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Menu Labels, for Better, AND Worse?

Exploring Socio-Economic and Racial-Ethnic Disparities in Menu Label Use in a National Sample

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Abstract

Menu-calorie labeling empowers customers to make healthier food choices. However, does it empower those with greater health literacy more, possibly reinforcing obesity disparities? Using data from the 2007-2008, 2009-2010 and 2013-2014 rounds of the NHANES, we investigate the change in race-ethnic and socio-economic disparities in menu-calorie labeling usage. While menu label usage increased over time, not all groups increased the same. Labels had a greater impact on more empowered groups. Menu-calorie labeling may exacerbate socio-economic and racial-ethnic obesity disparities. Attention should be given to developing improved labels that are more likely to be seen and used by everyone.

Key Words: Menu Label, Obesity, Policy, Disparity

Background

One of the few obesity prevention policies that have received federal government attention is menu calorie labeling. Menu calorie labeling regulations require menus of chain restaurants' to contain details of the energy content of all menu items. The goal of menu calorie labeling is to empower customers to make healthier choices by posting calorie labels in a way that is visible and transparent to customers.[1] Approximately half of total food expenditures are spent outside the home,[2] and frequent eating outside the home has been found to be associated with excess weight gain over time.[3] Without calorie labeling in restaurants, customers have no effective means of estimating the amount of calories in these foods, which tend to be higher in fat, lower in nutritional value, and larger in portion than what individuals would ordinarily consume at home. In 2010, the Patient Protection and Affordable Care Act (ACA) required chain restaurants to post calorie labels, though this requirement is yet to be fully implemented. Many state, county, and local governments have similar mandates prior to the implementation of the ACA mandate. A number of chain restaurants across the country have also adopted labels voluntarily due to customer demand.

In spite of the intuitive appeal of this policy solution, the empirical evidence on the effectiveness of menu labeling on food purchasing behavior is mixed. Harnack and French reviewed several experimental studies of menu labeling, and found menu labeling had the overall effect of reducing calories purchased cafeteria and restaurant settings.[4] However, subsequent systematic reviews of menu labeling found that labeling does not have the intended effect of decreasing calories purchased.[5] Reviews of the evidence on menu calorie labeling have also drawn attention to the ways that menu

calorie labeling may inadvertently reinforce obesity disparities.[6,7] Previous studies have found evidence for disparities in the usage of menu labeling in specific settings.[8] Menu labels were found to reduce the total calories purchased in an upscale chained coffee shop[9], while no significant effect of labeling was found in chained fast food restaurants in New York City among presumably lower-income consumers.[10] In King County, Washington, an early adopter of menu labeling, Chen et al. found that changes in calorie label use varied by race-ethnic status, income level and gender.[11] In a nationally representative cross-sectional sample, Bleich and Wolfson[12] found that people who trying to lose weight are more likely to use the nutrition labels. In addition, they found that individuals with higher educational attainment are more likely to see and use menu labels in fast food restaurants, and Hispanics are less likely to see fast food restaurant labels.

However, previous studies have not looked at whether disparities in label use have changed over time in a nationally representative sample. Researchers are increasingly calling attention to making equity considerations more explicit in the analysis of the evidence-base for different policy options.[6,7] These studies suggest that informational policies, like menu labeling, that are directed towards the general population may paradoxically compound existing social gradients.[13] Higher socio-economic status (SES) groups may have the greater knowledge, prestige, and power to make better use of nutritional information as well as the economic means to potentially spend more on lower calorie items.[14] By contrast, low SES individuals may not be able to make use of labels due to lower overall health literacy[15] or may value calories differently, for instance, preferring the higher calorie option as a means of extracting

more value out of a purchase. One study following the implementation of calorie labeling in New York City found no significant change in the mean calories purchased in a sandwich chain.[16] On the other hand, lower SES groups are more likely to frequent the restaurants under menu labeling mandate, which increases their exposure to the nutritional information, potentially allowing them to benefit more. Presently, the net effect on obesity disparities is unclear.[6,7]

To address this research gap, this study investigates the change in menu labeling use disparities among race/ethnic groups and SES groups, using nationally representative data from 3 rounds of National Health and Nutrition Examination Survey (NHANES) in 2007-2014. This paper incorporates more recent data in the 2013-2014 round, following wider expansion of menu calorie labels since 2010, whereas other recent studies of label use using nationally representative sample have only examined the period prior to 2010 when menu labels were not as widely diffused across the country.[12]

Based on the inverse-equity hypothesis, or the idea that more privileged groups are more likely to be early adopters or health behavior changes,[6] we expect that because of the informational nature of calorie labels, that higher SES groups will be more likely to make use of calorie labels and that disparity in their use will increase over time. On the other hand, because calorie labels are mandated in chain restaurants, which are more likely to be frequented by lower socio-economic groups, it is possible that lower SES groups may benefit disproportionately from at least *seeing* the labels if not making use of them.

Methods

This study uses the 2007-2008, 2009-2010, 2013-2014 rounds of NHANES (2007, 2009 and 2013 hereafter) data to analyze menu calorie label use disparities with a nationally representative sample. In these three rounds, the survey asked the respondents aged 16 years or above about their usage of restaurant menu labels, including whether the respondents saw the menu labels and used the menu labels. This set of questions were asked separately in fast food and sit-down restaurants.

Measures

Dependent Variable: Seeing and Using Calorie Labels. Respondents were first asked if they had seen calorie labels and then, among the subset that reported seeing the labels, whether they had used them. Resondents were asked about their menu calorie usage in regards to two separate settings, fast food and sit-down restaurants. From these questions, we developed two dichotomous measures. We first code individuals in terms of whether or not they saw a menu calorie label last time they visited a restaurant. We then create a dichotomous variable for whether or not they reported using a label that includes the full sample (i.e., both those individuals who reported never seeing labels as well as those who saw the labels and did not use the labels) by coding those who had never seen labels as zero. This provides us with an estimate of the populatin that has used labels. There were 4 dependent variables in total (saw/used in fast-food/sit-down restaurants).

Independent Variables: Race-Ethnic and Socio-Economic Status. We analyzed whether disparities in label use changed using demographic characteristics of respondents.

Race-ethnicity. We analyzed race-ethnic disparities using four groups: White (reference group), Black, Hispanic, and other race (including Asians, Native American/Pacific Islander, multi-racial). We hypothesized that compared with Whites, other race/ethnic groups would be less likely to see and use labels.

Socio-economic status. SES was measured in annual family income and education levels. Income was measured in 5 groups using the middle group, between $35,000 and $64,999, as the reference group. Education was measured in 3 categories using high school graduate or general education diploma as the reference group. We believe that both education and income might have an independent effect on label seeing and using. We hypothesized that individuals with less education would have lower health literacy leading them to be less likely to know how to make use of the labels. Income may also influence calorie choices as lower income individuals may have more of an incentive to get more value in their purchase by purchasing high calorie, low-cost foods. By contrast, high-income earners may be more flexible on budgets to pay more for less energy dense foods. Thus, we test the effects of education and income separately.

Control Variables: Gender, Age and Weight Status. Gender (female dummy), BMI and age (continuous) were included in the statistical analysis as control variables. BMI estimates from NHANES represent results based on biometric data, not self-report[17].

Data Analysis Approach

Bivariate analysis. We first estimate nationally representative estimates of label use for each of the main independent variables. To test whether race/ethnic and SES

disparities changed on the bivariate level, we performed a Wald test. First, we performed logistic regression only using time, race/ethnic or SES, and the interaction terms between them as explanatory variables. Then we use the post estimation command to perform a Wald test of whether the interaction terms are significant.

Multivariate Logistic Regression. Next, we performed multivariate analysis on the date pooled over time to assess the impact each disparity variable (race/ethnicity, income, and education) adjusting for the others and adjusting for gender, age, BMI and year.

Difference-in-Difference Analysis across Time. We make use of the repeat-cross sectional data to examine how disparities in use of labels have changed as the policy has become more widespread through a difference-in-differences approach. To examine the change over time, in our models, we included survey wave both as an independent variable, and as an interaction term with each major disparity variable (race/ethnicity, education, and income). If the interaction terms are significant, this shows that the differences among groups have changed over time.

All results are weighted using the sample weight variable in the body measure dataset[17] and are reported as odds-ratios at the 95% confidence interval.

Limitations

This study cannot test the direct impact of menu labeling laws since the data are based on a national sample and lack of geographic identifiers. Respondents may not have the opportunity to see or use labels in jurisdictions not mandating calorie labeling. The results should be viewed as descriptive and not causal.

Results

Descriptive Statistics and Bivariate-Level Disparities in Menu Label Seeing/Using

Exhibit 1 shows the percentages of respondents that reported seeing and using menu labels. Overall, more people reported seeing and using calorie labels from 2007 to 2013. The percentage of people that reported seeing menu labels increased from 19.7% (2007) to 42.6% (2013) in fast food restaurants and went from 16.2% (2007) to 32.6% (2013) in sit-down restaurant settings. The percentage of people reported using menu labels also increased, from 5.5% (2007) to 15.9% (2013) in fast food restaurants and from 5.8% (2007) to 11.8% (2013) in sit-down restaurants.

Disparities were generally in the hypothesized direction with clear positive income and educational gradients in label seeing and using at each time point (i.e,, wealthier and more educated individuals were more likely to see and use labels). The one exception was that, in some years, a higher proportion of Blacks saw and used labels compared with other groups including Whites. The wald test results at the bivariate level show that each type of disparity significantly increased at least for some form of menu label usage. Each disparity variable showed significant change over time so all were ultimately included in the multivariate regression analysis.

Multivariate Models of Disparities in Menu Label Seeing/Using

Overall Disparities. Exhibit 2 shows disparities in label use pooled over time adjusting for other covariates and the interaction terms between time and disparity type. With regards to race/ethnic disparities in label use, we found that Blacks were more likely to *use* labels in sit-down retaurants compared with Whites (OR = 1.48, $p < 0.01$). Blacks also show a tendency of being more likely to *see* labels in sit-down restaurants, but limited to the 90% significance level. Hispanics were less likely to *see* labels in both

fast food and sit-down restaurants (OR = 0.63 in fast food restaurants, OR = 0.57 in sit-down restaurants; $p < 0.001$ in both), but not less likely to *use* labels compared with Whites. Other/multiracial individuals were also less likely than Whites to *see* (OR = 0.39, $p < 0.001$) and *use* (OR = 0.40, $p < 0.05$) labels in fast food restaurants .

In regards to educational attainment, those with less than a high school education were less likely to *see* labels in either fast food or sit-down outlets (OR = 0.60, $p < 0.001$ and OR = 0.69, $p < 0.01$) and less likely to *use* labels in sit-down restaurants compared with highschool graduates (OR = 0.56, $p < 0.01$). By contrast, college graduates were more likely than high school graduates to both *see* and *use* labels in fast food restaurants (OR = 1.50, $p < 0.001$ and OR = 1.55, $p < 0.05$).

With regards to income levels, compared to the referent group (annual income $35,000 to $64,999), higher income groups (annual income $65,000 to $99,999) were more likely to *see* and *use* menu labels in fastfood restaurants (OR = 1.42 & 1.55, $p < .05$). The highest income group (annual income above $100,000) *used* more menu labels in the sit-down restaurants (OR = 1.59, $p < 0.05$).

In addition to the main effects, the study found that females consistently had a higher likelihood of seeing and using calorie labels in both restaurant settings. Higher age was consistently significantly associated with lower menu label seeing and using. Higher BMI was significantly associated with seeing and using the labels in both fast food and the sit-down restaurants, suggesting people with higher BMI are more concerned with the calories they purchase.

Disparity Changes. Exhibit 3 shows that taking away the general trends, the interaction terms revealed the change in disparities over time. With regards to using calorie labels, label use disparities widened among several groups.

The interaction term between Black and 2013 on using fast food labels had an odds-ratio of 0.62 indicating that the increase of the Black participants' fast food label use was slower, compared to Whites between 2007 and 2013.

The interaction between the college graduate group in the year 2013 was also significant for sit-down restaurant label use, with an odds-ratio of 1.55. This suggests that compared to high school graduates, the likelihood of college graduates using labels in sit-down restaurants increased 1.55 times faster. Individuals with less than high school education showed a tendency of slower increase label use in fast food restaurants, compared to the high school graduates, but this tendency is limited to the 90% confidence level.

Only one interaction term between income and time was significant: the interaction between the lowest income group ($0 – $19,999) and year 2013 in fast food label use, with an odds-ratio of 0.60. Compared to the reference group, this income group increased their use of fast food labels much slower than higher income groups, during the 2007 to 2013 timeframe.

There was no significant change in the disparity in seeing the menu labels on the 95% confidence level. On the 10% level, however, Blacks increased seeing label slower than Whites in 2009 and individuals with less than high school education increased seeing a label in the fast food setting more than high school graduates.

Discussion

This study finds evidence of persistent socioeconomic and race/ethnic disparities in calorie label seeing and using over time. More people have begun seeing and using menu labels as they have become more available over time. In 2013, people were 2.3 to 3.8 times more likely to see or use menu labels compared with 2007. This is likely due to the greater overall availability of labels as districts across the country have adopted calorie labels and many large chain restaurants have begun voluntarily posting calorie counts following industry leaders, for example, McDonald's move of starting to label calorie information in 2012.[18]

However, not all groups are seeing and using labels equally. Contrary to expectation, Blacks were more likely to use menu labels in sit-down restaurants, though not significantly different in their patterns of use from Whites in other settings. Hispanics were less likely to see menu labels in both fast food and sit-down restaurants, though not less likely to use them if they saw them. Other and multi-racial individuals (which includes Asians) were also less likely to see labels in fast food restaurants, but no different than Whites in other categories. Future research can look into why do the Hispanics and other groups *see* menu labels less. This could be due to lack of interest, language barrier or potentially foreign-born individuals being less likely to frequent establishments with mandated calorie labels. By contrast, Blacks were more likely than Whites to report seeing and using labels in sit-down restaurants and fast food to a lesser degree.

Educational attainment affected seeing and using labels. Individuals with a college education were more likely to see and use labels in fast food restaurants and individuals with less than a high school education were consistently less likely than high

school graduates to see and use labels. This finding suggests that health literacy may be a barrier to label use. Individuals with lower educational attainment may be less likely to know daily calorie recommendations and individuals who are less numerate may have a harder time converting calorie counts into a percent of daily value in their heads. Research has shown that without prompting about what a typical male and female calorie intake per day should look like, individuals may not be able to interpret how large a portion of total calories different offerings represent.[19] This issue is likely compounded by low overall numeracy among those with low educational attainment.[15]

Income affected seeing and using labels as well though less consistently than for education. Compared with households in the middle of the income distribution, households with annual income between $65,000 and $99,999 were more likely to both see and use menu labels in fast food restaurants, though not in sit-down restaurants. However, those households with annual income above $100,000 were no more likely than middle income groups to see or use labels except in sit-down restuarants where they had a higher odds of using labels. It could be that the highest income groups do not tend to frequent chain restaurants that include calorie labels on menus, but when they do, they are more likely to use them if they see them. Though not significant, lower income groups tended to be less likely to see and use labels in a manner consistent with expectation. Overall, the social gradient in seeing and using labels was as expected with lower SES individuals being less likely to see and use labels compared with higher SES groups.

Previous studies have suggested that females, people who are younger, and individuals with higher BMI are more likely to see and use menu labels. Consistent

with previous literature, we found that being female, younger age and higher BMI are associated with more menu label seeing and using. [12]

In addition to finding evidence of disparities, the study also found that despite the general trend of increase in seeing and using menu labels, disparities in use have widened over time. Specifically, by 2013 Blacks and those in the lowest income group had increased menu-labeling usage less than their respective reference groups in fast food restaurants. By 2013, college graduates increased menu label usage in sit-down restaurants more than high school graduates. The deepening of disparities seems to have accelerated with the expansion of menu calorie labeling to more venues over time: all three significant interactions in the 95% confidence level were with the year 2013, whereas the disparity change was significant at the 90% confidence level between 2007 and 2009, when the health eating campaigns had not been widely carried out and the policy had not been broadly diffused.

These findings lend support to the inverse-equity argument that education level may impact nutritional literacy, leading informational campaigns to reinforce disparities due to the need for preexisting knowledge to make use of these interventions. As the use of the menu labels requires a certain amount of nutritional literacy, people with higher education levels may have been more ready to take advantage of the labels.

Policy makers should consider the possibility that the menu labeling mandate as a policy may increase disparities in label use even as more people are using labels overall. The menu labeling policy appears to empower people with more existing knowledge to make healthier and more informed choices, who may have already been seeking nutrition information. Furthermore, the increase in label use has been much

slower than the label seeing, suggesting that besides posting the calorie numbers, more effort is needed in order to achieve the goal of successfully nudging people to make healthier food choices. More attention should be given to developing improved labels that are more likely to be seen and used by everyone, for instance by reporting calories of products as a percent of daily value rather than an absolute calorie count. Promising experiments have shown that "traffic light" food labeling systems that identify foods as red (unhealthy), yellow (less healthy), or green (healthy) can assist individuals in making healthier choices when selecting foods.[19, 20] Though research has not examined explicitly the effect of simplified food choice labels on disparities in healthy food purchasing, it is likely that a color-coded system that easily translates nutritional values for consumers may prompt individuals who are less health-literate to look at and effectively utilize food labels.

Conclusion

The results of this study reinforce concerns of health policy scholars that menu calorie labeling may further entrench socio-economic and racial-ethnic obesity disparities. As current federal labeling legislation is yet to be implemented, a consideration of how to improve calorie labels so that they are used more evenly by a broader subset of the population should be contemplated.

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EXHIBIT 1 (table)
Caption: Summary Statistics: Weighted Points Estimates and Binary Wald Test Results
Source [Authors' analysis of data from 2007- 14 rounds of the National Health and Nutrition Examination Survey (NHANES)]
Notes [Results weighted to be nationally representative, same below.
Significance level: *p<0.10 p<0.05 p<0.01 ****p<0.001.]

EXHIBIT 2 (table)
Caption: Disparities by Menu Label Use Type and Restaurant Setting
Source [Authors' analysis of data from 2007- 14 rounds of the NHANES]
Notes [Significance level: *p < 0.10 **p < 0.05 ***p < 0.01 ****p < 0.001. Reference groups omitted.]

EXHIBIT 3 (table)
Caption: Disparities Change by Menu Label Use Type and Restaurant Setting
Source [Authors' analysis of data from 2007- 14 rounds of the NHANES]
Notes [Significance level: *p < 0.10 **p < 0.05 ***p < 0.01 ****p < 0.001. Reference groups omitted.]

EXHIBIT 1 Summary Statistics: Weighted Points Estimates and Binary Wald Test Results

		% in Total	Fast Food % Saw Labels			Sit-Down % Saw Labels			Fast Food % Used Labels			Sit-Down % Used Labels		
			2007	2009	2013	2007	2009	2013	2007	2009	2013	2007	2009	2013
Total		100	19.7	22.9	42.6	16.2	17.1	32.6	5.5	7.1	15.9	5.8	6.5	11.8
Race/ Ethnic	White	67.0	21.0	24.3	45.6	16.3	17.4	33.5	5.7	7.4	18.0	5.8	6.7	12.2
	Black	11.6	19.8	23.3	40.5	22.2	21.5	40.4	6.6	7.8	11.7	7.7	6.9	12.6
	Hispanic	14.3	14.4	16.9	33.7	10.8	13.3	26.3	4.9	5.5	11.8	4.6	5.1	10.7
	Other	7.1	12.0	18.2	36.5	15.6	14.5	25.5	2.3	6.0	12.5	4.1	6.9	9.8
Wald Test Chi-Square				2.8			3.9			**20.4*** **			5.4	
Education	Less than High School	21.6	13.6	21.3	28.1	13.5	15.0	26.3	3.9	5.1	6.6	3.4	4.8	5.7
	High School Graduate	52.5	19.9	22.1	41.9	16.7	18.2	33.8	5.3	7.0	14.1	6.2	6.0	11.0
	College Graduate	25.9	24.1	25.4	52.7	17.2	16.3	33.6	7.5	9.2	25.3	7.2	8.9	17.6
Wald Test Chi-Square				**26.4**** **			2.3			**21.0**** **			**9.5****	
Income	<$20K	18.0	18.8	19.7	34.1	16.0	15.4	27.4	5.4	5.9	8.7	4.4	4.5	7.0
	$20K-$35K	20.7	16.3	23.0	39.1	14.0	15.9	31.1	4.0	6.4	12.5	5.7	5.4	11.1
	$35K-$65K	23.7	18.7	20.3	41.6	14.7	18.1	34.2	4.8	6.4	14.0	4.7	7.1	11.6
	$65K-$100K	16.3	24.4	25.5	47.6	17.6	18.7	34.4	8.1	9.2	21.5	6.1	8.0	12.9
	>$100K	21.3	21.0	25.5	49.4	18.6	16.9	33.9	5.7	8.2	22.5	7.8	7.5	15.3
Wald Test Chi-Square				11.1			5.1			**20.8*** **			5.7	

Source: Authors' analysis of data from 2007- 14 rounds of the National Health and Nutrition Examination Survey (NHANES)
Results weighted to be nationally representative, same below.
Significance level: *p<0.10 p<0.05 p<0.01 ****p<0.001.

Exhibit 2. Disparities by Menu Label Use Type and Restaurant Setting

		See		Use	
		Fast Food	Sit-Down	Fast Food	Sit-Down
Race/Ethnic (Reference: White)	Black	0.91 [0.74,1.14]	**1.24*** **[0.99,1.56]**	1.19 [0.87,1.62]	**1.48***** **[1.10,1.98]**
	Hispanic	**0.63****** **[0.51,0.80]**	**0.57****** **[0.44,0.74]**	1.02 [0.75,1.40]	1 [0.73,1.37]
	Other	**0.39***** **[0.22,0.71]**	0.73 [0.43,1.24]	**0.40**** **[0.19,0.86]**	0.71 [0.33,1.51]
Education (Reference: High School Graduate)	Less than High School	**0.60****** **[0.46,0.77]**	**0.69***** **[0.52,0.91]**	0.75 [0.53,1.07]	**0.56***** **[0.39,0.79]**
	College Graduate	**1.50****** **[1.18,1.91]**	1.19 [0.91,1.57]	**1.55**** **[1.09,2.20]**	1.14 [0.80,1.64]
Income (Reference: $35,000-$64,999)	$0-$19,999	0.92 [0.69,1.22]	0.78 [0.57,1.07]	1.13 [0.76,1.68]	0.87 [0.57,1.33]
	$20,000-$34,999	0.89 [0.67,1.20]	0.92 [0.68,1.26]	0.85 [0.55,1.30]	1.24 [0.83,1.85]
	$65,000-$99,999	**1.42**** **[1.06,1.90]**	1.27 [0.92,1.75]	**1.55**** **[1.01,2.36]**	1.19 [0.77,1.85]
	$100,000 and above	1.01 [0.74,1.38]	1.23 [0.88,1.73]	1.06 [0.66,1.69]	**1.59**** **[1.03,2.48]**
Year (Reference: 2007)	Year 2009	1.2 [0.89,1.61]	**1.33*** **[0.96,1.84]**	1.36 [0.87,2.11]	1.29 [0.82,2.02]
	Year 2013	**3.79****** **[2.88,5.00]**	**3.57****** **[2.68,4.76]**	**3.31****** **[2.23,4.91]**	**2.28****** **[1.52,3.41]**
Female		1.12** [1.02,1.23]	1.34**** [1.21,1.49]	1.67**** [1.46,1.91]	1.96**** [1.69,2.26]
Age		0.99**** [0.98,0.99]	0.99**** [0.99,0.99]	0.99**** [0.99,1.00]	1.00* [0.99,1.00]
BMI		1.02**** [1.01,1.03]	1.01**** [1.01,1.02]	1.01*** [1.01,1.02]	1.01** [1.00,1.02]
Interactions		X	X	X	X
Constant		0.17**** [0.12,0.23]	0.11**** [0.08,0.16]	0.03**** [0.02,0.05]	0.03**** [0.02,0.05]
Pseudo R-Square		0.09	0.07	0.08	0.05

Number of Observations	19,015	19,015	19,015	19,015

Source: Authors' analysis of data from 2007- 14 rounds of the NHANES
Significance level: *p < 0.10 **p < 0.05 ***p < 0.01 ****p < 0.001. Reference groups omitted.

Exhibit 3. Disparities Change by Menu Label Use Type and Restaurant Setting

		See		Use	
		Fast Food	Sit-Down	Fast Food	Sit-Down
Time # Race/ Ethnic	2009 # Black	0.86	**0.73***	0.93	0.78
		[0.64,1.16]	**[0.53,1.01]**	[0.61,1.41]	[0.51,1.19]
	2009 # Hispanic	0.91	1.08	0.83	0.94
		[0.67,1.23]	[0.76,1.54]	[0.54,1.28]	[0.61,1.45]
	2009 # Other	1.38	0.85	1.92	1.41
		[0.68,2.79]	[0.43,1.69]	[0.76,4.85]	[0.57,3.51]
	2013 # Black	0.96	0.94	**0.62****	0.84
		[0.74,1.26]	[0.71,1.25]	**[0.42,0.91]**	[0.58,1.23]
	2013 # Hispanic	1.08	1.23	0.86	1.2
		[0.81,1.42]	[0.89,1.69]	[0.59,1.27]	[0.80,1.80]
	2013 # Other	1.51	0.86	1.53	1.05
		[0.81,2.81]	[0.48,1.53]	[0.67,3.48]	[0.47,2.36]
Time # Education	2009 # Less than HS	**1.39***	0.99	1.03	1.49
		[1.00,1.95]	[0.68,1.43]	[0.64,1.66]	[0.92,2.41]
	2009 # College	0.84	0.86	0.85	1.27
		[0.61,1.16]	[0.60,1.25]	[0.54,1.35]	[0.79,2.05]
	2013 # Less than HS	0.87	0.91	**0.64***	0.92
		[0.64,1.19]	[0.65,1.28]	**[0.40,1.00]**	[0.57,1.48]
	2013 # College	0.94	0.9	1.2	**1.55****
		[0.70,1.26]	[0.64,1.25]	[0.79,1.81]	**[1.01,2.38]**
Time # Income	2009 # $0-$20K	0.9	0.85	0.85	0.74
		[0.62,1.32]	[0.55,1.30]	[0.50,1.45]	[0.42,1.32]
	2009 # $20K-$35K	1.17	0.85	1.21	**0.63***
		[0.80,1.71]	[0.56,1.29]	[0.70,2.12]	**[0.36,1.08]**
	2009 # $65K-$100K	0.92	0.88	0.91	0.92
		[0.62,1.38]	[0.56,1.37]	[0.51,1.62]	[0.51,1.67]
	2009 # $100K and above	1.17	0.82	1.15	0.62
		[0.78,1.77]	[0.52,1.29]	[0.63,2.12]	[0.34,1.12]
	2013 # $0-$20K	0.8	0.77	**0.60****	0.68
		[0.57,1.14]	[0.52,1.13]	**[0.36,0.98]**	[0.40,1.17]
	2013 # $20K-$35K	1.08	0.93	1.13	0.79
		[0.76,1.54]	[0.64,1.36]	[0.68,1.89]	[0.48,1.30]
	2013 # $65K-$100K	0.89	0.92	0.98	0.85
		[0.61,1.29]	[0.61,1.37]	[0.58,1.64]	[0.49,1.46]
	2013 # $100K and above	1.2	0.9	1.3	0.69

	[0.82,1.75]	[0.60,1.35]	[0.76,2.23]	[0.40,1.16]
Time, Disparity and Control Variables	X	X	X	X
Constant	0.17****	0.11****	0.03****	0.03****
Pseudo R-Square	0.09	0.07	0.08	0.05
Number of Observations	19,015	19,015	19,015	19,015

Source: Authors' analysis of data from 2007- 14 rounds of the NHANES
Significance level: *p < 0.10 **p < 0.05 ***p < 0.01 ****p < 0.001. Reference groups omitted.