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Variations in Hypertension-Related Outcomes Among Blacks, Whites and Hispanics in Two Large Urban Areas and in the United States

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Abstract

Objective—This study compared the hypertension prevalence, awareness, treatment and control in Chicago, Illinois and Detroit, Michigan to that of the general United States population (aged ≥ 25 years) for the period 2001–2003. We examined whether and how much 1) urban populations have less favorable hypertension-related outcomes and 2) the rates of racial/ethnic minorities lag behind those of Whites in order to determine if the national data understate the magnitude of hypertension-related outcomes and racial/ethnic disparities in two large cities in the Midwestern region of the United States and perhaps others.

Methods—Unstandardized and standardized hypertension-related outcome rates were estimated.

Results—The hypertension-related outcomes among Chicago and Detroit residents lag behind the United States by 8%–14% and 10%–18% points, respectively. Additionally, this study highlights the complexity of the racial/ethnic differences in hypertension-related outcomes, where *within* each population, Blacks were more likely to have hypertension and to be aware of their hypertension status than Whites, and no less likely to be treated. Conversely, Hispanics were less likely to have hypertension and also less likely to be aware of their status when they do have hypertension when compared to Whites.

Conclusion—At a time when efficacious treatment for hypertension has been available for more than 50 years, continued racial/ethnic differences in the prevalence, awareness, treatment and control of hypertension is among public health's greatest challenges. To achieve the proposed national hypertension-related goals, future policies must consider the social context of hypertension within central cities of urban areas. (*Ethn Dis*. 2012;22[4]:391–397)

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Keywords

Hypertension; Minority Health; Population; Urban Health

Introduction

Hypertension is a major risk factor for cardiovascular disease, the leading cause of death in the United States.[1] At a time when efficacious treatment regimens for hypertension have been available for more than 50 years,[1] continued racial/ethnic differences in the prevalence, awareness, treatment and control of hypertension (hereafter referred to as hypertension-related outcomes), is among public health's greatest challenges. While substantial improvements were made in hypertension prevalence rates for the overall population between 1960 to 1980, recent analyses show that these gains have been reversed.[2–5] However, what is more troubling in light of the increasing hypertension prevalence rates in the United States is that even though some progress has been made with regard to increasing the rates of awareness, treatment and control of hypertension among the general US population, the rates of increase are not uniform among all racial/ethnic groups and are suboptimal.[4–6] For example, analysis of the data of the National Health and Nutrition Examination Survey (NHANES) 1999–2002 showed that the hypertension prevalence rate among Blacks, the group with the highest prevalence, was 47.3% higher than Whites (41.4% vs 28.1%), while the awareness rates were actually 10.4% higher than that of Whites (77.7% vs 70.4%) and treatment rates were 12.9% higher than Whites (68.2% vs 60.4%). Additionally, the control rate among those treated was 18.1% (48.9% vs 59.7%) lower than those of Whites.[6] Mexican Americans had some favorable hypertension-related outcomes, with a prevalence rate of hypertension in 1999–2000 that was 44.5% lower than Blacks (18.1% vs 32.6%).[7] At the same time, compared to Blacks, Mexican Americans had awareness of hypertension rates that were 23.6% lower (57.7% for Mexican Americans vs 75.5% Blacks), treatment rates that were 36.3% lower (39.7% for Mexican Americans and 62.3% for Blacks), and control rates that were 37.6% lower (17.6% for Mexican Americans and 28.2% for Blacks).[7]

To achieve the *Healthy People 2020* goals of 16% prevalence rate and 50% control rate for all racial/ethnic groups,[8] we need a better understanding of the determinants of these observed differences. One major area of focus is residents of large urban areas where Blacks and Mexican Americans are over-represented.[9,10] Although national studies have provided a clear picture of group differences in the hypertension-related outcomes across states, there is little evidence from population-based studies of hypertension-related outcomes within large cities, outside of the southeastern Stroke Belt region. As such, the goal of this study was to determine if the current national trends are also present in two similar but distinct urban areas in the Midwestern region of the United States. We examined hypertension-related outcomes by race/ethnicity using data from Chicago, Illinois and Detroit, Michigan. Findings from these cities are compared with a similarly aged subsample of NHANES 2001–2002, a population-based sample representative of the United States, in order to determine whether and how much 1) urban populations as a whole have more favorable hypertension-related outcomes and 2) the rates of racial/ethnic minorities lag behind Whites.

Methods

Data

The data used to understand the hypertension-related outcomes in Chicago, Illinois is from the Chicago Community Adult Health Study (CCAHS).[11] The CCAHS, conducted during 2001–2003, is a stratified, multistage probability sample of 3,105 adults aged ≥18 years.[11]

The sample includes 802 Hispanics, 1240 non-Hispanic Blacks (hereafter referred to as Blacks), 983 non-Hispanic Whites (hereafter referred to as Whites), and 80 individuals of other races/ethnicities. To be consistent with the age structure of the Detroit sample, for this study, the analytic sample was limited to respondents who were aged ≥25 years (n=2,497). The weighted sample matches the distribution of the 2000 Census population estimates for the city of Chicago in age, race/ethnicity and sex.

The data used to understand the hypertension-related outcomes in Detroit, Michigan came from the Healthy Environment Project (HEP), a study of adults, aged ≥25 years (N=919) conducted during 2002–2003. Sample weights were constructed to adjust for differential selection and response rates, allowing the estimation of population effects from the HEP sample of Detroit.[12]

For comparison purposes between the two cities and the larger US population, we used NHANES 2001–2002 public-use dataset, limited to respondents aged ≥25 years (n=4,497) (hereafter referred to as NHANES). This 2001–2002 NHANES data served as the best possible option given the data collection period of the CCAHS and HEP studies. CCAHS and HEP were approved by the appropriate institutional review boards. All of the participants provided informed consent.

Hypertension-related Outcomes

Resting systolic (SBP) and diastolic (DBP) blood pressure measurements were taken in the NHANES, CCAHS and HEP studies on three separate occasions by trained staff members. The multiple measures of SBP and DBP from the studies were averaged to be used in this study; in HEP, the mean of the second and third measurements was used, while all three were used in the other two studies. We defined hypertension as SBP ≥140 mm Hg, DBP ≥90 mm Hg, or self-report of antihypertensive medication use in the last 12 months.[13] Those hypertensive study participants were further classified into subgroups based on awareness given measured hypertension, treatment given awareness, control given treatment, and control among all hypertensives. Awareness of hypertension was defined as a "yes" response to the survey question "Has a doctor or health professional ever told you that you have high blood pressure or hypertension?" Treatment of hypertension was defined as a "yes" response to the survey question asking about taking antihypertensive medications in the last 12 months. Overall, the control of hypertension was defined as a BP measurement of < 140/90 mm Hg, for those with hypertension who were being treated as well as those not treated.

We also examined several sociodemographic and risk factor variables that could potentially confound the relationship between race/ethnicity and the hypertension-related outcomes. The sociodemographic variables we included were sex, age (25–39, 40–59 and ≥60), educational attainment (<12 years, 12 years and ≥13 years) and annual household income (< $10,000; $10,000–$19,999; $20,000–$29,999 and ≥$30,000). The risk factor variable examined was body mass index (categorized as underweight or normal [<24.9 kg/m^2], overweight [25–29.9 kg/m^2], and obese [≥30.0 kg/m^2]).

Statistical Analyses

The participants' characteristics for all three populations were summarized using percentages (Table 1). The weighted distributions of the hypertension-related outcomes are presented in Table 2. To compensate for the variation in the distribution of the sociodemographic characteristics associated with hypertension and race/ethnicity between the three populations, we standardized all of our bivariate analyses by the age, sex, education and income distribution of the US population using the March 2002 Current

Population Survey Annual Demographic File(CPS) as our standard population (Table 3). The standardized estimator is given by $\widehat{P}=\Sigma_i \pi_i \widehat{P}_i$, where $\widehat{P}_i$ is the predicted probability of having hypertension from a logistic regression in each sample of hypertension on the dummy variables of sex and age and education and income categories, i indexes the unique cells defined by age, sex, education, and income, and π_i is the proportion of the US population in a given cell obtained from the CPS.[14] The standard error of each case is shown in parentheses. Multiple logistic regression analyses predicting hypertension prevalence, awareness, treatment and control adjusting for the potential confounders were also conducted to investigate racial/ethnic differences in these outcomes (Table 4). All of the analyses within each sample were weighted using the prescribed weights that compensated for the complex multistage sampling design, oversampling and response rate from each of the data sources, making the data representative of the populations of Chicago, Detroit, and the US respectively. To account for weighting as well as the clustering of subjects, robust (sandwich-type) estimators of variance were employed. All of the analyses were conducted using SAS v9.2.

Results

The composition of the three samples was very similar with regards to sex and age. The weighted CCAHS sample (Chicago) consisted of 24% Hispanic (16% Mexican), 40.5% White and 32% Black. The weighted HEP (Detroit) sample was 22.2% Hispanic (19.0% Mexican), 18.8% White and 56.8% Black. However, the NHANES 2001–2002 sample was 11.8% Hispanic (6.2% Mexican), 74% White and 10% Black. A significant portion of the Detroit samples can be characterized as disadvantaged when compared to the Chicago and NHANES 2001–2002 samples, where almost 37.3% of the Detroit sample reported less than 12 years of education (18.4% for NHANES and 24% for Chicago) and more than half (53.3%) of the Detroit sample reported their household income as less than $20,000 (15.5% for NHANES and 21.6% for Chicago). In terms of BMI, all three of the samples were relatively similar with the exception of the obese category (BMI>30kg/m^2) being considerably larger in the Detroit sample. In the Chicago and NHANES sample, less than 30% of the weighted sample was obese, however, approximately 47.7% of the Detroit sample was obese.

The weighted, unstandardized estimates of hypertension prevalence, awareness and treatment control of the three samples are presented in Table 2. Hypertension-related outcomes were more favorable in the NHANES national sample compared to the Chicago and Detroit samples. The prevalence rate of hypertension was lowest in the general US population, while hypertension awareness, treatment and control rates (among those treated and all hypertensives) were higher compared to residents of Chicago and Detroit. Specifically, hypertension prevalence among all racial/ethnic groups combined was at least five percentage points higher in Chicago and Detroit (38.5% and 42.2%, respectively), compared to the US (32.1%), and rates of awareness, treatment and control were between five and 16 percentage points lower in Chicago and Detroit when compared to the general US population. A similar pattern was also evident when considering the different hypertension-related outcomes by race/ethnicity between the three geographic areas of interest. Overall, Black, Hispanic and White residents of Chicago and Detroit had less favorable rates of hypertension prevalence, awareness, treatment and control (except for hypertension control rates among Mexicans and Blacks in Detroit who were treated for hypertension) compared to their US counterparts. Most striking is the comparison of the different racial/ethnic groups in Detroit and their US counterparts. Mexicans in Detroit had about twice the prevalence of hypertension as Mexicans nationally (37.2% vs 19.7%, respectively). Although the difference in hypertension prevalence between Blacks in Detroit and the United States was less than two percentage points, Detroit Blacks had a markedly

lower level of treatment than their national counterparts (53.7% vs 71.9%, respectively). Whites in Detroit, on the other hand, had higher prevalence of hypertension and lower awareness, treatment, and control than Whites nationally.

What if Detroit, Chicago and the United State had the same population distribution of age, sex, education and income, known demographic characteristics associated with hypertension? Table 3 presents the standardized hypertension-related outcomes using the 2002 CPS as our standard population. Many of the key overall patterns observed in the unstandardized analyses remained similar after controlling for the differences in the population demographics. For example, residents in both Chicago and Detroit experienced less favorable rates of hypertension prevalence, awareness, treatment and control compared to residents in the general US population. Hispanics tend to have the lowest hypertension prevalence rates but also the lowest awareness and treatment rates. However, there were some noteworthy differences when comparing the standardized and unstandardized estimations of hypertension control among those treated for hypertension. For example, the weighted but unstandardized hypertension control rate showed that 54.6% of all hypertensives in Detroit taking medication controlled their hypertension compared to 57.7% of the general US population (Table 2). However, after standardizing the two populations, the control rate among those treated was 46.3% in Detroit and 63.8% in the general US population. In other words, if Detroit had the same distribution of residents by age, sex, income and education as the US, the hypertension control rate among those treated for hypertension would be approximately 18 percentage points lower in Detroit (Table 3). A similar pattern was evident for hypertension treatment among Whites in Detroit. After standardizing for the difference in the population distribution, the difference in hypertension treatment among Whites in Detroit was approximately 30 percentage points lower than Whites in the general US population (Table 3).

Results from multivariable logistic regression analyses predicting racial/ethnic differences (with Whites as the reference group) in the hypertension-related outcomes within each geographic region of interest are presented in Table 4. Although not statistically significant ($P<.05$) in all instances, the results suggest that non-Hispanic Blacks were more likely to have, be aware of, and be treated for hypertension but were less likely to control their hypertension than Whites across all three of the samples. Similarly, Mexicans were less likely to have hypertension but also less likely to be aware and control their hypertension in the United States and Chicago. Although the odds ratios for Mexicans in Detroit suggest a similar pattern for hypertension control, the sample size rendered the coefficients and associated standard errors unstable in the statistical analyses, and thus they are not reported. Intriguing patterns of variation were also evident. Black hypertensives in Detroit were two and a half times more likely than their White peers to be treated, and equally or more likely to be controlled; but no statistically significant racial/ethnic differences in treatment were evident in Chicago or nationally, where Blacks are less likely to be controlled (significantly so in the NHANES data). Thus efforts to increase awareness and treatment among Blacks (relative to other groups) appear to have been more successful within Detroit than within Chicago or the nation as a whole, resulting in levels of control in Detroit that are comparable for Blacks and Whites. This greater racial equality within Detroit must, however, be seen in the context of the much lower rates of control of hypertension among both Blacks and Whites in Detroit (and Chicago) compared to national levels (Table 3).

Discussion

Two sets of important findings are evident in this study. First, the results suggest that the national rates of hypertension prevalence, awareness, treatment and control mask variations across areas, here the central cities of urban areas such as Detroit and Chicago, two large

Midwestern cities with relatively high proportions of non-Whites, compared to the rest of the nation. The results suggest that the central cities of these urban areas perform much worse than the United States as a whole. Specifically, results from this study suggest that residents from Chicago and Detroit consistently have less favorable rates of hypertension-related outcomes when compared to the United States as a whole. For example, the prevalence, awareness and treatment rates of hypertension among Chicago residents lag behind that of the general US population by 5%–10% points in the weighted analyses (Table 2); however, after accounting for the variation in age-sex-education-income distribution the hypertension-related outcomes in Chicago lag behind the general US population by 10%–14% (Table 3). And, the outcomes in Detroit, an even more politically chaotic and economically disadvantaged city, are worse than those in Chicago. This overall patterning after standardizing for age, sex, income and education suggests that most of the variation across these geographic regions and racial/ethnic subgroups is not explained by the age-sex-education-income composition of the populations, as this variation tends to increase after such standardization (cf Table 3 vs Table 2).

The second noteworthy finding highlighted by this study is the complexity of the racial/ethnic differences in hypertension-related outcomes within the populations we examined. After controlling for sociodemographic variables of interest and BMI, the racial/ethnic patterning was similar across the areas we examined. For example, within all three populations, Blacks were more likely to have hypertension and also more likely to be aware of their hypertension status than Whites, though the differences for awareness were smaller and not quite significant in Detroit and Chicago. Paradoxically, despite being more aware of, and treated for, their hypertension status, Blacks also tend to have lower control rates than Whites in Chicago. On the other hand, Mexicans were less likely to have hypertension and also less likely to be aware of their status when they do have hypertension. Although not directly examined in this study, the relatively high awareness and treatment rates suggest that Blacks have benefited from large scale efforts such as public health campaigns and increased access to health care services through financing programs such as Medicaid and Federally Qualified Health Centers. Even so, they still lag behind Whites with respect to overall prevalence and control of hypertension, and continued efforts are needed to achieve more favorable hypertension prevalence and control rates for Blacks and Hispanics.

It is clear that the *Healthy People 2010* goals of achieving a national hypertension prevalence rate of 16% and a 50% hypertension control rate were not realized. To achieve this national goal, as also adopted for the *Healthy People 2020* plan,[8] we must continue to critically seek a better understanding of these observed differences. More troubling is the fact that the national prevalence rates seem to be increasing after the gains made during 1960–1980 in the general US population. One major area of focus to understand the differences in hypertension-related outcomes should be residents of large urban areas, which are over-whelmingly inhabited by Blacks and Mexican Americans.[9,10,15–17] Recent analyses of data of the southeastern United States, a region widely known for disproportionately higher rates of hypertension, has shown that higher rates of hypertension awareness, treatment and control can be achieved given an appropriate amount of investment in the public health and health care systems.[18,19] The long-lasting public health efforts to ameliorate the higher-than-average stroke mortality rates experienced by residents in the southeastern Stroke Belt suggests that targeted policies may be successful in achieving more favorable rates of hypertension management if not the prevalence of hypertension.[18] The central cities of large urban areas may need similarly focused attention, and the ambient stressors in these environments, to which racial/ethnic “minorities” are disproportionately exposed, may pose even larger barriers to reducing prevalence and improving hypertension control than the more often rural environments of minorities in the Stroke Belt.[20]

The conclusions drawn from this study are limited by the fact that we examined data from the central cities of just two large urban areas. Additional analyses stratifying the hypertension-related outcomes between large urban areas vs non-urban areas are needed to further elucidate these patterns. However, the public-use NHANES dataset prohibits analysis that enable a better understanding as to whether results for Chicago and Detroit are unique to those cities, or representative of the central cities of all or some larger subset of US standard metropolitan statistical areas.

Nonetheless, the results from this study suggest that the national rates of hypertension-related outcomes are not reflective of large urban areas, or at least Chicago and Detroit, the focus of this study. Secondly, the results also high-light the complexity of the racial/ethnic differences in hypertension-related outcomes. To achieve the *Healthy People 2020* hypertension prevalence goal (16%), the current national prevalence rate must be decreased in half. Although recent analyses do suggest that the hypertension control rate may have been attained for the United States as a whole,[4,5] the following question remains: is the hypertension control rate of the general US population reflective of the experience of large urban areas? Future research and policies must focus on how distal factors[21] such as racial/ethnic residential segregation, low socioeconomic status, racial/ethnic related stressors and poor quality medical care are related to the observed differences (both across urban cities vs the United States and between racial/ethnic groups) in hypertension-related outcomes.

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The goal of this study was to determine if the current national trends are also present in two similar but distinct urban areas in the Midwestern region of the United States.

The results suggest that the central cities of these urban areas perform much worse than the United States as a whole.

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Table 1

Weighted characteristics of the Chicago, Detroit and the US[a] samples, %

	Chicago (*N*=2,497)	Detroit (*N*=919)	US[a] (*N*=4,279)
Race/ethnicity			
Other Hispanic[b]	8.6	3.2	5.6
Mexican	15.5	19.0	6.2
NH White	40.5	18.8	74.0
NH Black	31.9	56.8	10.0
NH Other	3.5	2.3	4.2
Age, in years			
25–39	41.6	37.1	33.5
40–59	37.4	43.3	43.6
60+	21.1	19.5	23.0
Sex			
Female	51.8	52.3	51.6
BMI			
<25.0 kg/m^2	28.6	21.4	31.4
25.0–29.9 kg/m^2	36.3	30.9	34.9
≥30.0 kg/m^2	25.2	47.7	29.4
Missing	NA	NA	4.3
Education, in years			
<12 yrs	24.1	37.3	18.4
12 yrs	21.5	29.5	25.2
≥12 yrs	54.4	33.2	56.3
Missing	NA	NA	.1
Household income			
$0–9,999	9.0	27.3	4.8
$10,000–19,999	12.6	26.0	10.7
$20,000–29,000	15.6	23.6	15.8
≥$30,000	44.2	23.0	60.8
Missing	18.6	NA	7.8

NH, Non-Hispanic; BMI, body mass index; NA, not applicable; US, United States.

[a]Based on NHANES 2001–2002 sample (≥25 years old).

[b]Refers to Hispanics other than Mexicans.

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Table 2

Weighted prevalence, awareness, treatment, and control of hypertension by sample[a]

	Chicago	Detroit	US[a]	Chicago	Detroit	US[a]
	Prevalence % (SE)			Awareness % (SE)		
All	38.5 (1.3)	42.2 (.3)	32.1 (1.3)	67.2 (2.1)	59.9 (.4)	72.3 (1.6)
All Hispanic	31.0 (2.0)	35.8 (.5)	22.3 (1.8)	59.7 (4.4)	52.9 (.9)	60.1 (3.7)
Mexican	29.1 (2.5)	37.2 (.6)	19.7 (1.5)	55.2 (6.0)	57.5 (1.0)	57.0 (4.1)
NH White	34.0 (2.3)	42.4 (.5)	32.5 (1.3)	62.4 (4.0)	59.5 (.8)	72.7 (1.8)
NH Black	50.8 (2.0)	45.0 (.3)	43.4 (3.5)	75.5 (2.5)	62.3 (.5)	78.6 (1.8)
	Treatment % (SE)			Control Among Treated % (SE)		
All	56.5 (2.3)	50.3 (.4)	66.8 (1.6)	44.4 (2.5)	54.6 (.5)	57.7 (.7)
All Hispanic	48.9 (4.3)	43.8 (.9)	54.7 (4.1)	40.0 (6.2)	69.6 (1.2)	58.3 (5.2)
Mexican	44.4 (5.7)	46.6 (1.0)	50.3 (3.4)	31.4 (8.4)	74.6 (1.3)	57.2 (3.9)
NH White	52.5 (4.4)	48.8 (.8)	67.1 (1.7)	49.4 (4.5)	54.4 (1.1)	59.8 (1.1)
NH Black	63.6 (3.0)	53.7 (.5)	71.9 (1.6)	40.9 (3.4)	53.2 (.6)	48.6 (1.3)
	Control Among Hypertensive % (SE)					
All	25.1 (1.8)	27.4 (.3)	38.5 (1.1)			
All Hispanic	19.5 (3.4)	30.5 (.8)	31.9 (3.7)			
Mexican	14.0 (3.8)	34.8 (1.0)	28.8 (2.8)			
NH White	25.9 (3.4)	26.5 (.7)	40.1 (1.2)			
NH Black	26.0 (2.3)	28.6 (.4)	35.0 (1.5)			

NH, Non-Hispanic; BMI, body mass index; SE, standard error; US, United States.

[a]Based on NHANES 2001–2002 sample (≥25 years old).

Table 3

Weighted and standardized[a] prevalence, awareness, treatment, and control rates of hypertension by sample[b,d]

	Chicago	Detroit	US[c]	Chicago	Detroit	US[c]
	Prevalence % (SE)			Awareness % (SE)		
All	41.2 (.02)	43.0 (.05)	33.4 (.02)	61.8 (.06)	53.7 (.33)	68.2 (.05)
All Hispanic	33.0 (.04)	25.6 (.06)	22.6 (.02)	58.1 (.26)	52.1 (1.50)	46.4 (.15)
Mexican	33.2 (.06)	27.0 (.09)	20.7 (.03)	50.3 (.27)	51.9 (.97)	47.7 (.18)
NH White	37.8 (.06)	35.3 (.25)	33.8 (.01)	57.2 (.17)	41.5 (.47)	69.5 (.09)
NH Black	47.7 (.03)	44.4 (.06)	42.8 (.03)	69.4 (.11)	51.1 (.21)	76.7 (.09)
	Treatment % (SE)			Control Among Treated % (SE)		
All	48.1 (.05)	43.8 (.14)	62.1 (.04)	48.0 (.09)	46.3 (.41)	63.8 (.05)
All Hispanic	46.4 (.19)	41.2 (.62)	42.8 (.16)	53.7 (.31)	77.6 (.43)	70.4 (.08)
Mexican	42.3 (.25)	41.7 (.21)	43.7 (.13)	44.1 (.73)	82.5 (.14)	62.8 (.52)
NH White	44.7 (.19)	32.5 (.88)	63.0 (.07)	47.1 (.30)	62.3 (.32)	67.3 (.10)
NH Black	52.3 (.10)	44.0 (.17)	69.0 (.08)	43.1 (.16)	55.8 (.19)	50.5 (.04)
	Control Among Hypertensive % (SE)					
All	22.7 (.03)	21.5 (.10)	38.4 (.02)			
All Hispanic	25.0 (.16)	26.2 (.35)	28.7 (.20)			
Mexican	19.2 (.18)	25.1 (.15)	27.3 (.14)			
NH White	22.0 (.09)	19.5 (.47)	41.3 (.03)			
NH Black	22.6 (.05)	22.2 (.11)	34.3 (.07)			

SE, Standard Error; US, United States; NH, Non-Hispanic.

[a] Standardized for age, sex, education and income using 2002 March Current Population Survey.

[b] For the Other Hispanic and Non-Hispanic groups, the small sample size rendered the coefficients and associated standard errors for these groups unstable in the statistical analyses; thus the standardized rates are not reported for these groups separately.

[c] Based on NHANES 2001–2002 sample (aged ≥25 years).

[d] For the Other Hispanic and Non-Hispanic groups, the small sample size rendered the coefficients and associated standard errors for these groups unstable in the statistical analyses; thus the rates and standard errors are not reported for these groups separately.

Table 4

Odds ratio and 95% confidence intervals for results from logistic regression analyses predicting prevalence, awareness, treatment, and control of hypertension by sample[a,b]

				Control	
	Prevalence	**Awareness**	**Treatment**	**Among Treated**	**Among All**
Detroit					
NH Whites[c]	1.00	1.00	1.00	1.00	1.00
Mexican	1.02 (.30, 3.39)	.58 (.07, 4.75)	.87 (.13, 5.76)	NR	NR
NH Blacks	1.75 (1.03, 2.99)[d]	2.11 (1.23, 3.64)[d]	2.49 (1.38, .49)[d]	1.07 (.37, 3.15)	1.49 (.65, 3.44)
Chicago					
NH Whites[c]	1.00	1.00	1.00	1.00	1.00
Mexican	.90 (.62, 1.29)	.53 (.26, 1.06)	.51 (.24, 1.10)	.35 (.14, .88)[d]	.42 (.19, .91)[d]
NH Blacks	1.93 (1.42, 2.63)[e]	1.55 (.97, 2.50)	1.20 (.69, 2.11)	.63 (.39, 1.02)	.88 (.57, 1.36)
NHANES 2001–2002					
NH Whites[c]	1.00	1.00	1.00	1.00	1.00
Mexican	.62 (.51, .76)[e]	.51 (.33, .78)[e]	.76 (.48, 1.19)	.82 (.52, 1.27)	.58 (.38, .89)[d]
NH Blacks	1.81 (1.45, 2.27)[e]	1.26 (.89, 1.77)	1.20 (.84, 1.70)	.62 (.48, .80)[e]	.75 (.60, .94)[d]

NH, Non-Hispanic.

[a]Controlling for age, sex, education, income and BMI. NR indicates that the sample size rendered the coefficients and associated standard errors unstable in the statistical analyses; thus they are not reported.

[b]Due to small sample size, the results from the other Hispanic and Non-Hispanic groups were omitted.

[c]Reference category.

[d]$P<.05$.

[e]$P<.01$.