SELF-REPORTED DIABETES AND HYPERTENSION AMONG ARAB AMERICANS IN THE UNITED STATES

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Objective: The prevalence of diabetes and hypertension is increasing in the United States. Estimates for Blacks and Hispanics are higher compared to non-Hispanic Whites. When comparing estimates among racial and ethnic groups, Whites are used as the reference category. Whites are a very heterogeneous group, comprising persons having origins in Europe, North America, or the Middle East. The objective of this paper was to examine the association between nativity and self-reported diabetes and hypertension among a sample of non-Hispanic Whites including individuals born in the Middle East (referred to as Arab Americans; $n=425$) and born in the United States ($n=79,228$).

Design: We use data from the 2000–2003 National Health Interview Surveys (NHIS). The NHIS is an annual, face-to-face interview of the civilian, noninstitutionalized US population that uses a three-stage stratified cluster probability sampling design.

Main Outcome Measures: Logistic regression was used to estimate odds ratios and 95% confidence intervals for the association between nativity and self-reported diabetes and hypertension among non-Hispanic Whites.

Results: We found that the prevalence of diabetes was 4.8% for Arab Americans and 6.9% for non-Hispanic Whites (not significant). Similarly, the prevalence of hypertension was 13.4% for Arab Americans and 24.5% for non-Hispanic Whites ($P<.0001$). No association between country of birth, diabetes, or hypertension was seen.

Conclusions: Nativity status was not significantly associated with self-reported diabetes and hypertension among non-Hispanic Whites. Future studies should examine ethnic heterogeneity among non-Hispanic Whites. (*Ethn Dis*. 2006;16:699–705)

Key Words: Ancestry, Arab American, Diabetes, Hypertension, Immigrants

INTRODUCTION

Chronic conditions, such as diabetes and hypertension, are important public health issues in the United States. They are increasing for the US population in general, but estimates for Blacks and Hispanics are consistently higher compared to those for non-Hispanic Whites.[1,2] Although non-Hispanic Whites are usually used as the reference category for health comparisons in the United States, non-Hispanic Whites are a heterogeneous group.[3] According to the Office of Management and Budget, non-Hispanic White refers to persons having origins in Europe, North America, or the Middle East.[3] Therefore, using Whites as the reference group may miss variations in the health status of other groups within the White category.

Because of the homogeneity assumption assigned to the White category, little attention has been paid to the health status of subgroups within the White category. For example, Arab Americans, a subgroup within the White category, may exhibit worse health outcomes compared to non-Hispanic Whites as a whole.[4–9] Research shows that the prevalence of diabetes and hypertension is higher for Arab Americans compared to non-Hispanic Whites. For example, the prevalence of self-reported diabetes ranged from 7% to 23% for Arab Americans[4–6] compared to 7.4% reported for non-Hispanic Whites.[7] The prevalence of self-reported hypertension ranged from 16% to 44% for Arab Americans[4,8,9] compared to 28.9% for non-Hispanic Whites.[1] Although these estimates show that the prevalence of diabetes and hypertension is lower or higher in Arab Americans compared to non-Hispanic Whites, the estimates are from small convenience samples in community studies.[8] Finally, immigrant health research in the United States, specifically research on Hispanics and Asians, shows that recent immigrants usually have better health outcomes compared to the general US population.[10] Although existing evidence replicates these findings among Arab Americans, the results are from small, community-based and convenience samples in Michigan. Therefore, the use of population-based data will help clarify some of the issues highlighted here.

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Arab Americans should be included in the current discourse on race/ethnicity, immigration, and health for a number of reasons. First, according to some studies, Arab Americans show worse health outcomes compared to non-Hispanic Whites. Second, the Arab American population has been growing

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dramatically over the past two decades (660,000 in 1980 to 1,189,731 in 2000 – an 80% increase).[11,12] Third, previous research has stressed the importance of immigration and its effects on health. Therefore, using data from the 2000–2003 National Health Interview Surveys (NHIS), this study investigates the association between nativity and self-reported diabetes and hypertension among a sample of non-Hispanic Whites, those born in the Middle East and those born in the United States.

METHODS

The NHIS is an annual, face-to-face interview of the civilian, noninstitutionalized household population of the United States that uses a three-stage stratified cluster probability sampling design.[13–16] The NHIS consists of a core set of questions (questions that are repeated yearly) and supplemental questions/modules. For the first time in 2000, the NHIS questionnaires included a question on region of birth that categorized respondents into 1 of 12 categories, based on their country of origin.[13] Data for these analyses included the records of adults 18 years of age and older. The combined sample for 2000–2003 consists of 127,596 persons. The analyses for this paper were limited to non-Hispanic Whites who were born in the United States (n=79,228) and those who reported being born in the Middle East (hereafter referred to as Arab Americans, n=425) for a total sample of 79,653.

The outcomes for this study were self-reported diabetes and hypertension. Diabetes status was collected with the question, ''Have you ever been told by a doctor or health professional that you have diabetes or sugar diabetes?'' For women, the phrase, ''Other than pregnant'' was added prior to the question for diabetes to exclude cases of gestational diabetes. Consistent with NHIS analyses, responses from survey participants who said they had ''borderline'' diabetes were treated as unknown with respect to diabetes and were included among those reporting having no diabetes.[17] Self-reported hypertension was collected with the question, ''Have you ever been told by a doctor or other health professional that you have hypertension, also called high blood pressure?''

The main independent variable was country of birth among non-Hispanic Whites, and it was determined from three questions. Race was determined by asking, ''What race do you consider yourself to be?'' with a follow-up question, ''Which one of these groups, would you say BEST represents yourself?'' The choices were White, Black/African American, American Indian and Alaska Native, Native Hawaiian and Pacific Islander, and other. The first question was asked of all survey participants, while the second was asked of those who answered more than one race to the first question. These answers were summarized by NHIS as follows: White only, Black/African American only, Asian only, American Indian or Pacific Islander only, Other race only, or multiple race only. Ethnicity was established from the question: ''Do you consider yourself Hispanic/Latino?'' The question for ethnicity was asked before the question for race. A question with regard to region of birth with the following choices also was asked: United States; Mexico/Central America/Caribbean Islands; South America; Europe; Russia; Africa; Middle East; Indian subcontinent; Asia; Southeast Asia; and elsewhere (including Canada); and unknown. For these analyses, non-Hispanic White was determined from those who answered White to the race question and ''no'' to the ethnicity question. Among non-Hispanic Whites, we further classified them by their country of birth. Those who answered that they were born in the United States were classified as Whites and those who answered that they were born in the Middle East were classified as Arab Americans.

Covariates included several demographic, socioeconomic status, and access to care variables. The demographic variables included age, sex, and marital status. Age, collected as a continuous variable, was coded as 18–45 and 46–85 years of age. Sex (male/female) was included in the analysis as collected during the interview. Marital status was coded as married or unmarried. The term married encompasses the categories married and separated; while unmarried comprises individuals indicating single, living with a partner, widowed, or divorced.

The socioeconomic variables included education and income. Education was collected as a continuous variable from 0 to 21 and, congruent with other studies,[18] was categorized as: 1) less than high school diploma; 2) high school diploma or general equivalency diploma (GED); 3) some college, vocational, or technical school or associate's degree; or 4) bachelor's, master's, or professional degree. Income was collected by asking each participant to select his/her total annual income from 12 categories (ranging from \$0 to \$75,000 and a refusal category) and based on the sample distribution was categorized as $<$\$19,999; $\geq$\$19,999 to $<$\$44,999; and $\geq$\$44,999. Due to the large number of missing values, the multiple imputations income files provided by the National Center for Health Statistics were used for these analyses.[19]

The residence status variables included region of residence in the United States, citizenship status, and duration of US residency. Region of residence was included in the analyses as collected (Northeast, South, West, and Midwest). Citizenship status was classified as US citizen vs non-citizen. Duration of US residency was categorized as $<$5 years, $\geq$5 years and $<$15 years, and $\geq$15 years.

The health behavior and other variables included body mass index

(BMI), smoking status, alcohol use, physical activity, health insurance, and self-rated health. The BMI (kg/m^2) was calculated by using self-reported weight and height and was categorized as $<25.0\ kg/m^2$ (healthy weight) and $\geq 25.0\ kg/m^2$ (overweight including obese).[20] Smoking status was categorized as current, former, and never. Alcohol use was categorized as current, former, and abstainer. Physical activity was categorized as active vs not active. Health insurance was collected by using a detailed question regarding multiple sources of insurance and recoded as private, public, and non-coverage. Finally, self-rated health was collected by using the question "Would you say your health in general is excellent, very good, good, fair, or poor?" Consistent with previous studies,[21–25] self-rated health was recoded as excellent, very good, or good versus fair or poor.

Descriptive statistics for the characteristics of the sample and prevalence of diabetes and hypertension were calculated for Arab Americans and non-Hispanic Whites. To determine significant differences, chi-square (discrete variables) and *t* tests (continuous variables) were used. Chi-square tests were used to assess significant differences in the prevalence of diabetes and hypertension between groups.

Logistic regression was used to estimate the strength of the association between country of birth and the prevalence of diabetes and hypertension among non-Hispanic Whites. Specifically, five sets of analyses were performed: 1) crude odds ratios (ORs); 2) ORs adjusted for demographic characteristics; 3) ORs adjusted for demographic characteristics and socioeconomic characteristics; 4) ORs additionally adjusted for residence status; and 5) ORs additionally adjusted for health behaviors including health insurance and self-rated health.

Data management procedures were carried out with SAS,[26] and the statistical analyses were conducted by using SUDAAN.[27] SUDAAN takes into account the complex sampling design yielding unbiased standard error estimates. In the tables, the sample sizes were unweighted. However, estimates for means, proportions, standard errors, and ORs with their 95% confidence intervals (CIs) were weighted.

Table 1. Distribution of selected characteristics for Arab Americans and non-Hispanic Whites (NHIS 2000–2003, *N*=79,653)

Characteristics (%)	Arab Americans (*n*=425)	non-Hispanic Whites (*n*=79,228)	*P* value
Demographic variables			
Age (years)			
18–45	65.6 (3.48)	51.1 (.29)	.0004
46–85	34.4 (3.48)	48.9 (.29)	
Female	47.4 (2.66)	51.9 (.21)	.11
Married	67.3 (2.64)	66.5 (.29)	.75
Region of residence			
Northeast	25.4 (3.11)	19.8 (.36)	<.0001
South	23.2 (4.88)	29.2 (.44)	
West	21.3 (2.79)	34.8 (.47)	
Midwest	30.2 (4.06)	16.2 (.34)	
Socioeconomic status			
Education			
Less than high school	23.4 (3.39)	14.9 (.26)	<.0001
High school diploma or GED	25.6 (2.53)	38.1 (.30)	
Some college	22.6 (2.89)	24.8 (.26)	
Professional degree	24.4 (3.60)	22.2 (.27)	
Income			
<$19,999	37.9 (4.32)	35.0 (.35)	.66
≥$19,999 to <$44,999	33.5 (4.15)	37.2 (.29)	
≥$44,999	28.7 (3.40)	27.8 (.35)	
Health insurance			
Private	57.0 (3.66)	67.2 (.29)	.002
Public	19.1 (2.52)	21.9 (.24)	
None	23.9 (3.08)	11.0 (.17)	
Health and lifestyle behaviors			
Smoking status			
Current	21.6 (2.53)	23.8 (.23)	.66
Former	15.9 (2.05)	25.1 (.19)	
Never	62.5 (2.98)	51.1 (.25)	
Alcohol use			
Current	8.3 (1.48)	15.2 (.18	<.0001
Former	42.5 (3.63)	66.3 (.37)	
Abstainer	49.2 (3.83)	18.5 (.32)	
Physically active	43.1 (2.91)	47.4 (.39)	.15
BMI ≥25 kg/m^2	51.0 (3.07)	57.0 (.25)	.05
Self-rated health (fair or poor)	13.5 (2.12)	11.0 (.18)	.24
Diabetes	4.8 (1.40)	6.9 (.11)	.13
Hypertension	13.4 (2.33)	24.5 (.20)	<.0001

Standard errors in parentheses. GED=general equivalency diploma.

RESULTS

Table 1 presents the distribution of selected covariates for Arab Americans and non-Hispanic Whites. In general, Arab Americans were younger (*P*=.0004) and more likely to live in the Northeast and Midwest than non-Hispanic Whites (*P*<.0001). In addi-

tion, compared to Arab Americans, non-Hispanic Whites were less likely to have less than a high school diploma/GED ($P<.0001$), be a current alcohol user ($P<.0001$), and to be uninsured ($P=.002$). Compared to non-Hispanic Whites (57.0%), a lower proportion of Arab Americans (51.0%) were overweight or obese ($P=.05$). The prevalence of diabetes and hypertension for Arab Americans (4.8% and 13.4%, respectively) was lower than non-Hispanic Whites (6.9% and 24.5%, respectively). However, only the difference observed for hypertension was significant ($P<.0001$). For Arab Americans only, more than one half (57.3%) were US citizens and 45.4% lived in the United States for ≥15 years (data not shown).

Table 2 shows the prevalence of diabetes and hypertension by selected covariates for Arab Americans and non-Hispanic Whites. For individuals between the ages of 46 and 85 years, the prevalence of diabetes was higher for Arab Americans (12.7%) compared to non-Hispanic Whites (11.7%, $P<.0001$). With regard to income, the prevalence of diabetes was higher for Arab Americans only in the highest income category. More specifically, for individuals reporting an income ≥$44,999, the prevalence of diabetes was higher for Arab Americans (4.4%) compared to non-Hispanic Whites (3.8%, $P<.0001$). The prevalence of diabetes decreased as length of stay in the United States increased. For Arab Americans in the United States <5 and ≥15 years, the prevalence of diabetes was 7.5% and 7.0% ($P<.01$), respectively.

For both racial/ethnic groups, the prevalence of hypertension increased as educational attainment decreased (Table 2). In addition, the prevalence of hypertension was higher for non-Hispanic Whites for every level of education than for Arab Americans ($P<.01$). In contrast to diabetes, the prevalence of hypertension was positively associated

Table 2. Prevalence of diabetes and hypertension by selected covariates for Arab Americans and non-Hispanic Whites (NHIS 2000–2003)

Characteristics (%)	Diabetes			Hypertension		
	Arab American	Non-Hispanic White	*P* value	Arab American	Non-Hispanic White	*P* value
Demographic variables						
Age (years)						
18–45	.6 (.42)	2.3 (.09)	<.001	7.9 (2.09)	9.9 (.19)	<.001
46–85	12.7 (3.55)	11.7 (.19)		23.8 (4.94)	39.7 (.29)	
Sex						
Female	4.1 (1.34)	6.5 (.13)	<.001	15.2 (3.5)	24.6 (.27)	.49
Male	5.3 (2.31)	7.4 (.17)		11.8 (3.1)	24.4 (.25)	
Marital status						
Married	4.9 (1.86)	7.0 (.13)	<.001	8.6 (2.19)	24.8 (.23)	<.001
Not married	4.5 (1.79)	6.7 (.16)		23.4 (5.18)	24.0 (.33)	
Region of residence						
Northeast	10.0 (4.38)	6.5 (.24)	<.001	13.9 (4.11)	23.4 (.41)	<.001
South	2.3 (1.57)	6.8 (.19)		12.3 (4.41)	23.6 (.34)	
West	3.7 (1.91)	7.7 (.20)		7.5 (2.98)	26.5 (.39)	
Midwest	3.0 (1.53)	5.9 (.28)		18.0 (5.72)	23.2 (.43)	
Socioeconomic status						
Education						
Less than high school	9.4 (3.12)	12.7 (.36)	<.001	24.0 (7.12)	35.8 (.56)	<.001
High school diploma or GED	7.2 (3.85)	7.8 (.19)		12.1 (4.29)	27.7 (.33)	
Some college	2.7 (1.58)	6.1 (.22)		11.6 (4.59)	21.6 (.40)	
Professional degree	1.3 (1.30)	5.4 (.21)		10.9 (3.20)	21.3 (.38)	
Income						
<$19,999	2.1 (1.54)	5.0 (.20)	<.001	10.1 (5.44)	16.7 (.37)	<.001
≥$19,999 to <$44,999	3.5 (4.04)	4.1 (.18)		8.4 (4.85)	17.5 (.34)	
≥$44,999	4.4 (5.09)	3.8 (.19)		11.8 (4.78)	18.4 (.36)	
Health insurance						
Private	2.6 (1.72)	4.5 (.11)	<.001	11.3 (2.73)	18.0 (.21)	<.01
Public	13.6 (4.35)	15.9 (.30)		26.9 (6.96)	49.5 (.41)	
None	2.3 (1.65)	3.9 (.22)		8.0 (4.08)	14.9 (.46)	
Health and lifestyle behaviors						
Smoking status						
Current	2.6 (1.64)	5.3 (.18)	<.001	14.2 (5.42)	19.8 (.32)	<.001
Former	9.2 (5.84)	10.6 (.26)		14.3 (4.39)	33.6 (.40)	
Never	4.2 (1.31)	5.8 (.14)		12.8 (2.86)	22.4 (.26)	
Alcohol use						
Current	8.8 (4.75)	14.8 (.37)	<.001	28.8 (8.81)	36.2 (.52)	<.001
Former	4.0 (1.58)	4.5 (.11)		13.5 (3.45)	20.5 (.21)	
Abstainer	4.7 (2.22)	9.3 (.29)		11.1 (3.04)	29.8 (.49)	
Physically active						
Yes	4.2 (1.65)	5.0 (.14)	<.001	9.9 (2.77)	19.0 (.25)	<.001
No	5.2 (2.10)	8.6 (.17)		16.1 (3.27)	29.5 (.29)	
BMI						
≥25 kg/m^2	6.8 (2.41)	9.6 (.16)	<.001	16.7 (3.59)	31.2 (.27)	<.001
<25 kg/m^2	2.8 (1.10)	3.1 (.11)		11.1 (2.96)	15.5 (.25)	
Self-rated health						
Excellent, very good, good	2.1 (1.28)	4.7 (.10)	<.001	9.1 (2.14)	21.1 (.18)	<.001
Fair or poor	21.7 (5.13)	24.8 (.49)		40.8 (7.93)	52.4 (.57)	

Standard errors in parentheses.
GED = General Equivalency Diploma.

Table 3. Crude and adjusted odds ratios* (95% confidence intervals) for diabetes for Arab Americans and non-Hispanic Whites: NHIS 2000–2003

Characteristics	Diabetes				
	Crude	Model 1	Model 2	Model 3	Model 4
Arab American	.67 (.37–1.24)	.83 (.47–1.49)	1.03 (.57–1.84)	1.15 (.42–3.16)	.98 (.35–2.76)
Non-Hispanic White	1.00	1.00	1.00	1.00	1.00

* ORs adjusted for age, sex, and marital status (model 1); additionally adjusted for US region and length in the United States (model 2); additionally adjusted for health insurance, education; and income (model 3); and additionally adjusted for smoking, alcohol use, physical activity, body mass index, and self-rated health (model 4).

with length of stay in the United States. For Arab Americans in the United States <5, 5–15, and ≥15 years, the prevalence of hypertension was 4.1%, 15.8%, and 16.4% ($P<.01$), respectively (data not shown).

Although Arab Americans appear to be less likely to report having diabetes, no association was seen between country of birth and diabetes. This pattern persists after adjustment for all covariates (Table 3, model 4). For hypertension, although Arab Americans were twice (OR .48, 95% CI .32–.71) less likely to report having hypertension than non-Hispanic Whites in the crude analysis, this association was explained in the fully adjusted model (Table 4, model 4).

CONCLUSIONS

Overall, this study showed that Arab Americans had a lower prevalence of diabetes and hypertension compared to non-Hispanic Whites. Although these patterns persist after adjusting for all covariates, the association between ancestry and diabetes and hypertension did not reach a significant level, which suggests no difference between Arab Americans and Whites.

Existing research on the prevalence of diabetes in Arab Americans provide mixed results.[4–6,8,28] For example, three convenience sample studies showed that the prevalence of self-reported diabetes ranged from 13% to 19%,[4,8,28] while probability sample studies that assessed self-reported diabetes showed that the prevalence of diabetes was 9.8% for Arab Americans[5] and 14.5% for Chaldeans (Iraqi Catholics).[6] When compared to previous studies, our study's results found a lower prevalence of diabetes for Arab Americans. Although the estimates from the probability sample studies may be reliable, the estimates from the convenience sample studies may suffer from selection bias because unhealthy people may be more willing to participate in such studies. Furthermore, despite the fact that the NHIS is a national study and may be more representative of Arab Americans in the United States, national estimates obtained from the NHIS may dilute the higher prevalence of diabetes in specific Arab American enclaves.

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Prevalence estimates of diabetes for Arab Americans in our study may be an underestimate since approximately one third of individuals with diabetes are not aware they have the disease.[29] For example, according to the National Health and Nutrition Examination Survey (1999–2000), the crude prevalence of self-reported and undiagnosed diabetes was 5.9% and 2.4%, respectively.[7] In addition, when compared to Whites, the prevalence of diabetes may be lower among Arab Americans because they are younger than Whites.[11] Given that diabetes increases with age[29] and that Arab Americans were younger than non-Hispanic Whites in our sample, the true prevalence of diabetes may be lower among Arab Americans. Furthermore, because of cultural and language barriers, access to and quality of the health care of Arab Americans may be poor. Therefore, Arab Americans may be less likely to have a regular provider, or if they do have a provider, the quality of the care they receive may be suboptimal. In addition, among Arab Americans, disease and illness are less likely to be discussed among individuals[30,31]; therefore, Arab Americans may underreport their illnesses compared to Whites.

A notable finding in our study is the association between acculturation and both diabetes and hypertension. Re-

Table 4. Crude and adjusted odds ratios* (95% confidence intervals) for hypertension for Arab Americans and non-Hispanic Whites: NHIS 2000–2003

Characteristics	Hypertension				
	Crude	Model 1	Model 2	Model 3	Model 4
Arab American	.48 (.32–.71)	.57 (.38–.88)	.58 (.38–.90)	.75 (.40–1.42)	.84 (.42–1.71)
Non-Hispanic White	1.00	1.00	1.00	1.00	1.00

* ORs adjusted for age, sex, and marital status (model 1); additionally adjusted for US region and length in the United States (model 2); additionally adjusted for health insurance, education, and income (model 3); and additionally adjusted for smoking, alcohol use, physical activity, body mass index, and self-rated health (model 4).

search on immigrant health has shown that immigrants enjoy better health compared to nonimmigrants.[32] However, as the length of stay in the United States increases and immigrants become more acculturated, their health status deteriorates and parallels that of nonimmigrants.[32] In our study, the prevalence of diabetes decreased as length of stay in the United States increased. This finding is consistent with those of other studies that showed that less acculturated Arab immigrants were more likely to have diabetes.[33] Less acculturated immigrants have not adopted some of the healthy behavioral lifestyles (ie, low fat diet and physical activity) currently observed in our society. This lack of adaptation may result in a higher prevalence of diabetes. With regard to hypertension, two studies assessed the association between acculturation and blood pressure among Arab Americans.[4,9] Even though the first study showed no association between acculturation and blood pressure, it showed that the strongest predictors of blood pressure were BMI and waist-to-hip ratio, both of which were inversely correlated with age, education, English language preference, employment outside of the home, and parental school involvement.[9] The second study showed a direct association between duration in the United States and blood pressure.[4] These findings are consistent with those from our study, which showed the prevalence of hypertension increases with increasing duration in the United States. In contrast to diabetes, the mechanism by which acculturation relates to hypertension may be mediated by the stress associated with mainstream US culture.[34]

Among the strengths of this study are the use of multiple years of a national representative sample and the large sample size, which allows the ability to control for numerous potential confounders while also examining interactions. However, a few shortcomings may have affected our results. The first limitation is the small sample size of Arab Americans, so the study may be underpowered to detect a significant difference for diabetes. However, we repeated the analyses separately for diabetes for every year (sample size for Arab Americans was between 100 and 115 per year), and Arab Americans consistently exhibited a lower prevalence than non-Hispanic Whites. Therefore, we would not anticipate that if a larger sample size were available, our results would change. Another limitation is the cross-sectional nature of the data that precludes making inferences regarding cause and effect. Finally, the use of self-report data may be problematic. However, self-report data for diabetes and hypertension are highly correlated with physician's records.[35–37] Therefore, if any difference in reporting these diseases were to occur, it would have been nondifferential, underestimating the study's results.

This study underscores the importance of examining the monolithic idea of homogeneity for racial group category. Specifically, our study shows that heterogeneity in the prevalence of diabetes and hypertension could exist among Whites, the widely used reference category for studies in the United States. This study also calls attention to health variations in the disaggregate groups. Specifically, our study shows that the prevalence of diabetes and hypertension was lower for Arab Americans than the prevalence observed for Whites. Although our findings did not concur with results of previous studies, this is the first step to understanding the health of Arab Americans, a subgroup within the White category, in the United States. Future studies should incorporate better measurements of socioeconomic status, health behavior, and especially questions regarding acculturation and language use. This type of research could help unmask hidden patterns of disease distribution not only among Whites but also in other racial/ethnic groups.

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Data analysis interpretation: Dallo, Borrell
Manuscript draft: Dallo, Borrell
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