Race and health profiles in the United States: an examination of the social gradient through the 2009 CHIS adult survey

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Abstract

Objective: To examine the role of the social gradient on multiple health outcomes and behaviors. It was predicted that higher levels of SES, measured by educational attainment and family income, would be associated with positive health behaviors (i.e., smoking, drinking, physical activity, and diet) and health status (i.e., limited physical activity due to chronic condition, blood pressure, obesity, diabetes, BMI, and perceived health condition). The study also examined the differential effects of the social gradient in health among different racial/ethnic groups (i.e., non-Hispanic Whites, Blacks, Asian, Hispanics, and American Indians).

Study design: Cross-sectional study.

Methods: The data were from the adult 2009 California Health Interview Survey (CHIS). Weighted multivariable linear and logistic regression models were conducted to examine trends found between SES and health conditions and health behaviors. Polynomial trends were examined for all linear and logistic models to test for the possible effects (linear, quadratic, and cubic) of the social gradient on health behaviors and outcomes stratified by race/ethnicity.

Results: Findings indicated that, in general, Whites had more favorable health profiles in comparison to other racial/ethnic groups with the exception of Asians who were likely to be as healthy as or healthier than Whites. Predicted marginals indicated that Asians in the upper two strata of social class display the healthiest outcomes of health status among all other racial/ethnic groups. Also, the social gradient was differentially associated with health outcomes across race/ethnicity groups. While the social gradient was most consistently observed for Whites, education did not have the same protective effect on health among Blacks and American Indians. Also, compared to other minority groups, Hispanics and Asians were more likely to display curvilinear trends of the social gradient: an initial increase from low SES to mid-level SES was associated with worse health outcomes and behaviors; however, continued increase from mid-SES to high SES saw returns to healthy outcomes and behaviors.

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Conclusion: The study contributes to the literature by illustrating unique patterns and trends of the social gradient across various racial/ethnic populations in a nationally representative sample. Future studies should further explore temporal trends to track the impact of the social gradient for different racial and ethnic populations in tandem with indices of national income inequalities.

Keywords

Health disparities; SES; Race; Ethnicity; Social gradient

Introduction

More than half a century ago, the Whitehall Study uncovered the relationship between social class and death from coronary heart disease among British civil servants.[1] Since the landmark study, the literature has continued to provide strong evidence for the phenomenon referred to as the social gradient in explaining incremental disparities in health status and conditions.[2–4] The social gradient impacts health whereby members from the lowest levels of social class experience the worst health outcomes and members from the highest levels experience the best outcomes. Middle class members also experience poorer health status in comparison to those from the upper class. The social gradient effect has been demonstrated with various health conditions such as high blood pressure,[5] obesity/body weight,[6,7] Type 2 diabetes,[8] and general health and well-being.[9] The social gradient has also been linked to a variety of health behaviors, including tobacco use,[10,11] alcohol and substance use,[12] physical activity,[13] and dietary behaviors.[7,14]

The term socioeconomic status (SES) is often used to capture social class and refers to social and economic factors that influence an individual's positions in society.[15,16] Group members with lower SES experience poor health outcomes due to a number of possible mechanisms. One pathway from SES to health is through differential exposure to environmental hazards.[17,18] Another proposed pathway highlights differential access,[19–21] as health care access and other enabling factors (e.g., possession of health insurance and a regular provider) are associated with higher utilization of preventive and curative health services.[22–29] However, access to care does not entirely account for health inequality, demonstrated by existing disparities in health systems that utilize universal national insurance plans.[28,29] Disparate health outcomes are likely to arise from societal inequalities as well, underscored by a third pathway, which proposes that members from positions of lower SES endure a lifetime of exposure to institutionalized discrimination, prejudice in the medical system, and chronic stressors, resulting in maladaptive coping responses such as alcohol and substance abuse.[30,31]

The structural organization of power and privilege is a driver for health inequities. In addition to the social gradient, health disparities research in the U.S. often examines health as experienced by various racial/ethnic groups with race serving as a proxy for social class.[32,33] Though race/ethnicity and social class are highly interrelated, the distribution of power and privilege operates independently and in concert with race/ethnicity to impact health.[34,35] Relying on the social gradient as the theoretical framework for the present paper, it has been believed that there are two important themes to consider. First, race/ethnicity is sometimes

used to reflect social class when it is more accurately a proxy of social class in the U.S. due to confounding variables associated with racial/ethnic membership. Second, that while the social gradient operates across all racial/ethnic groups, it may manifest differently across subgroups. This is likely due to the intersection of race and social class, lending to sometimes synergistic effects on health outcomes. Both themes are discussed below.

Race/ethnicity is highly associated with SES in the U.S., and it is difficult to disentangle the effects of one from the other[29,30,36] as racial/ethnic minorities are disproportionately represented in lower levels of SES. Research on racial inequities in the U.S. repeatedly demonstrates that Blacks and American Indians experience the worst health profiles while Whites, in general, experience the best health profiles.[31,37] These patterns also exist in global trends in which infectious and chronic diseases disproportionately burden racial minority members who endure the highest levels of discrimination, oppression, and marginalization.[30,38–40] These racial/ ethnic differences most likely do not reflect genetic or inherent traits that lead to poor outcomes. Rather, for racial/ ethnic minority members, poverty interacts with racial segregation, leading to negative downstream consequences from poorer education, decreased employment opportunity, poorer built environments, less access to quality food markets, decreased social networks, and increased neighborhood violence.[41–44] Race and ethnicity are often used as proxies for social class in the epidemiological literature,[32,33] illustrating how economic, social, and political power can be distributed among different dimensions.[35]

While the social gradient phenomenon operates across race and ethnicity, its effects, directionality, and linear trends are not uniform. The social gradient may operate more strongly for some racial/ethnic groups as demonstrated by a study by Krieger and colleagues[35] that examined the role of the social gradient among different racial/ethnic groups across five major cancer sites: breast, cervix, colon, lung, and prostate. Findings demonstrated differential impact of the social gradient (in both magnitude and direction) among racial/ethnic groups and across cancer sites. Compared to all other racial/ethnic groups, the social gradient was strongest for White women with regard to cervical cancer incidence. With regard to colon and lung cancer, poorer Black and White respondents had higher incidence rates while higher incidence was found among the affluent Hispanics, demonstrating that reverse effects of social class can be found across race/ethnicity. The social gradient may also manifest in linear and non-linear patterns. Braveman and colleagues[45] examined socioeconomic disparities across multiple health indicators in the U.S., detailing the social gradient in health among White, Black, and Hispanic groups. While the study indicated linear trends of the social gradient for Whites and Blacks, the trend was less consistent for Hispanics. It is likely that the social gradient may not act in a linear fashion for some racial/ethnic minority groups due to the coinciding effects of acculturation.

The social gradient may act in curvilinear fashion for some racial/ethnic groups such as Hispanics and Asians as it relates to acculturative processes that occur within immigrant populations. Research shows that first generation immigrants display better health status than second generation immigrants; a phenomenon referred to as the immigration or acculturation paradox.[46,47]

As these racial/ethnic immigrant groups make gains in social class, they likely have increased exposure to the dominant culture and adopt associated attitudes and behaviors. This initial integration of mainstream values and behaviors through acculturation is associated with increased risky behaviors, including smoking, alcohol use, sedentary lifestyles, and poorer diet.[48–51] It has been hypothesized that beyond a certain point, further gains in social class may afford these racial/ethnic immigrant groups protective effects associated with higher SES such as decreased demarginalization, and as a result, lead to a return to healthier profiles. In order to ascertain the role of acculturation and elucidate the effects of race/ethnicity and the social gradient on health, the present study will analyze factors contributing to health behaviors and outcomes while controlling for acculturation.

The present study offers new and significant contributions to the literature by examining how the social gradient phenomenon may manifest differently across different racial/ethnic groups. This study relies on data from the California Health Interview Survey (CHIS), a large cohort, state representative sample with significant proportion of respondents from diverse racial/ethnic groups, particularly Asians and American Indians, groups that have been under examined in social gradient literature to date.[35,45] The study has three main objectives:

1. To examine the health profiles among the different racial/ethnic groups. Univariate analyses will demonstrate that Whites have the most favorable health profiles in comparison to all other racial groups (when not controlling for effects of the social gradient).

2. To assess the role of the social gradient on health outcomes and behaviors. It has been predicted that increasing levels of education and family income will be associated with positive health behaviors (i.e., smoking, drinking, physical activity, and diet) and health status (i.e., with limited activity due to chronic condition, blood pressure, obesity, diabetes, BMI, and perceived health condition).

3. To examine differential effects of the social gradient in health among different racial/ethnic groups. More linear gradient effects have been predicted among Whites and Blacks but more non-linear gradient effects among Hispanics and Asians while controlling for important covariates including acculturation.

Methods

The data come from the adult 2009 California Health Interview Survey (CHIS). The CHIS, the largest statewide health survey in the nation, collects data on multiple public health topics using a multistage sampling design and a random digit dial telephone survey (utilizing both landline and cell phone frames) to obtain a representative sample of respondents from California. Interviews are conducted in English, Spanish, and multiple Asian languages as CHIS oversamples racial/ethnic minority populations that are underrepresented in most health surveys. These populations include Hispanics/Latinos (including Mexicans, Guatemalans, and Puerto Ricans), African Americans, Asians (including Chinese, Filipinos, Japanese, Koreans, Vietnamese, and South Asians), Alaska Natives, and American Indians.

Detailed methodological information is available elsewhere.[52] Overall, there were a total of 47,200 adult respondents in this sample.

Measures

Health status.—Self-report measures included whether respondent physical activity was limited due to a chronic condition (1 = yes), whether respondents had high blood pressure (1 = has high blood pressure), whether respondents were obese (1 = is obese), and whether respondents had diabetes Type 2 (1 = has diabetes). Measures assessing self-reported BMI (continuous) and perceived health condition were also included (1 = poor and 5 = excellent).

Health behaviors.—Measures included current smoking status (1 = current smoker), sedentary lifestyle (1 = has a sedentary lifestyle by indicating no weekly vigorous or moderate physical activity), fruit and vegetable consumption in the past month (# of times consumed in the past month), fast food consumption in the past week (# of times consumed in the past week), and number of days in which respondents had four or more drinks in the past year.

Socio-economic status—While there exists numerous ways to measure SES, the most common metrics include educational attainment, income, occupation, and wealth.[16,53] Each measure has its limitations; some are more unstable (e.g., income) while others potentially reflect reverse causation patterns of health (e.g., occupation). This study used two measures to balance strengths and limitations of each: income provides an index of access to material resources, whereas education is less susceptible to reverse causation effects of health and is a stable property (i.e., does not decrease over the lifespan). Family income as percent of the federal poverty level (FPL) has four levels: 0–99%, 100–199%, 200–299%, and 300% and beyond. Educational attainment is also captured in four levels: less than a high school diploma, high school/GED completion, some college, and college degree and beyond.

Demographics and health care access—Demographic variables include age (measured in years), gender (1 = female), race/ethnicity (1 = non-Hispanic White, 2 = Black, 3 = Hispanic, 4 = Asian, and 5 = American Indian), and marital status (1 = married, 2 = living with a partner, 3 = widow/separated, and 4 = never married/single). Self-reported English proficiency was ascertained (1 = low proficiency and 3 = high proficiency) as a measure of acculturation. Though length of residency in the US or immigration status could have also captured acculturation for some racial/ethnic groups such as Hispanics or Asians, these measures would not have been appropriate for all racial/ethnic minority populations such as American Indians as these variables would have served as constant values during statistical modeling. Access to health care was measured by possession of health insurance (1 = insured and 0 = not insured) and usual source of care (1 = has a usual source and 0 = does not have a usual source).

Analyses

All analyses were conducted using SAS 9.3 and SAS-callable SUDAAN 10.0 statistical software to account for the complex sampling design of CHIS. Survey weights (final survey weights and replicate weights) were used to obtain population-level point estimates and to

get the correct variance estimates, respectively. All *P*-values reported are for 2-tailed tests and a value of <.05 was considered statistically significant. Weighted unadjusted linear and logistic models were conducted to examine differences in the health profiles between racial/ ethnic groups with Whites serving as the reference category. These univariate analyses assessed racial differences in access to care (insurance and source of care status), health conditions (limited activity due to chronic condition, high blood pressure, obesity, BMI, diabetes, and perceived health conditions) and health behaviors (physical activity, diet, smoking, and drinking.

Weighted multivariable linear and logistic regression models were conducted to examine trends found between SES (educational attainment or family income) and health conditions (limited physical activity due to chronic condition, high blood pressure, obesity, BMI, diabetes, and perceived health conditions) and health behaviors (physical activity, diet, smoking, and drinking). Age, gender, race/ethnicity, and acculturation were used as covariates in all models, except for race/ethnicity stratified analyses in which race was not controlled. Polynomial trends were examined for all linear and logistic models to test for the possible effects (linear, quadratic, and cubic) of the social gradient on health behaviors and outcomes stratified by racial membership. Predicted marginals were also computed for continuous and dichotomous outcomes in linear and logistic regression models and are reported for each of the four levels of educational attainment and family income. Predicted marginals provide predicted means and proportions after controlling for select covariates. All analyses were weighted to get population estimates.

Results

There were 12,731 (49%)[c] males and 18,395 (51%) females. In regards to race/ethnicity, there were 31,126 (50%) non-Hispanic Whites, 1939 (6%) Blacks, 7918 (29%) Hispanics, 4863 (14%) Asians, and 1354 (1%) American Indians. Pacific Islanders were dropped from the analyses due to a low sample size (*n* = 66). Participants who identified with more than one racial/ethnic group (*n* = 1015) were also excluded from analyses. Descriptive statistics for the sample can be found in Table 1.

Results of the unadjusted generalized linear models indicate that race was significantly associated with health profiles (see Table 2). In general, Whites, as a group, had greater access to care, decreased likelihood of chronic conditions, and increased levels of health behaviors in comparison to Blacks, Hispanics, Asians, and American Indians. There were a few exceptions. Blacks were less likely to drink alcohol in comparison to Whites. Hispanics were less likely than Whites to have limited physical activity due to a chronic condition, have high blood pressure, or drink alcohol. Asians were less likely than Whites to be current smokers, have limited physical activity due to a chronic condition, have high blood pressure, be obese or overweight, or drink alcohol.

Results of the trends analyses indicated that educational attainment and family income were significantly associated with all health status and health behavior variables for the total

[c]Counts are unweighted while percentages are weighted.

population, providing evidence for the social gradient after adjusting for age, gender, race, and acculturation (See Tables 3 and 4). Overall, higher SES was associated with better health outcomes and health behaviors after controlling for covariates for all racial/ethnic groups.

There were some discernable patterns found among racial/ ethnic categories. Race/ethnicity stratified analyses indicated that Whites demonstrated the most consistent effects of the social gradient collapsed across all outcomes for both educational attainment and family income. High blood pressure status was the only health outcome or status in which the social gradient was not significant for Whites. In contrast, the social gradient was observed the least for Blacks and American Indians, particularly when educational attainment was used to capture SES. In addition, predicted marginals indicated that Asians, in general, in the upper two levels of social class in both education (i.e., having received some college training or college degree) and family income (i.e., 200–299% or 300% FPL) display the healthiest measures of health status (physical activity limited due to chronic condition, high blood pressure, obesity, diabetes, and BMI) among all other racial/ ethnic groups.

In addition, racial/ethnic disparities in health outcomes are most pronounced in the lowest level of social class (i.e., those with a household income of 0–99% of FPL or those with less than a high school diploma). The differences in health status and behaviors between racial/ ethnic groups attenuate in the highest level of social class (i.e., those with a household income of 300% of FPL or those with a college degree or higher). This is observed in health status measures such as physical activity limited due to chronic conditions, diabetes, current smoking status, fruit and vegetable consumption, and alcohol consumption.

Hispanics and Asians were the most likely to demonstrate non-lineardi.e., quadratic or cubic– effects of the social gradient in comparison to other racial/ethnic groups. Gradient effects found in high blood pressure status, obesity, diabetes Type 2, BMI, smoking, drinking, fruit and vegetable consumption, and fast food consumption indicate that while lower SES was associated with healthier outcomes, mid-level SES was associated with the worse health outcomes and statuses. The highest levels of SES saw returns to healthy outcomes and statuses for Asians and Hispanics.

Discussion

The findings of the current study confirm general racial/ethnic health disparities found in previous studies as Whites had more favorable health profiles in comparison to other racial/ ethnic members. There were a few notable exceptions. Blacks, Hispanics, and Asians were less likely to drink alcohol than Whites. In addition, in comparison to other racial minority members, Asians were more likely to be as healthy, and in several domains of health outcomes, they appear healthier than Whites. Also, predicted marginals indicated that Asians in the upper two strata of social class in both education and family income display the healthiest outcomes of health status indicators (physical activity limited due to chronic condition, high blood pressure, obesity, diabetes, and BMI) among all other racial/ethnic groups. While Asian Americans represent the extremes of both SES and health indices[54]; it is possible that aggregated date may mask differences among Asian subpopulations. Further

investigation needs to focus on the role of the social gradient on disaggregated data on Asians to determine differences among subgroups.

Moreover, the analyses noted distinctly different ways in which social gradient is associated with health outcomes across race/ethnicity groups. First, this study found a differential effect of education and income on health across racial/ ethnic groups. While the social gradient was most consistently observed for Whites, education does not have the same protective effect on health among Blacks and American Indians. This finding is consistent with studies that examine the weakened impact of the social gradient for racial/ethnic groups on smoking, drinking, obesity, low birth weight in infants, and depression.[55–57] The differential effects of social gradient point to the possibility that education does not confer similar benefits across races, possibly due to inequities in the quality of education/schools, the effect of discrimination, as well as potentially lower wages and worse job opportunities for racial/ ethnic minorities.

Finally, compared to other minority groups, Hispanics and Asians were more likely to display curvilinear trends of the social gradient. This partially echoes findings by Braveman and colleagues[45] showing that linear trends were more consistently found for Whites and Blacks but less consistently for Hispanics. Despite adjusting for acculturation in the present study, patterns suggest that an initial increase from low SES to mid-level SES was associated with worse health outcomes and behaviors among Hispanics and Asians; however, continued increase from mid-SES to high SES saw returns to healthy outcomes and behaviors. Some possible explanations include the cultural discrepancy hypothesis, which suggests that multicultural members experience increased distress and social anxiety within a context where discrepancies with the mainstream culture are salient (particularly with higher SES status), resulting in reliance on negative and unhealthy coping strategies.[58] These discrepancies may be reconciled once members reach the highest social classes. Another explanation has to do with the recent migration experience for first generation immigrants of Asian and Hispanic origins. Individuals with high levels of education may immigrate to the United States due to political and socioeconomic reasons (e.g., the Vietnamese or Cubans) and earn lower income than what is commensurate for their educational status. This may partially explain the immigration or acculturation paradox that occurs when first generation immigrants display better health status than second generation immigrants.[46,47] Thus, the educational gradient in health may be stronger for U.S. educated immigrants rather than foreign-educated immigrants.[59,60] In addition, a study by Bates and colleagues[34] indicated that social gradients in obesity only emerged for third-generation individuals, confirming that generational status or length of residency in the US may moderate the strength of the social gradient in health among Asian and Hispanic immigrants.

Study limitations

The study suffered from a few limitations. Though the CHIS collects data on specific Asian and Hispanic subgroups (e.g., Chinese, Korean, Filipino, and Vietnamese), the authors relied on aggregated data for Asians and Hispanics, potentially masking subgroup differences. Future studies should utilize statistical and methodological techniques that focus on integrating independent data sets together and analyzing them as a whole, a method that has

been referred to as integrative data analysis (IDA),[61] a technique that merges raw data and is a useful method to examine small populations such as racial/ ethnic subgroups. In addition, though they tested for non-linear trends of the social gradient across multiple racial/ ethnic groups, they were unable to test for the interaction between race/ethnicity and SES given the numerous subgroups associated with each indicator. Future studies should examine the intersection of race/ethnicity, social class, and also acculturation to assess possible synergistic effects on health outcomes.

The study relied on two measures of SES: education and income. Income provides access to goods and services that influences health and adjustment; however, income is not a stable measure and does not measure assets.[15] In addition, there is concern for the potential bidirectional relationship between income and personal health: reduction in income may lead to poor health status but also may be caused by poorer health status.[62] Educational attainment, however, remains stable and does not change after credentialing occurs and is less susceptible to reverse causation with health outcomes. However, education does not confer the same benefits to different racial and ethnic groups. The authors acknowledge that no one indicator of SES is interchangeable for another, and the reliance on two indices avoids faulty inferences made on SES and health. The study's findings shed light on how different metrics of SES can capture different health pathways.

Conclusions

The present study presents a comprehensive examination of the social gradient in multiple health outcomes and behaviors. It contributes to the literature by illustrating unique patterns and trends of the social gradient across various racial/ethnic populations in a nationally representative sample. Presently, the extent of social inequality contributes to the health of a nation as the average health status of a person is determined by income differences between the poorest and richest members of society.[4,63] The U.S. Gini index, a measure of income inequality, has steadily increased during the last 25 years with recent data suggesting that it has only started to slow.[64] The interplay between race/ethnicity and SES on health is complex, and the reduction of health inequities must be approached with unique solutions for various populations as education or income do not confer comparable protective effects across groups.

Acknowledgments

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Table 1 –

Population descriptives.

	White	Black	Hispanic	Asian	Am. Indian	All[a]
	$n = 31126$	$n = 1939$	$n = 7918$	$n = 4863$	$n = 1354$	$N = 47200$
	n (%)[b] or mean (standard error)[c]					
Demographics						
Gender						
Male	12731 (49%)	702 (45%)	3127 (50%)	2127 (47%)	569 (54%)	19328 (49%)
Female	18395 (51%)	1237 (55%)	4791 (50%)	2736 (53%)	785 (46%)	28086 (51%)
Education						
<High school diploma	1140 (5%)	160 (13%)	2616 (38%)	479 (8%)	188 (21%)	4604 (16%)
High school graduate	6400 (26%)	480 (31%)	2155 (30%)	958 (20%)	373 (31%)	10458 (27%)
Some college	5778 (17%)	403 (20%)	1021 (13%)	465 (11%)	294 (21%)	8041 (15%)
College graduate and +	16888 (53%)	822 (37%)	1704 (19%)	2856 (61%)	438 (27%)	22907 (42%)
Income as % of FPL						
0–99% of FPL	1889 (7%)	350 (20%)	2390 (30%)	817 (12%)	273 (26%)	5764 (16%)
100–199% of FPL	3996 (11%)	416 (22%)	2292 (28%)	953 (18%)	314 (23%)	8026 (18%)
200–299% of FPL	4254 (13%)	287 (15%)	1105 (15%)	620 (13%)	207 (14%)	6532 (14%)
300%+ of FPL	20987 (69%)	886 (43%)	2131 (27%)	2473 (57%)	560 (37%)	27292 (52%)
Marital status						
Married	16197 (59%)	662 (36%)	4084 (50%)	3210 (58%)	590 (46%)	24936 (54%)
Living with a partner	1378 (7%)	88 (5%)	652 (10%)	101 (3%)	88 (7%)	2336 (7%)
Widowed/separated/divorced	9804 (16%)	714 (22%)	1578 (12%)	725 (8%)	456 (22%)	13360 (14%)
Never married/single	3747 (18%)	475 (37%)	1604 (28%)	827 (30%)	220 (26%)	6982 (24%)
Access to care						
Health insurance						
Yes	29112 (90%)	1746 (80%)	5857 (69%)	4226 (86%)	1154 (77%)	42468 (82%)
No	2014 (10%)	193 (20%)	2061 (31%)	637 (14%)	200 (23%)	5146 (18%)
Usual source of care						
Yes	21248 (87%)	1371 (78%)	4878 (71%)	2719 (78%)	911 (80%)	31420 (80%)
No	2132 (13%)	184 (22%)	1634 (29%)	746 (22%)	153 (20%)	4906 (20%)

[a]Represents White, Black, Hispanic, Asian, and American Indian respondents.

[b]Counts are unweighted, %s are weighted.

[c]Means and standard errors are weighted.

Table 2 –

Racial health profiles.

	White (REF)	Black	Hispanic	Asian	Am. Indian	P-value
	n = 31126	n = 1939	n = 7918	n = 4863	n = 1354	F-test
	OR or Mean (95% C.I.)					
Health Insurance	1	.47 (.37; .61) **	.26 (.22; .32) **	.74 (.57; .96) *	.40 (.31; .51) **	.00
Usual Source of Care	1	.51 (.37; .72) **	.36 (.31; .43) **	.53 (.42; .68) **	.60 (.46; .80) **	.00
Current Smoker	1	1.21 (.98; 1.49)	.86 (.73; 1.02)	.69 (.52; .91) **	1.57 (1.23; 2.00) **	.00
Limited Physical Activity	1	1.11 (.90; 1.37)	.80 (.72; .90) **	.48 (.40; .57) **	1.83 (1.15; 2.22) **	.00
High Blood Pressure	1	1.47 (1.22; 1.78) **	.82 (.74; .91) **	.76 (.67; .87) **	1.48 (1.15; 1.89) **	.00
Obese	1	1.42 (1.17; 1.73) **	1.58 (1.41; 1.77) **	.29 (.23; .37) **	2.18 (1.73; 2.75) **	.00
Diabetes (Type 2)	1	2.16 (1.58; 2.95) **	1.80 (1.52; 2.12) **	1.25 (.95; 1.71)	3.06 (1.92; 4.38) **	.00
Sedentary	1	1.23 (1.04; 1.46) *	1.11 (1.01; 1.23) *	1.41 (1.23; 1.61) **	1.12 (.91; 1.38)	.00
Monthly Fruit	32.88 (32.16; 33.61)	28.15 (26.35; 29.96) **	32.9 (31.71; 34.09)	31.66 (29.61; 33.72)	32.17 (29.19; 35.15)	.00
Monthly Vegetable	33.49 (32.98; 34.00)	26.03 (24.26; 27.80) **	22.19 (21.14; 23.24) **	31.14 (29.58; 32.71)	29.46 (26.89; 32.02) **	.00
Week Fastfood	1.39 (1.33; 1.45)	2.00 (1.60; 2.40) **	1.70 (1.59; 1.81) **	1.31 (1.18; 1.43)	1.97 (1.61; 2.34) **	.00
4 + Drinks Year	12.49 (11.34; 13.65)	8.37 (4.64; 12.10) *	9.70 (7.52; 11.88) *	4.77 (3.25; 6.29) **	24.93 (3.72; 46.13)	.00
BMI	26.49 (26.36; 26.62)	27.93 (27.38; 28.48) **	28.09 (27.85; 28.32) **	23.87 (23.62; 24.13) **	28.59 (27.95; 29.23) **	.00
Perceived Health	3.71 (3.69; 3.74)	3.34 (3.24; 3.43) **	3.18 (3.14; 3.23) **	3.50 (3.44; 3.55) **	3.23 (3.08; 3.39) **	.00

*
Signficantly differs from reference group at $P < .05$.

**
Significantly differs from reference group at $P < .01$.

Table 3 –

Multivariate models to test effects of educational attainment on various health conditions and behaviors by race/ethnicity.

Health Indicator by Racial categories	Educational Attainment				Tests for trends (P)		
	<High school graduate (% or mean)	High school graduate (% or mean)	Some college (% or mean)	College graduate and higher (% or mean)	X^3	X^2	X
	Predicted marginals (95% confidence intervals)						
Health status							
Activity limited due to condition % (95% CI)							
All	22 (20.10, 24.02)	16 (14.14, 18.06)	15 (13.14, 17.07)	12 (10.17, 14.10)	.01	**	<.001
White	29 (25.24, 33.08)	19 (17.12, 21.04)	20 (18.11, 22.03)	14 (12.15, 16.08)	<.001	**	<.001
Black	31 (19.53, 46.17)	19 (15.38, 23.24)	18 (12.83, 24.66)	14 (10.51, 18.40)	**	**	.01
Hispanic	18 (14.41, 22.26)	12 (10.17, 14.10)	10 (6.70, 14.67)	10 (6.70, 14.66)	**	.05	.01
Asian	9 (5.77, 13.78)	11 (7.64, 15.58)	8 (3.76, 16.23)	9 (7.22, 11.16)	**	**	**
American Indian	36 (25.18, 48.46)	30 (19.64, 43.91)	25 (17.97, 33.65)	15 (10.00, 21.89)	**	**	<.001
High blood pressure % (95% CI)							
All	30 (26.23, 34.06)	29 (27.08, 31.00)	30 (28.08, 32.00)	23 (23.00, 23.00)	.01	<.001	<.001
White	33 (29.20, 37.04)	32 (30.07, 33.99)	31 (29.08, 32.99)	25 (23.09, 27.01)	**	.01	<.001
Black	34 (24.91, 44.44)	39 (31.48, 47.08)	41 (31.64, 51.06)	32 (28.21, 36.05)	**	**	**
Hispanic	26 (22.27, 30.11)	24 (20.30, 28.14)	27 (21.53, 33.27)	16 (14.14, 18.06)	.05	.01	<.001
Asian	29 (18.73, 42.00)	22 (16.68, 28.44)	31 (22.11, 41.56)	21 (19.11, 23.03)	.04	**	**
American Indian	35 (24.24, 47.53)	38 (27.09, 50.28)	34 (26.62, 42.25)	40 (32.45, 48.05)	**	**	**
Obese % (95% CI)							
All	28 (26.08, 30.00)	26 (24.09, 28.01)	25 (23.09, 27.01)	18 (16.12, 20.04)	.01	<.001	<.001
White	23 (19.31, 27.16)	26 (24.09, 28.01)	25 (23.09, 27.01)	17 (15.13, 19.05)	**	<.001	.01
Black	19 (12.31, 28.16)	33 (25.66, 41.27)	33 (25.66, 41.13)	23 (19.31, 27.16)	**	<.001	**
Hispanic	36 (32.18, 40.01)	31 (27.22, 35.05)	26 (20.56, 32.23)	20 (16.36, 24.21)	**	**	<.001
Asian	7 (3.95, 12.10)	8 (4.86, 12.91)	18 (11.42, 27.21)	5 (3.37, 7.37)	.02	<.001	**
American Indian	40 (27.27, 54.24)	38 (27.09, 50.28)	34 (24.94, 44.41)	37 (29.54, 45.14)	**	**	**
Diabetes Type 2 % (95% CI)							
All	10 (8.20, 12.14)	7 (5.28, 9.23)	8 (6.25, 10.19)	5 (3.37, 7.37)	<.001	**	<.001
White	8 (6.24, 10.20)	7 (5.28, 9.23)	6 (4.31, 8.29)	4 (2.44, 6.49)	**	**	<.001

Health Indicator by Racial categories	Educational Attainment				Tests for trends (P)		
	<High school graduate (% or mean)	High school graduate (% or mean)	Some college (% or mean)	College graduate and higher (% or mean)	X³	X²	X
Black	14 (6.69, 26.99)	12 (7.24, 19.24)	11 (7.64, 15.59)	10 (6.70, 14.67)	**	**	**
Hispanic	9 (5.77, 13.77)	7 (5.28, 9.23)	14 (9.08, 20.98)	5 (3.37, 7.37)	<.001	.02	**
Asian	20 (10.69, 34.12)	6 (3.08, 11.35)	8 (3.08, 16.23)	5 (3.37, 7.37)	**	**	<.001
American Indian	16 (8.38, 28.41)	17 (7.17, 35.20)	20 (11.91, 31.62)	11 (6.33, 18.42)	**	**	**
BMI M (95% CI)							
All	28.52 (28.12, 28.92)	27.73 (27.501, 28.00)	27.84 (27.53, 28.16)	26.84 (26.63, 27.06)	<.001	**	<.001
White	26.83 (26.20, 27.46)	27.37 (27.13, 27.60)	27.38 (27.01, 27.76)	26.40 (26.19, 26.61)	**	<.001	**
Black	27.78 (26.10, 29.46)	28.51 (27.48, 29.53)	29.09 (28.25, 29.94)	27.82 (27.13, 28.50)	**	**	**
Hispanic	29.41 (28.97, 29.85)	28.43 (28.10, 28.77)	28.18 (27.43, 28.92)	26.73 (26.20, 27.27)	**	**	<.001
Asian	24.90 (24.02, 25.79)	23.95 (23.44, 24.45)	25.10 (23.78, 26.42)	23.64 (23.36, 23.93)	.03	**	**
American Indian	29.60 (28.09, 31.10)	28.05 (27.14, 28.10)	27.67 (26.55, 28.79)	28.40 (27.68, 29.12)	**	**	**
Perceived health M (95% CI)							
All	2.90 (2.83, 2.97)	3.20 (3.16, 3.25)	3.27 (3.21, 3.34)	3.59 (3.55, 3.63)	<.001	**	<.001
White	2.99 (2.85, 3.13)	3.44 (3.40, 3.48)	3.51 (3.46, 3.56)	3.82 (3.79, 3.85)	<.001	**	<.001
Black	2.71 (2.43, 3.00)	3.10 (2.92, 3.27)	3.22 (3.04, 3.41)	3.46 (3.33, 3.59)	**	**	<.001
Hispanic	2.92 (2.84, 3.00)	3.14 (3.07, 3.21)	3.19 (3.06, 3.312)	3.48 (3.38, 3.58)	**	**	<.001
Asian	2.75 (2.58, 2.92)	3.14 (3.00, 3.28)	3.07 (2.76, 3.37)	3.49 (3.43, 3.56)	**	**	<.001
American Indian	3.06 (2.67, 3.44)	3.05 (2.73, 3.37)	3.23 (3.05, 3.42)	3.55 (3.37, 3.73)	**	**	.01
Health behaviors							
Current smoker % (95% CI)							
All	22 (18.33, 26.17)	17 (15.13, 19.05)	15 (13.14, 17.07)	8 (6.24, 10.19)	.05	<.001	<.001
White	33 (27.40, 39.13)	20 (18.11, 22.03)	16 (14.14, 18.06)	9 (7.22, 11.16)	**	**	<.001
Black	27 (14.23, 45.19)	23 (17.64, 29.41)	17 (11.88, 23.73)	7 (5.27, 9.24)	**	**	<.001
Hispanic	16 (14.14, 18.06)	13 (11.16, 15.09)	11 (7.64, 15.58)	7 (5.28, 9.23)	**	**	<.001
Asian	11 (6.34, 18.41)	14 (9.08, 20.98)	22 (12.43, 35.93)	7 (5.28, 9.23)	**	.02	**
American Indian	33 (22.38, 45.69)	22 (15.14, 30.85)	17 (10.49, 26.35)	15 (8.70, 24.64)	**	**	.03
Sedentary % (95% CI)							
All	43 (39.13, 47.00)	38 (36.06, 39.98)	34 (32.07, 35.99)	30 (28.08, 32.00)	**	**	<.001
White	45 (39.21, 50.93)	38 (36.06, 39.98)	33 (31.07, 34.99)	29 (27.08, 31.00)	**	**	<.001

Health Indicator by Racial categories	Educational Attainment				Tests for trends (P)		
	<High school graduate (% or mean)	High school graduate (% or mean)	Some college (% or mean)	College graduate and higher (% or mean)	X³	X²	X
Black	43 (28.36, 5.90)	40 (34.28, 46.01)	44 (34.52, 53.94)	31 (25.44, 37.17)	**	**	**
Hispanic	40 (36.15, 43.98)	35 (31.19, 39.02)	29 (23.48, 35.22)	28 (24.25, 32.09)	**	**	<.001
Asian	47 (32.06, 62.50)	42 (34.41, 49.99)	45 (33.69, 56.85)	37 (33.17, 41.00)	**	**	**
American Indian	37 (26.11, 49.39)	39 (28.02, 51.22)	38 (27.08, 50.29)	27 (19.89, 35.53)	**	**	**
Fruit past month M (95% CI)							
All	29.31 (27.20, 31.43)	29.36 (28.26, 30.46)	32.61 (30.78, 34.44)	35.86 (34.92, 36.81)	**	.05	<.001
White	26.24 (23.35, 29.14)	28.80 (27.93, 29.68)	32.85 (31.11, 34.60)	37.95 (37.00, 38.91)	**	**	<.001
Black	24.54 (19.95, 29.13)	25.21 (22.16, 28.25)	25.70 (22.16, 29.25)	32.86 (28.83, 36.89)	**	**	.01
Hispanic	32.93 (30.72, 35.14)	31.46 (29.10, 33.83)	34.32 (30.43, 38.20)	36.05 (33.20, 38.90)	**	**	**
Asian	33.08 (22.81, 43.35)	36.10 (32.28, 39.92)	40.27 (30.45, 50.09)	32.99 (30.83, 35.20)	**	**	**
American Indian	25.26 (18.84, 31.68)	31.71 (26.01, 37.41)	39.84 (24.91, 36.26)	39.84 (34.50, 45.19)	**	**	<.001
Vegetable past month M (95% CI)							
All	23.92 (22.46, 25.37)	26.05 (25.12, 26.98)	29.72 (28.39, 31.05)	33.47 (32.47, 34.47)	**	**	<.001
White	25.93 (24.03, 27.82)	29.18 (28.43, 29.93)	32.59 (31.38, 33.80)	37.85 (37.13, 38.57)	**	**	<.001
Black	23.18 (18.30, 28.06)	21.70 (19.15, 24.24)	26.90 (23.05, 30.74)	28.48 (25.67, 31.29)	**	**	.02
Hispanic	19.78 (18.212, 21.33)	20.02 (19.20, 22.84)	21.78 (19.93, 23.62)	30.49 (26.47, 34.52)	**	.01	<.001
Asian	31.69 (27.96, 35.42)	30.20 (26.99, 33.40)	42.24 (32.58, 51.91)	32.30 (30.87, 33.74)	.01	**	**
American Indian	24.08(19.70, 28.46)	28.36 (24.94, 31.77)	33.24 (29.17, 37.31)	37.01 (31.10, 42.92)	**	**	<.001
Fast food past week M (95% CI)							
All	1.56 (1.29, 1.83)	1.69 (1.58, 1.80)	1.54 (1.40, 1.69)	1.26 (1.17, 1.35)	**	.01	<.001
White	1.43 (1.12, 1.73)	1.44 (1.33, 1.56)	1.26 (1.07, 1.46)	1.01 (.95, 1.07)	**	**	<.001
Black	3.44 (1.01, 5.86)	1.53 (1.24, 1.82)	1.84 (1.29, 2.38)	1.39 (1.16, 1.63)	**	**	**
Hispanic	1.52 (1.35, 1.69)	1.82 (1.61, 2.04)	1.68 (1.39, 1.96)	1.27 (1.07, 1.46)	**	<.001	**
Asian	.73 (0.43, 1.04)	1.42 (1.08, 1.76)	1.08 (.74, 1.41)	1.06 (.94, 1.19)	**	.01	**
American Indian	1.84 (1.24, 2.44)	1.67 (1.39, 1.95)	1.87 (1.38, 2.36)	1.34 (1.17, 1.52)	**	**	**
Had 4+ drinks past month M (95% CI)							
All	12.51 (6.93, 18.09)	12.58 (6.76, 18.40)	9.01 (4.70, 13.31)	6.81 (2.61, 11.02)	**	**	<.001
White	25.04 (13.120, 36.88)	12.27 (10.06, 14.49)	9.99 (7.19, 12.79)	6.93 (5.72, 8.14)	**	**	<.001
Black	.00 (.00, 5.05)	4.80 (.00, 12.145)	3.89 (1.04, 12.73)	10.28 (2.56, 18.00)	**	**	**

Health Indicator by Racial categories	Educational Attainment				Tests for trends (*P*)		
	<High school graduate (% or mean)	High school graduate (% or mean)	Some college (% or mean)	College graduate and higher (% or mean)	X³	X²	X
Hispanic	9.59 (6.26, 12.92)	9.92 (5.52, 14.32)	6.57 (0.75, 12.36)	1.00 (.00, 4.76)	**	.02	.04
Asian	2.52 (.00, 5.68)	3.85 (1.84, 5.87)	1.46 (.00, 3.04)	3.72 (1.98, 5.46)	.04	**	**
American Indian	.77 (.00, 32.71)	54.82 (.00, 121.10)	7.88 (.00, 16.60)	15.36 (7.16, 23.56)	**	**	**

**
not significant.

Table 4 –

Multivariate models to test effects of household income on various health conditions and behaviors by race/ethnicity.

Health Indicator by Racial categories	Household income as % of federal poverty level (FPL)				Tests for trends (P)		
	0–99% of FPL	100–199% of FPL	200–299% of FPL	300% and above of FPL	X³	X²	X
Health status							
Activity limited due to condition % (95% CI)							
All	24 (22.10, 26.02)	22 (20.10, 24.02)	17 (15.13, 19.05)	11 (9.19, 13.12)	**	<.001	<.001
White	31 (27.22, 35.05)	26 (22.27, 30.11)	21 (19.11, 23.03)	14 (12.15, 16.08)	**	**	<.001
Black	29 (21.80, 37.44)	22 (15.14, 30.84)	20 (11.91, 31.62)	12 (8.59, 16.51)	**	**	<.001
Hispanic	18 (16.12, 20.05)	17 (15.13, 19.05)	12 (10.17, 14.11)	8 (6.25, 10.19)	**	**	<.001
Asian	9 (5.77, 13.77)	13 (9.55, 17.45)	7 (3.95, 12.10)	8 (6.25, 10.19)	.05	**	**
American Indian	46 (7.22, 11.16)	27 (32.85, 59.74)	33 (19.44, 50.13)	14 (10.51, 18.41)	.05	**	<.001
High blood pressure % (95% CI)							
All	30 (28.08, 32.00)	29 (27.08, 31.00)	29 (27.08, 31.00)	25 (23.09, 27.01)	**	**	<.001
White	31 (25.44, 37.17)	32 (30.07, 33.99)	31 (29.07, 32.99)	27 (25.09, 29.00)	**	**	**
Black	38 (30.50, 46.12)	41 (31.64, 51.06)	40 (30.67, 50.12)	32 (26.42, 38.15)	**	**	**
Hispanic	25 (21.29, 29.12)	24 (22.09, 26.02)	26 (20.56, 32.30)	22 (18.33, 26.17)	**	**	**
Asian	28 (19.29, 38.76)	25 (19.58, 31.33)	25 (19.58, 31.34)	20 (18.11, 22.03)	**	**	**
American Indian	47 (33.77, 60.66)	32 (24.69, 40.32)	37 (26.12, 49.38)	32 (26.41, 38.16)	**	**	.05
Obese % (95% CI)							
All	25 (23.09, 27.01)	26 (24.09, 28.01)	26 (24.09, 28.01)	20 (18.11, 22.03)	**	<.001	<.001
White	24 (20.30, 28.14)	24 (20.30, 28.14)	27 (23.26, 31.10)	19 (17.12, 21.04)	**	.01	**
Black	27 (19.88, 35.38)	29 (21.80, 37.44)	31 (22.09, 41.58)	25 (21.28, 29.13)	**	**	**
Hispanic	31 (27.22, 35.05)	31 (37.22, 35.05)	33 (27.40, 39.13)	25 (21.29, 29.12)	**	.04	**
Asian	12 (6.09, 22.29)	13 (6.95, 23.03)	7 (3.95, 12.10)	5 (3.37, 7.37)	**	**	.02
American Indian	45 (31.92, 58.81)	36 (26.85, 46.30)	30 (19.61, 42.95)	34 (26.63, 42.23)	**	**	**
Diabetes Type 2 % (95% CI)							
All	10 (8.20, 12.14)	8 (6.25, 10.19)	7 (5.28, 9.23)	6 (4.31, 8.29)	**	**	<.001
White	7 (5.28, 9.23)	7 (3.96, 12.09)	7 (5.28, 9.23)	5 (3.37, 7.37)	**	.01	.01
Black	15 (8.69, 24.65)	11 (6.34, 18.42)	9 (5.76, 13.79)	10 (6.70, 14.67)	**	**	**
Hispanic	10 (8.20, 12.14)	8 (6.25, 10.19)	7 (5.27, 9.23)	8 (6.25, 10.19)	**	**	**

Health Indicator by Racial categories	Household income as % of federal poverty level (FPL)				Tests for trends (P)		
	0–99% of FPL	100–199% of FPL	200–299% of FPL	300% and above of FPL	X³	X²	X
Asian	14 (6.72, 26.89)	10 (5.46, 17.61)	5 (3.36, 7.37)	5 (3.37, 7.37)	**	**	<.001
American Indian	25 (12.58, 43.57)	12 (7.23, 19.26)	17 (9.24, 29.17)	10 (5.46, 17.62)	**	**	**
BMI M (95% CI)							
All	27.93 (27.55, 28.31)	27.84 (27.58, 28.11)	28.00 (27.54, 28.46)	27.10 (26.89, 27.30)	**	**	<.001
White	27.13 (26.61, 27.66)	27.22 (26.91, 27.54)	27.88 (27.25, 28.52)	26.34 (26.46, 26.71)	.04	<.001	**
Black	28.29(27.14, 29.43)	28.16 (27.02, 29.30)	28.61 (27.13, 30.09)	28.17 (27.58, 28.76)	**	**	**
Hispanic	28.85 (28.46, 29.24)	28.69 (28.30, 29.09)	28.81 (28.22, 29.42)	27.69 (27.18, 28.20)	**	**	<.001
Asian	24.33 (23.59, 25.07)	24.71 (23.86, 25.57)	23.73 (23.06, 24.40)	23.66 (23.29, 24.04)	**	**	**
American Indian	29.26 (27.92, 30.60)	28.20 (26.98, 29.42)	27.76 (26.54, 28.99)	28.05 (27.46, 28.64)	**	**	**
Perceived health M (95% CI)							
All	2.88 (2.81, 3.00)	3.05 (2.98, 3.12)	3.26 (3.20, 3.32)	3.56 (3.53, 3.60)	**	.01	<.001
White	3.17 (3.04, 3.29)	3.19 (3.10, 3.28)	3.43 (3.36, 3.51)	3.76 (3.73, 3.78)	**	<.001	<.001
Black	2.72 (2.53, 2.92)	2.99 (2.76, 3.21)	3.33 (3.145, 3.51)	3.46 (3.36, 3.56)	**	**	<.001
Hispanic	2.82 (2.75, 2.901)	2.99 (2.91, 3.07)	3.16 (3.05, 3.28)	3.46 (3.37, 3.56)	**	**	<.001
Asian	2.85 (2.67, 3.03	3.05 (2.85, 3.26)	3.23 (3.05, 3.42)	3.54 (3.47, 3.62)	**	**	<.001
American Indian	2.59 (2.19, 3.00)	3.25 (3.04, 3.46)	3.35 (3.08, 3.63)	3.48 (3.35, 3.62)	**	.04	<.001
Health behaviors							
Current smoker % (95% CI)							
All	19 (17.12, 21.04)	19 (17.12, 21.04)	16 (14.14, 18.06)	10 (8.20, 12.14)	**	<.001	<.001
White	27 (21.53, 33.27)	23 (19.31, 27.15)	19 (15.38, 23.23)	11 (9.19, 13.12)	**	**	<.001
Black	24 (15.56, 35.13)	23 (16.08, 31.77)	16 (9.59, 25.50)	10 (8.20, 12.14)	**	**	<.001
Hispanic	15 (13.14, 17.07)	15 (11.48, 19.36)	12 (8.60, 16.51)	9 (7.22, 11.16)	**	**	.02
Asian	12 (7.24, 19.24)	12 (7.24, 19.23)	13 (6.94, 23.03)	9 (7.22, 11.16)	**	**	**
American Indian	33 (22.40, 45.66)	16 (10.94, 22.81)	19 (13.77, 25.62)	16 (10.94, 22.80)	**	**	.02
Sedentary % (95% CI)							
All	45 (41.12, 48.94)	41 (39.06, 42.87)	35 (33.07, 36.99)	30 (28.08, 32.00)	**	**	<.001
White	42 (36.26, 47.97)	43 (39.13, 46.96)	37 (33.17, 41.00)	30 (28.08, 32.00)	**	**	<.001
Black	45 (35.48, 54.90)	48 (38.37, 57.78)	36 (25.20, 48.43)	30 (26.23, 34.07)	**	**	<.001
Hispanic	43 (39.13, 47.00)	36 (32.18, 40.01)	31 (27.22, 35.05)	29 (25.24, 33.07)	**	**	<.001
Asian	51 (7.24, 19.24)	48 (7.24, 19.23)	36 (6.94, 23.03)	37 (7.22, 11.16)	**	**	.01

Health Indicator by Racial categories	Household income as % of federal poverty level (FPL)				Tests for trends (P)		
	0–99% of FPL	100–199% of FPL	200–299%of FPL	300% and above of FPL	X³	X²	X
American Indian	49 (35.63, 62.52)	37 (27.80, 47.25)	35 (21.21, 51.86)	25 (19.58, 31.34)	**	**	.01
Fruit past month M (95% CI)							
All	29.37 (27.62, 31.12)	32.75 (31.01, 34.49)	31.94 (30.20, 33.68)	33.33 (32.39, 34.28)	**	**	<.001
White	27.53 (24.73, 30.34)	32.71 (29.48, 35.95)	31.93 (29.92, 33.94)	35.16 (34.44, 35.87)	**	**	<.001
Black	25.98 (22.53, 29.43)	24.29 (20.44, 28.14)	25.96 (21.13, 30.79)	32.57 (29.52, 35.62)	**	.02	<.001
Hispanic	31.94 (29.68, 34.20)	35.50 (32.71, 38.28)	33.99 (30.59, 37.40)	32.23 (29.94, 34.52)	**	.05	**
Asian	34.90 (27.00, 42.79)	36.37 (30.03, 42.71)	36.04 (31.92, 40.16)	32.28 (29.93, 34.62)	**	**	**
American Indian	26.60 (20.69, 32.51)	30.45 (26.37, 34.53)	31.09 (22.39, 39.79)	36.16 (31.59, 40.73)	**	**	.03
Vegetable past month M (95% CI)							
All	26.39 (24.87, 27.90)	27.27 (25.71, 28.82)	28.24 (26.81, 29.67)	31.24 (30.43, 32.06)	**	**	<.001
White	27.99 (25.67, 30.30)	29.49 (27.67, 31.32)	32.16 (30.41, 33.91)	35.61 (35.10, 36.13)	**	**	<.001
Black	23.07 (19.74, 26.40)	26.22 (22.31, 30.13)	22.81 (20.37, 25.26)	27.54 (25.10, 29.98)	**	**	**
Hispanic	21.00 (19.19, 22.80)	22.34 (19.69, 24.98)	21.84(19.26, 24.41)	24.21 (21.99, 26.44)	**	**	**
Asian	35.67 (29.52, 41.83)	28.89 (25.33, 32.44)	31.71 (28.29, 35.13)	32.97 (31.35, 34.60)	**	**	**
American Indian	29.81 (23.27, 36.35)	28.88 (25.79, 31.97)	31.38 (25.49, 37.28)	32.88 (29.65, 36.10)	**	**	**
Fast food past week M (95% CI)							
All	1.50 (1.25, 1.75)	1.59 (1.44, 1.75)	1.98 (1.62, 2.00)	1.34 (1.26, 1.47)	.04	<.001	**
White	1.00 (.81, 1.20)	1.38 (1.23, 1.52)	1.66 (1.36, 1.96)	1.09 (1.04, 1.13)	**	<.001	**
Black	2.69 (1.11, 4.27)	1.75 (1.23, 2.27)	1.64 (1.30, 2.00)	1.50 (1.26, 1.74)	**	**	**
Hispanic	1.47 (1.30, 1.64)	1.62 (1.40, 1.83)	1.83 (1.52, 2.14)	1.48 (1.29, 1.66)	**	**	**
Asian	1.14 (.76, 1.53)	1.29 (.95, 1.63)	1.12 (.83, 1.41)	.96 (.83, 1.10)	**	.03	**
American Indian	1.77 (1.21, 2.33)	1.46 (1.12, 1.80)	2.50 (1.02, 4.00)	1.65 (1.36, 1.94)	**	**	**
4+ drinks year M (95% CI)							
All	13.28 (5.43, 21.14)	9.52 (5.52, 13.52)	9.87 (4.64, 15.11)	8.19 (4.50, 11.88)	**	**	.05
White	16.36 (7.82, 24.90)	10.83 (6.89, 14.76)	11.98 (8.780, 15.15)	8.36 (7.301, 9.40)	**	**	**
Black	15.53 (.00, 33.24)	9.11 (3.389, 14.83)	1.69 (1.34, 5.68)	5.11 (1.29, 8.93)	**	**	**
Hispanic	6.92 (4.08, 9.75)	7.39 (4.97, 9.81)	6.45 (4.01, 8.89)	7.58 (3.85, 11.32)	**	**	**
Asian	2.36 (.00, 4.76)	1.33 (.00, 2.87)	5.54 (.00, 14.53)	3.64 (2.13, 5.14)	**	**	**
American Indian	63.53 (26.46, 153.53)	9.62 (5.55, 24.78)	13.0 (1.62, 22.79)	12.46 (6.69, 17.63)	**	**	**

**
not significant