with whites and other minority populations remain high. The most recent data, 2008-2010, shows African Americans suffer the highest age-adjusted death rate among all other races with 919.2 deaths per 100,000 compared with whites at 750.5.[6] Blacks also have the highest age-adjusted death rate for heart disease compared with all other races.[7] Black males have the lowest life expectancy when measured at birth, 65 years and 75 years of age.[8] These outcomes can be linked to overall health behaviors such as fruit and vegetable consumption.[1] Black men's health outcomes are at a high risk according to this data, thus it is important to focus research on this population.

Previous literature has found an association between individual and population-level characteristics and fruit and vegetable consumption.[9] For example Dubowitz et. al. examined the association between fruit/vegetable consumption and race along with the extent to which neighborhood socio-economic status (SES) affected consumption. In a sample of 3,819 Non-Hispanic blacks and 5,036 Non-Hispanic whites, blacks consumed significantly lower daily servings of fruits and vegetables, an average of 3.99 per day, compared with whites, reporting an average of 4.90.[9] After adjusting for individual characteristics,

blacks consumed 0.42 fewer servings than did whites. When neighborhood SES variables were included in the model, the disparity between whites and blacks were reduced even further, which provides evidence for the impact of social environment on dietary intake.[9]

Education is another individual level characteristic, along with race and socio-economic status that research has found to be postively associated with fruit and vegetable consumption.[10-12] In a recent study, Jack et al found college graduates were 3.83 times more likely to consume the recommended servings of fruits and vegetables compared to those with less than a high school degree.[11] In another study of Black women, more years of education were significantly associated with shopping at a supermarket and higher fruit and vegetable consumption.[10] Furthermore, a significant difference between education and fruit and vegetable consumption among Koreans was found in a study by Hong.[12] In this 10-year study between 1998 and 2009, adults with a middle school degree or less consumed lower servings of fruits and vegetables compared to those with a high school or college degree. A report by the CDC in 2009 also shows higher fruit and vegetable consumption rates among college graduates compared with all others.[13] The literature surrounding individual-level characteristics and fruit and vegetable consumption indicates non-whites and less educated are more likely to comsume lower rates of fruits and vegetables.

In addition to neighborhood SES and education levels, the availability of food, often referred to as food insecurity has been a factor of interest in the consumption of fruits and vegetables. Specifically, food insecurity is defined as the disruption of eating patterns due to the lack of financial and other resources at sometime during the year.[14] A recent study suggested greater food insecurity has been associated with lower fruit and vegetable consumption, specifically in rural areas.[14] Additionally, food insecurity has been related to a lack of access to a variety of foods based on the retail food environment in the surrounding area.[15] Multiple studies have noted an association between the type of food store and fruit and vegetable consumption.[15-18] For example, a study of 919 residents in the

Detroit area found a 0.69 increase in average fruit and vegetable servings der day with the presence of a large grocery store within 0.5 miles of the respondent's home.[15] The Atherosclerosis Risk in Communities (ARIC) study found a dose response relationship between the number of supermarkets within the census tract and meeting recommended fruit and vegetable servings.[18] For every additional supermarket within the census tract, black Americans reported a 32% increase in consumption. The built environment, which is defined as human made resources and infrastructure designed to support human activity, can play an integral role in the availability of high quality food sources.[19] The retail food environment is part of the larger built environment and studies have shown limited access to healthy foods can be a barrier to healthy eating.[20]

To date, numerous studies have found lower fruit and vegetable consumption rates in areas with less supermarkets and greater distance to food stores. However, the authors are unware of any study that has focused primarily on food store proximity. Research is needed to address whether there is an association between educational attainment, food store access and fruit and vegetable consumption. As research has shown, there is a significant difference in consumption among gender and race, but limited research concerning black/African Americans. With a higher age-adjusted death rate and lower life expectancy among black African American males, it is important to focus on this population, which is at high risk for developing a disproportional number of adverse health outcomes.[6]

This study examines if, and to what extent, food store access and individual characteristics are associated to fruit and vegetable consumption in Black men. More specifically, we examined whether proximity of food stores (living more than one mile from a food store in an urban area or more than ten miles in a rural area) and educational attainment has a significant relationship to consuming more than two servings of fruit and three servings of vegetables per day. For this study, food stores are defined by the Food Environment Atlas Documentation as any supermarket or large gorcery store.[21] Based on the results

from previous literature, we hypothesized that: (1) higher educational attainment is positively associated with fruit and vegetable consumption (2) greater distance to travel to a food store is inversely associated with fruit and vegetable consumption.

CHAPTER 2. EXPERIMENTAL METHODS

2.1 Study Design

This study used a cross-sectional analysis based on three data sources. In 2011, the Indiana Minority Health Coalition and Purdue University's Department of Health and Kinesiology surveyed 1,444 African American/Black males, age 18 and older, across 12 Indiana counties for the Black Men's Health Study. Interviewers, trained members of the community, used convenience sampling to recruit a large sample of Black men from community organizations. Two surveys were administered, Survey A and Survey B. Only Survey A was utilized for our purposes, which measured physical and mental health, psychosocial support and socioeconomic status. Participants provided informed consent and appropriate institutional review boards at Indiana University and Purdue University approved the study. Participants received a $15 gift card upon completion of the survey. Data from the 2006-2011 Food Environment Atlas Documentation was used to supplement county-level data regarding the availability of food resources. The Atlas Data provides data concerning food environment including 160 indicators ranging from food choices to health and well-being and community characteristics for the United States. The final data source, extracted from the United States Census Bureau, contains county-level population characteristics from 2007-2011.

2.2 Measures

2.2.1 Outcome Variable

Fruit and Vegetable Consumption. The outcome of interest was the number of servings of fruits and vegetables respondents eat in an average day.

Respondents answered in a multiple-choice format with the following choices: (a) none (b) 1 (c) 2 (d) 3 (e) 4 (f) 5 or more (g) don't know/not sure. The don't know/not sure responses were recoded as missing. Respondents indicating 4 and 5 or more servings were grouped together in the analysis, since they met the recommended servings for fruits and vegetables. Daily fruit and vegetable consumption were treated as continuous variables.

2.2.2 Independent Variables

Proximity of Store. Food Access Research Atlas defines low access to healthy foods as being "far" from a food store. Based on the definition of a food desert provided by the United States Department of Agriculture and the Food Atlas Documentation, 1-mile and 10-mile demarcations were utilized to measure the distance between the population and food stores. One-mile corresponds to those living in an urban area and 10 miles corresponds to those living in a rural area. Both measurements correspond to approximately 20 minutes of time taken to travel to food store (i.e. 20 minutes to walk 1-mile or 20 minutes to drive 10 miles). A cumulative distribution function was utilized to show that 1-mile corresponds to the 60th percentile of distance to nearest supermarket. Any individual living greater than 1 mile or 10 miles is greater than the median distance [22]. Low food access or food store proximity was measured in terms of the percentage of people in a county living more than 1 mile from a supermarket in an urban area and more than 10 miles in rural areas. **Level of Education:** Participants were asked to indicate their level of education by the following multiple-choice options: (a) less than high school (b) high school or equivalent (c) some college or trade school (d) college graduate or more education. Based on the previous data indicating a relationship between consumption and education, the coding was designated as 1, less than high school education 2, high school education and 3, more than high school education.[10-12] **Individual Level Variables:** Age was measured in years. Annual household income was recoded as less than $10,000, between $10,000-$19,999, between $20,000-$34,999 and

above $35,000. Marital status was recoded as (1) married or (0) all others, which includes divorced, widowed, separated, never married and member of an unmarried couple. Employment status was recoded as (1) employed or self-employed and (0) out of work, student, retired or unable to work. The number of adults in the household and the number of children in the household was measured. Finally, health care insurance was recoded as (1) yes coverage or (0) no coverage. **County Level Variables:** Variables were chosen based on previous data indicating an impact on consumption levels.[9, 10, 14] Women tend to have the role of shopping, preparing and cooking the household food; therefore, a positive association between living status and dietary intake in men has been found.[23, 24] Variables were obtained from the 2007-2011 United States Census and included: 1) 2011 percent female population; 2) percent over age 25 with high school degree; 3) 2007-2011 percent owner occupied housing; 4) 2007-2011 median home value; 5) 2007-2011 median household income.

2.2.3 Data Analysis

Multilevel regression analysis was used to assess the association of consumption with food store access and educational attainment. We employed multilevel modeling to account for clustering within counties and avoid underestimating standard error. Multiple imputations, a sophisticated technique used to account for missing value uncertainty, were utilized for all individual, county level and access variables.[25] Missing values were imputed using an iterative method that imputes multiple variables by using chained equations, a sequence of univariate imputation methods with fully conditional specification of prediction equations. Continuous variables (age and all county-level variables) were estimated using mean and standard error. The remaining variables were estimated using percentages (Table 1). For each dependent variable, we utilized: 1) a model containing fully unconditional estimates; 2) a model containing only individual-level variables, to investigate associations between consumption and educational attainment; and 3) a model containing individual and county-level

variables, to assess the association between consumption and food store access and the extent to which individual level variables changed after the inclusion of county level variables. Partition coefficients, a common measure used to determine variance attributed to variation across counties, were utilized for each model. All individual-level variables were either grand-mean or grand-mean centered in the multivariable multilevel regression analyses. Analysis was conducted utilizing STATA, version 12.1 (Stata Corp, 2011).

CHAPTER 3. RESULTS

3.1 Results

Summary weighted statistics for both individual and county-level variables are presented in Table 1. Over 52% of participants consumed the recommended two servings of fruits per day and over 26% consumed the recommended three servings of vegetables per day. Respondents were on average 41 years of age and 57% had more than 12 years of education. The majority reported no health coverage, while approximately half of the sample had no children living in the household. Mean percentages of the variables of interest among the 12 counties were calculated from the 2007-2011 United States Census data. The mean percentage with low access (more than 1 mile from food store in urban area and more than 10 miles in rural area) to a food store was 27%. Approximately 75% of individuals living in the 12 counties that were over 25 years of age had a high school degree. The average median home value and median household income of the 12 counties was $124,420 and $48,602 respectively.

Table 2 contains models 1, 2 and 3, predicting fruit consumption. Our results suggest education, number of children in household and healthcare coverage is positively associated with fruit consumption, while age is negatively associated with fruit consumption. To test hypothesis 1, individual-level variables were added to model 2. Participants with more than 12 years of education consumed 0.24 more servings of fruit per day ($p<0.10$). As the number of children in the household increased, fruit consumption increased by 0.06 servings ($p<0.05$). Those participants with healthcare coverage consumed 0.14 more servings per day compared with those that had no healthcare coverage ($p<0.10$). As age increased, fruit consumption decreased by 0.01 servings

($p<0.10$). To test hypothesis 2, county-level variables were added to model 3. The proportion of persons over 25 years of age with a high school degree, percentage of persons owning home and median home value were negatively associated with fruit consumption. Most surprising was that as the proportion of persons with a high school degree and the percentage of females in the population rose, daily fruit servings dropped by 0.11 and 0.07 servings respectively ($p<0.05$). The proximity to a food store (food store access variable) was not a statistically significant predictor of fruit consumption.

Table 3 contains models 1, 2 and 3, predicting vegetable consumption. Education and age were not significant predictors of vegetable consumption as it was for fruit consumption. Like fruit consumption, the number of children in a household and healthcare coverage was positively associated with vegetable consumption. As the number of children living in the household increased, vegetable consumption increased by 0.09 servings ($p<0.05$). Participants with healthcare coverage consumed 0.19 more servings than individuals without health insurance ($p<0.05$). After adjusting for county-level variables in model 3, as the proportion of persons over 25 years of age with a high school degree increased, the consumption of vegetables decreased by 0.03 servings ($p<0.10$). The number of children in the household and healthcare coverage remained significant predictor of vegetables ($p<0.05$). As was the case with fruit consumption, the proximity to a food store variable was not a significant predictor of vegetable consumption.

CHAPTER 4. CONCLUSION

4.1 Conclusion

The main objective of this paper was to explore the relationship between food store proximity, educational attainment and fruit and vegetable consumption. More specifically, we examined whether the percentage of respondents with low access to a food store for each of the 12 counties and the mean level of educational attainment in each county were associated with daily servings of fruits and vegetables. We also examined the association between other variables and fruit and vegetable consumption. The results also suggested the number of children in the household, healthcare coverage, proportion of persons over 25 years of age with high school degree and percent female population were statistically associated with fruit and vegetable consumption.

Fruit consumption was marginally associated with educational attainment while vegetable consumption was not. When measuring fruit consumption and educational attainment, only the highest level of education (more than 12 years) was marginally significant. One possible explanation for this association is that individuals with more than a high school degree could be exposed to more information about the health benefits of fruits which may in turn result in higher levels of consumption, as suggested by prior research.[12] Unfortunately, this does not explain why only fruit consumption was associated with educational attainment and not vegetable consumption. One potential explanation for this difference in consumption pattern may be related to the shelf life of food.[9] In general, common vegetables such as carrots, spinach and cucumbers have a shelf life of approximately 1-2 weeks while apples, pears and citrus fruits have a

shelf life between 1 and 8 months.[26] Food stores may dictate what consumers eat by stocking foods with longer shelf life. It is unclear whether the food store follows consumer behaviors or if the store dictates consumer behaviors. Further research investigating the relationship between shelf space and dietary habits is needed.

The food store proximity variable, percentage of people in the county living more than 1 or 10 miles from food store, was not a statistically significant ($p < 0.05$) predictor of either fruit or vegetable consumption in this study. There could be a few explanations for this finding. First, food store proximity was measured in 1-mile and 10-mile demarcations. These demarcations may not be an appropriate measurement for these select Indiana counties. For example, a study in Los Angeles measured food store access using a walking distance of 0.08 kilometers while another study measured distances using a demarcation of 5 miles and another using demarcations of 100 and 1000 meters.[16, 17, 27] Distance demarcations vary depending on geographic location. If the household does not own a car, the distance to the grocery store may have a larger impact on the number of trips to the food store and the amount of food purchased compared to an individual with a car. A previous study measuring food store access and fruit and vegetable consumption in a national sample of U.S. Food Stamp recipients, found a significant difference in vegetable consumption for respondents with a car.[17] Our proximity variable did not account for mode of transportation available to the men in the study nor was there a variable indicating if the men had readily access to a vehicle or other forms of transportation to go food shopping. Second, only one variable was used to measure food store proximity. Food choices can also be affected by the type of food store, along with the distance to the store. Fresh produce is more available at supermarkets and grocery stores compared with convenience stores.[16, 28] Additionally, the Food Atlas Environment Documentation defined food stores as supermarkets or large grocery stores, thus eliminating small food stores and convenience stores. This could have impacted our data if small food stores were within accessible proximity. Lastly, the variable

does not measure the store from which the respondent primarily purchases food. Food store choices may differ based on the needs of the respondent. Future research that included varying measures of food store proximity and type of food store would be more equipped to explore the relationship to fruit and vegetable consumption.

Although the primary variables of interest were not significantly associated to fruit and vegetable consumption, other individual and county level variables were statistically associated with fruit and vegetable consumption. Interestingly, the number of children in the household and healthcare coverage were both found to be positively associated with fruit consumption. This may in part be due to the fact that children may be exposed to nutrition education and interventions outside of the home, primarily in the school setting.[29] Classroom curriculum involving nutrition has been associated with an increase in fruit and vegetable consumption among children. Additionally, the main cook may also want to model healthy eating behaviors when children are present in the home. Healthcare coverage may increase the likelihood a patient is discussing diet with a healthcare professional and receiving education about fruits and vegetables. When controlling for both individual and county level variables, the proportion of those individuals over 25 with a high school degree and percentage of female population in the county were negatively associated with fruit and vegetable consumption. This does not support previous literature and further research is required to investigate if confounding variables are affecting this outcome.

This study explored the association between food store proximity, educational attainment and fruit and vegetable consumption. Prior studies have suggested food store access variables have been associated with the level of fruit and vegetable consumption, but none have measured these variables in Black men.[9, 14, 15, 18, 19] There are several limitations to this study. First, the individual and county level data was not collected during the same year. The individual-level data was collected via a survey in 2011 while the Census and Atlas data ranges between 2007-2011. Within the 4 year time period, food store

proximity data may not accurately reflect survey data because of the opening and closing of food retail stores.

Second, this is a cross-sectional study. We cannot conclude a causal relationship between healthcare coverage, number of children in household and educational attainment in fruit and vegetable consumption.

Third, the sample of respondents may not accurately reflect the general population from which the men were sampled. Interestingly, the data from Black Men's Health Study shows higher servings of fruit consumption compared to the overall U.S. average population data. Unfortunately, the fruit and vegetable consumption rate of Black males in the U.S. Population is unknown.

In conclusion, it is essential to understand the impact of individual and county-level variables on fruit and vegetable consumption. Additional research is needed in this area and for this specific population. Specifically, research will need to address food store access using food store proximity and food store type. Additionally, multiple demarcations will need to be utilized to understand the effect size for each distance. Our findings that healthcare coverage is related to both fruit and vegetable consumption suggests a need for future research to better understand how such findings may inform future policies that aim to improve fruit and vegetable consumption.

Table 1: Summary weighted statistics for individual and county level variables in 1444 Black men

	% or mean	Standard Error
Individual Level Variables[a]		
Daily fruit servings, %		
0	16.73	--
1	31.83	--
2	28.37	--
3	15.39	--
4	7.78	--
Daily vegetable servings, %		
0	8.30	--
1	31.91	--
2	34.13	--
3	16.59	--
4	9.07	--
Level of Education, %		
<12 years	7.08	--
12 years	35.44	--
> 12 years	57.48	--
Age, in years, mean	41.83	0.41
Marital Status, %		
Married	33.42	--
All others	66.58	--
Employment Status, %		
Employed	57.52	--
All others	42.48	--
Annual Household Income, %		
<$10,000	22.02	--
$10-19,999	22.55	--
$20-34,999	22.21	--
>$35,000	33.21	--
Number of adults in household, %		
1	30.08	--
2	46.20	--
3	15.80	--
4	7.91	--
Number of children in household, %		
0	53.16	--
1	17.22	--
2	14.24	--
3	8.10	--
4	7.29	--
Healthcare Coverage[b], %		
Yes	38.35	--
No	61.65	--
County-level variables [c]		
% low access to food store[d], mean	26.98	0.14
% female population, mean	51.05	0.02
Proportion of person over 25 w/ high school degree, mean	86.88	0.09
% Owner occupied housing, mean	68.76	0.18
Median home value, mean	124420.20	729.96
Median household income, mean	48692.02	282.04

[a] Data collected from Black Men's Health Study, 2011
[b] Includes health insurance, prepaid plans and government plans

[c] With exception of food store variable, all data collected from 2007-2011 United States Census. Food store variable from 2006-2011 Food Environment Atlas Documentation
[d] Living > 1 mile from food store in urban area, or > 10 miles in rural area

Table 2 Results from multilevel linear regression predicting daily fruit consumption among 1444 Black men in 12 Indiana Counties

	Model 1: Fully unconditional			Model 2: Individual Variables			Model 3: County Level Variables		
	Estimate	**SE**	**p-value**	**Estimate**	**SE**	**p-value**	**Estimate**	**SE**	**p-value**
Intercept	1.14	0.023	--	1.132	0.023	0.016	1.132	0.023	0.000
Education (Ref: Less than 12 years)									
12 years				0.213	0.140	0.130	0.223	0.140	0.115
More than 12 years				0.240	0.140	0.090	0.263	0.140	0.063
Age, in years				-0.005	0.003	0.053	-0.004	0.003	0.120
Married (Ref: All other[a])				0.099	0.080	0.217	-0.112	0.080	0.161
Employed (Ref: All others[b])				-0.023	0.075	0.756	-0.019	0.074	0.799
Annual Household Income (Ref: Less than $10,000)									
$10-19,999				-0.145	0.112	0.194	-0.162	0.111	0.154
$20-34,999				-0.000	0.114	0.999	-0.012	0.113	0.915
Greater than $35,000				-0.064	0.107	0.550	-0.066	0.107	0.541
Number of adults in household				-0.057	0.040	0.149	-0.054	0.040	0.179
Number of children in household				0.061	0.028	0.027	0.058	0.027	0.034
Healthcare Coverage (Ref: no coverage)				0.144	0.074	0.053	0.151	0.074	0.041
County Level Variable									
% low access to food store							0.014	0.009	0.133
% female population							-0.111	0.041	0.007
Proportion of person over 25 w/ high school degree							-0.068	0.019	0.001
% Owner occupied housing							-0.016	0.009	0.070
Median home value							0.000	0.000	0.977
Median household income							0.000	0.000	0.154
Variance Coefficient, %	12.196			11.865			0.000		

[a]: All others includes divorced, widowed, separated, never married and member of an unmarried couple
[b]: All others includes out of work, student, retired and unable to work

Table 3: Results from multilevel linear regression predicting daily vegetable consumption among 1444 Black men in 12 Indiana counties

	Model 1: Fully unconditional			Model 2: Individual Level Variables			Model 3: County Level Variables		
	Estimate	**SE**	**p-value**	**Estimate**	**SE**	**p-value**	**Estimate**	**SE**	**p-value**
Intercept	1.07	0.021	--	1.054	0.020	0.000	1.055	0.020	0.000
Education (Ref: Less than 12 years)									
12 years				-0.000	0.130	0.999	-0.001	0.130	0.992
More than 12 years				0.081	0.129	0.532	0.087	0.129	0.501
Age, in years				0.004	0.002	0.131	0.004	0.002	0.138
Married (Ref: All other[a])				0.014	0.077	0.858	0.022	0.077	0.700
Employed (Ref: All others[b])				0.009	0.075	0.905	0.020	0.075	0.794
Annual Household Income (Ref: Less than $10,000)									
$10-19,999				-0.119	0.098	0.225	-0.118	0.098	0.235
$20-34,999				0.075	0.112	0.508	0.071	0.112	0.534
Greater than $35,000				-0.049	0.118	0.680	-0.060	0.118	0.616
Number of adults in household				-0.033	0.038	0.390	-0.032	0.038	0.401
Number of children in household				0.085	0.025	0.001	0.083	0.025	0.001
Healthcare Coverage (Ref: no coverage)				0.188	0.064	0.003	0.195	0.064	0.003
County Level Variables									
% low access to food store							-0.006	0.008	0.444
% female population							-0.021	0.040	0.601
Proportion of person over 25 w/ high school degree							-0.030	0.017	0.076
% Owner occupied housing							-0.005	0.008	0.520
Median home value							0.000	0.000	0.394
Median income							0.000	0.000	0.773
Variance Coefficient, %	9.938			11.357			0.000		

[a:] All others includes divorced, widowed, separated, never married and member of an unmarried couple
[b:] All others includes out of work, student, retired and unable to work

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