Health Risks, Chronic Diseases, and Access to Care Among US Pacific Islanders

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BACKGROUND: Because Pacific Islanders and Asian Americans have often been aggregated in federal health surveys, we assessed whether they differ substantially in important health measures.

DESIGN: Retrospective analyses of the 2005–2007 Behavioral Risk Factor Surveillance System (BRFSS) surveys.

PARTICIPANTS: A total of 2,609 Pacific Islanders, 17,892 Asians, and 894,289 whites over age 18.

MEASUREMENTS: We compared self-reported health risk factors (smoking, BMI ≥ 25 kg/m^2, alcohol intake, physical activity, fruit/vegetable intake), chronic diseases (diabetes, hypertension, coronary heart disease, asthma, hypercholesterolemia, arthritis, fair or poor health status), and access to care (insurance status, cost barriers, and regular physician) for Pacific Islanders relative to Asian Americans and whites. Logistic regression was used to adjust for sociodemographic factors.

RESULTS: Pacific Islanders were more likely than Asian Americans to report an elevated body-mass index (adjusted odds ratio 2.26; 95% confidence interval 1.80, 2.84), current smoking (2.15; 1.57, 2.93), and high alcohol intake (3.14; 1.60, 6.18), but also more likely to report adequate physical activity (1.62; 1.23, 2.14). Pacific Islanders reported higher adjusted rates of hypertension (1.50; 1.06, 2.13), diabetes (1.82; 1.25, 2.63), asthma (2.32; 1.65, 3.25), and arthritis (1.68; 1.20, 2.35). Pacific Islanders also more frequently reported having fair or poor health (1.46; 1.05, 2.04). Most differences in self-reported health status and chronic disease outcomes were mediated by higher rates of overweight and obesity, but not higher rates of smoking, among Pacific Islanders. Differences in smoking, hypertension, and diabetes were more pronounced among Pacific Islander women than men. Relative to whites, Pacific Islanders were more likely to report a diagnosis of diabetes (1.56; 1.13, 2.14) and less likely to report arthritis (0.61; 0.46, 0.82). All other outcomes measures were statistically similar for whites and Pacific Islanders.

CONCLUSION: Health surveys and policies should distinguish between Pacific Islanders and Asian Americans given the significantly higher rates of health risks and chronic diseases among Pacific Islanders.

KEY WORDS: Pacific Islander Americans; Asian Americans; health care disparities; chronic disease.

Asian Americans and Pacific Islanders (AAPIs) historically have been aggregated in most demographic and health surveys, including those directed by the National Center for Health Statistics (NCHS) such as the National Health and Nutrition Examination Survey (NHANES) and the National Health Interview Survey (NHIS). In most health studies, this combined group has been reported to have lower levels of deleterious health risk factors such as smoking and obesity and more positive health outcomes compared to white Americans. For example, a study by the Centers for Disease Control (CDC) suggested that AAPIs had a lower prevalence of cardiovascular disease in 19 of 50 states.[1] Another study showed that among racial/ethnic subgroups in the US, AAPIs were least likely to report fair or poor health.[2] As a consequence of this aggregation, the need for targeted interventions to address health disparities affecting AAPIs is often overlooked.

However, significant disparities in health risks and outcomes affecting Pacific Islanders may be masked by the larger size and relatively good health of the Asian American group. Asian Americans comprise approximately 4.2% of the US population, whereas Americans who identify themselves as full or part Pacific Islander comprise 0.3%, or nearly 1 million people.[3] Compared to Asian Americans, Pacific Islanders have higher poverty rates, lower incomes, lower educational attainment, and larger families.[4,5] In addition, some national mortality estimates show that Pacific Islanders have much higher mortality rates from cardiovascular disease, stroke, and cancer than Asian Americans.[4] Native Hawaiians, for example, demonstrate disease-specific mortality rates more than four times as high as the total US population.[4] Age-adjusted heart disease death rates for full Hawaiians are nearly 4.5 times higher than for non-Hawaiians living in Hawaii.[6]

Given the arbitrary nature of combining Asian Americans and Pacific Islanders, in 1997 the Office of Management and Budget (OMB) issued revisions for the classification of race/ethnicity data to be implemented by 2003.[7] One goal of this reclassification was to separate the reporting of AAPIs into Asian Americans and Native Hawaiians and other Pacific Islanders (NHOPI). This revision in statistical policy changed the way the US Census and some, but not all, health surveys collect demographic data. The aim of our study was to analyze the distribution of self-reported behavioral risk factors, disease outcomes, and access to care for Pacific Islander Americans compared to Asian Americans and whites using recently disaggregated nationally representative health survey data.

METHODS

Data Source

We analyzed Behavioral Risk Factor Surveillance System (BRFSS) data from 2005, 2006, and 2007. The BRFSS is an annual US telephone-based health survey of more than 350,000 adults, sponsored by the Centers for Disease Control and Prevention in collaboration with state and territorial health departments.[8] BRFSS data are collected monthly in all 50 states, the District of Columbia, US Virgin Islands (USVI), Puerto Rico, and Guam. The survey includes core modules on health status, selected chronic diseases, and access to care each year in all states, while standardized optional modules are added in alternate years or at the discretion of each state conducting the survey.

Data are collected from a random sample of adults over the age of 18 (one per household) through a computer-assisted telephone interview in English or Spanish.[8] Adults residing in prisons, hospitals, nursing homes, college dormitories, or military bases are not eligible. BRFSS data are also weighted to account for unequal probabilities of selection and unequal patterns of survey non-response.

Study Population

We used the BRFSS surveys to evaluate the self-reported frequency and predictors of chronic disease outcomes and health status in Pacific Islander Americans compared with Asian Americans. The inclusion criteria for the study cohort were self-reported categorization of race/ethnicity as Asian American, Pacific Islander (including Native Hawaiians and other Pacific Islanders), or white. Because this study used publicly available, de-identified data, it was deemed exempt from review by the Human Studies Committee of Harvard Medical School.

Study Variables

Sociodemographic variables (Table 1) included age, sex, race/ethnicity, education (defined as college degree and above vs. less than college degree), income (greater or less than $35,000/year), and employment (holding a current job or not). Behavioral variables included current smoking, being overweight (BMI $\geq$25 kg/m^2), heavy alcohol intake (defined for adult men as having more than two drinks per day and for adult women as having more than one drink per day),

Table 1. Sociodemographic Characteristics, Health Risks, Chronic Conditions, and Access to Care Measures Among Pacific Islander and Asian American Adults in the Behavioral Risk Surveillance System, 2005–2007[a]

Variable	Asian American (%)	Pacific Islander (%)	P value
Sociodemographics			
Age (years)			<0.001
18–24	12.4	24.2	
25–34	23.3	28.0	
35–44	24.9	19.0	
45–54	19.0	15.4	
55–64	10.6	8.5	
$\geq$65	9.8	5.0	
Female	45.4	42.3	0.25
Annual income ($\geq$$35,000)	62.7	54.0	<0.001
College graduate	63.0	34.4	<0.001
Current employment	67.2	69.7	0.28
Risk factors			
Current smoking	9.9	23.6	<0.001
Body mass index (kg/m$^{2)}$			<0.001
<25	60.9	42.5	
25–30	28.6	34.7	
>30	6.7	20.0	
Heavy alcohol intake	1.5	5.9	0.03
Meet physical activity recommendations[b]	39.5	52.2	<0.001
Adequate fruit/vegetable intake[b]	71.0	76.6	0.03
Chronic diseases			
Hypertension[b]	17.8	20.6	0.26
Diabetes	5.7	7.3	0.13
Coronary heart disease	1.9	2.3	0.57
Hypercholesterolemia[b]	33.5	29.6	0.34
Asthma	4.0	8.3	<0.001
Arthritis[b]	12.3	13.8	0.40
Fair or poor health	9.5	12.7	0.058
Access to care			
No regular primary care physician	22.9	25.0	0.38
Avoided seeing doctor due to cost	9.8	13.2	0.02
No health insurance (all ages)	11.8	17.7	0.003

[a]All estimates were weighted to account for the complex survey design
[b]Data only available from 2005 and 2007

adequate physical activity ($\geq$20 min of vigorous physical activity three times weekly or $\geq$30 min of moderate physical activity five times weekly), and adequate fruit and vegetable consumption (consuming $\geq$5 servings of fruits or vegetables daily). Subjects also reported their subjective health status and whether a doctor had diagnosed them with hypertension, diabetes, high cholesterol, asthma, or arthritis and coronary heart disease. Measures of access to care included whether respondents had a personal doctor, whether they had needed to see a doctor in the past 12 months but did not because of cost, and insurance status. Of note, questions about physical activity, fruit/vegetable intake, hypertension, and hypercholesterolemia were not included in the 2006 BRFSS survey.

Data Analysis

We compared each variable in these three groups (behavioral risk factors, chronic diseases, and access to care) for Pacific Islanders relative to Asian Americans and to whites in bivariate analyses with chi-square tests and unadjusted odds ratios. To

assess intergroup differences after controlling for demographic variables, we used logistic regression models initially adjusted for age, sex, and the fixed effects of states and territories in the BRFSS survey with the largest PI populations (California, Hawaii, Utah, Washington, Alaska, and Guam). We then built models adjusted for age, sex, residence in the above states/territories, income, and education to adjust for demographic and socioeconomic factors. These were our main predefined logistic regression models. Finally, in order to examine whether important risk factors for disease such as BMI and smoking mediated the relationship between disease outcomes in Pacific Islander versus Asian Americans, we built sequential models adjusting for these covariates in addition to those in the main model. We also fitted the main models stratified by sex. SAS version 9.1 (Cary, NC) and SAS-callable SUDAAN (Research Triangle, NC) were used for all statistical analyses to account for the complex survey design.

RESULTS

The study cohort included 2,609 Pacific Islanders, 17,892 Asian Americans, and 894,289 whites. Table 1 shows the sociodemographic and health characteristics of Pacific Islanders and Asian Americans. Relative to Asian Americans, Pacific Islanders were younger; less likely to have a college degree; more often current smokers, overweight, or heavy alcohol drinkers; more often met recommendations for adequate physical activity; and lacked health insurance more commonly.

In adjusted regression models (Table 2), Pacific Islanders were significantly more likely than Asian Americans to report BMI ≥ 25 kg/m^2, current smoking, and increased alcohol intake, but also reported higher frequency of adequate physical activity. In the main regression models adjusting for demographic and socioeconomic covariates, Pacific Islanders reported higher rates of many chronic diseases compared to Asian Americans, including hypertension, diabetes, asthma,

and arthritis. Furthermore, Pacific Islanders more frequently reported having fair or poor health. No differences were found in measures of access to care.

Further adjustment of the main models for smoking yielded only minor changes in adjusted odds ratios for the outcomes more frequently reported by Pacific Islanders (Table 2). However, adjustment of the main models for BMI category made the adjusted odds ratio for hypertension, diabetes, arthritis, and fair or poor health statistically non-significant, and decreased the odds ratio for asthma. These findings suggest that BMI, but not smoking, mediates in part the differences in chronic disease outcomes between Pacific Islanders and Asian Americans.

Relative to whites (Table 3), Pacific Islanders were more likely to report a diagnosis of diabetes but less likely to report arthritis. No significant differences were detected for the other risk factors, chronic diseases, or access to care measures. Adjustment for smoking and BMI did not significantly change the adjusted odds ratios for any of the chronic disease or health status outcomes.

When the main logistic regression models comparing Pacific Islanders to Asian Americans were stratified by sex (Table 4), some notable differences appeared. Adjusted odds ratios for heavy alcohol intake were much more elevated for male than female Pacific Islanders. In contrast, smoking rates relative to Asian Americans were significantly more elevated for female Pacific Islanders than for males. Relative rates of hypertension, diabetes, and coronary heart disease were also more elevated for Pacific Islander women than for men, though the difference in coronary heart disease for Pacific Islander women was not statistically significant.

Adjusted analyses stratified by sex for Pacific Islanders and whites showed similar areas of variation (data not shown). Heavy alcohol intake was not significantly different for Pacific Islander and white men, but was significantly less common in Pacific Islander women compared with white women (adjusted odds ratio: 0.42, 95% CI: 0.24, 0.74). Similarly, diabetes rates did not differ significantly between Pacific Islander and white

Table 2. Unadjusted and Adjusted Odds Ratios for Pacific Islanders Relative to Asian Americans

Outcome	Unadjusted OR (95% CI)	Adjusted OR[a] (95% CI)	Adjusted OR[b] (95% CI)	Adjusted OR[c] (95% CI)	Adjusted OR[d] (95% CI)
Current smoking	2.83 (2.08, 3.84)	2.64 (1.94, 3.60)	2.15 (1.57, 2.93)		
Overweight (BMI >25 kg/m^2)	2.22 (1.78, 2.76)	2.26 (1.81, 2.83)	2.26 (1.80, 2.84)		
Heavy alcohol intake	4.07 (1.97, 8.41)	3.79 (1.93, 7.45)	3.14 (1.60, 6.18)		
Adequate physical activity	1.67 (1.27, 2.19)	1.63 (1.24, 2.16)	1.62 (1.23, 2.14)		
Adequate fruit/vegetable intake	1.34 (1.02, 1.75)	1.31 (0.99, 1.74)	1.28 (0.96, 1.70)		
Regular PCP	0.89 (0.70, 1.14)	1.03 (0.79, 1.34)	1.16 (0.87, 1.56)		
Avoided seeing doctor due to cost	1.40 (1.07, 1.83)	1.36 (1.03, 1.79)	1.14 (0.85, 1.52)		
No health insurance (all ages)	1.60 (1.22, 2.10)	1.51 (1.14, 1.99)	1.07 (0.77, 1.48)		
Hypertension	1.20 (0.89, 1.61)	1.64 (1.16, 2.27)	1.50 (1.06, 2.13)	1.50 (1.06, 2.12)	1.23 (0.85, 1.78)
Diabetes	1.31 (0.95, 1.81)	1.82 (1.28, 2.57)	1.82 (1.25, 2.63)	1.84 (1.27, 2.69)	1.43 (0.95, 2.16)
Coronary heart disease	1.22 (0.64, 2.29)	1.68 (0.86, 3.25)	1.56 (0.75, 3.25)	1.60 (0.76, 3.37)	1.30 (0.59, 2.87)
Hypercholesterolemia	0.84 (0.57, 1.23)	0.94 (0.63, 1.41)	0.95 (0.63, 1.43)	0.96 (0.65, 1.41)	0.93 (0.61, 1.41)
Asthma	2.17 (1.57, 3.01)	2.26 (1.62, 3.15)	2.32 (1.65, 3.25)	2.33 (1.68, 3.25)	2.08 (1.48, 2.92)
Arthritis	1.14 (0.85, 1.55)	1.64 (1.19, 2.26)	1.68 (1.20, 2.35)	1.58 (1.11, 2.24)	1.38 (0.98, 1.93)
Fair or poor health	1.39 (1.02, 1.89)	1.66 (1.21, 2.28)	1.46 (1.05, 2.04)	1.37 (0.96, 1.95)	1.28 (0.90, 1.82)

[a]*Using logistic regression to adjust for age, sex, and place of residence*
[b]*Using logistic regression to adjust for age, sex, place of residence, income, and education (main model)*
[c]*Using logistic regression to adjust for age, sex, place of residence, income, education, and smoking*
[d]*Using logistic regression to adjust for age, sex, place of residence, income, education, and BMI*
All estimates were weighted to account for the complex survey design. Statistically significant differences (P<0.05) are denoted in bold
OR = odds ratio; CI = confidence interval; BMI = body mass index; PCP = primary care physician

Table 3. Unadjusted and Adjusted Odds Ratios for Pacific Islanders Relative to Whites

Outcome	Unadjusted OR (95% CI)	Adjusted OR[a] (95% CI)	Adjusted OR[b] (95% CI)	Adjusted OR[c] (95% CI)	Adjusted OR[d] (95% CI)
Current smoking	1.04 (0.98, 1.12)	1.14 (0.84, 1.53)	0.98 (0.72, 1.34)		
Overweight (BMI >25 kg/m^2)	0.84 (0.68, 1.03)	0.91 (0.73, 1.13)	0.90 (0.72, 1.12)		
Heavy alcohol intake	1.07 (0.54, 2.13)	0.80 (0.40, 1.60)	0.78 (0.38, 1.61)		
Adequate physical activity	1.06 (0.82, 1.38)	0.84 (0.64, 1.12)	0.88 (0.67, 1.15)		
Adequate fruit/vegetable intake	1.06 (0.82, 1.37)	1.02 (0.78, 1.35)	0.99 (0.75, 1.29)		
Regular PCP	0.55 (0.43, 0.69)	0.80 (0.62, 1.04)	0.89 (0.68, 1.17)		
Avoided seeing doctor due to cost	1.29 (1.01, 1.64)	1.17 (0.91, 1.50)	0.93 (0.71, 1.23)		
No health insurance (all ages)	1.78 (1.38, 2.28)	1.56 (1.21, 2.02)	1.24 (0.91, 1.69)		
Hypertension	0.68 (0.52, 0.91)	1.18 (0.86, 1.62)	1.11 (0.81, 1.48)	1.12 (0.81, 1.54)	1.23 (0.88, 1.72)
Diabetes	0.97 (0.73, 1.31)	1.75 (1.28, 2.39)	1.56 (1.13, 2.14)	1.56 (1.14, 2.14)	1.76 (1.26, 2.48)
Coronary heart disease	0.47 (0.26, 0.85)	0.98 (0.51, 1.88)	0.90 (0.46, 1.74)	0.91 (0.47, 1.75)	0.94 (0.48, 1.84)
Hypercholesterolemia	0.69 (0.47, 1.00)	0.99 (0.64, 1.51)	0.97 (0.63, 1.49)	0.98 (0.64, 1.50)	1.05 (0.68, 1.63)
Asthma	0.99 (0.74, 1.33)	0.98 (0.72, 1.33)	0.93 (0.68, 1.26)	0.93 (0.68, 1.26)	0.94 (0.69, 1.29)
Arthritis	0.38 (0.29, 0.50)	0.64 (0.48, 0.86)	0.61 (0.46, 0.82)	0.61 (0.46, 0.82)	0.63 (0.47, 0.84)
Fair or poor health	0.91 (0.68, 1.21)	1.42 (1.06, 1.92)	1.19 (0.87, 1.64)	1.18 (0.85, 1.64)	1.27 (0.92, 1.76)

[a]*Using logistic regression to adjust for age, sex, and place of residence*
[b]*Using logistic regression to adjust for age, sex, place of residence, income, and education (main model)*
[c]*Using logistic regression to adjust for age, sex, place of residence, income, education, and smoking*
[d]*Using logistic regression to adjust for age, sex, place of residence, income, education, and BMI*
All estimates were weighted to account for the complex survey design. Statistically significant differences (P<0.05) are denoted in bold
OR = odds ratio; CI = confidence interval; BMI = body mass index; PCP = primary care physician

men, but were higher among Pacific Islander than white women (2.31; 1.49, 3.58). Rates of reported arthritis were significantly lower for Pacific Islanders than for whites among both men and women (adjusted odds ratios 0.61 and 0.62).

DISCUSSION

This study used recent nationally representative survey data to compare self-reported measures of health risk factors, chronic disease, and access to care in Pacific Islanders relative to Asian

Table 4. Adjusted Odds Ratios for Pacific Islanders Relative to Asian Americans by Sex

Outcome	Adjusted OR* (males) (95% CI)	Adjusted OR* (females) (95% CI)
Current smoking	1.67 (1.10, 2.54)	3.40 (2.15, 5.38)
Overweight (BMI >25 kg/m^2)	2.37 (1.71, 3.28)	2.12 (1.57, 2.88)
Heavy alcohol intake	4.06 (1.81, 9.12)	1.81 (0.83, 3.95)
Adequate physical activity	1.51 (1.01, 2.27)	1.75 (1.21, 2.52)
Adequate fruit/vegetable intake	1.22 (0.77, 1.94)	1.35 (0.96, 1.90)
Hypertension	1.38 (0.85, 2.26)	1.71 (1.08, 2.72)
Diabetes	1.12 (0.68, 1.83)	3.32 (1.97, 5.59)
Coronary heart disease	1.06 (0.52, 2.16)	3.35 (0.80, 13.95)
Hypercholesterolemia	0.97 (0.54, 1.72)	0.96 (0.61, 1.50)
Asthma	2.42 (1.44, 4.07)	2.12 (1.41, 3.19)
Arthritis	1.72 (0.99, 2.98)	1.66 (1.12, 2.48)
Fair or poor health	1.52 (0.90, 2.56)	1.32 (0.95, 1.84)
Regular PCP	1.12 (0.79, 1.60)	1.20 (0.74, 1.96)
Avoided seeing doctor due to cost	1.02 (0.67, 1.56)	1.27 (0.85, 1.91)
No health insurance (all ages)	1.13 (0.71, 1.79)	0.98 (0.61, 1.57)

*Using logistic regression to adjust for age, sex, place of residence, income, and education. All estimates were weighted to account for the complex survey design. Statistically significant differences (P<0.05) are denoted in bold
OR = odds ratio; CI = confidence interval; BMI = body mass index; PCP = primary care physician

Americans and whites. We found that Pacific Islanders were significantly more likely than Asian Americans to report some important health risks, including elevated body mass index, current smoking, and high alcohol intake, as well as related chronic diseases including diabetes, hypertension, asthma, and arthritis as well as higher rates of fair or poor health. Several of these differences were mediated by higher rates of overweight and obesity, but not higher rates of smoking, among Pacific Islanders. Differences in smoking, diabetes, and hypertension were more pronounced among Pacific Islander women than men. Measures of access to care did not differ significantly between Pacific Islanders and Asian Americans.

Compared to whites, Pacific Islanders had strikingly similar health risk factors, chronic diseases, and access to care, with non-significant odds ratios ranging from 0.78 to 1.24. The only significant differences were higher odds of diabetes and reduced odds of arthritis among Pacific Islanders compared to whites. These findings suggest that Pacific Islanders and whites may have similar patterns of health risk factors and many chronic diseases, although other research has found elevated all-cause and site-specific cancer mortality for Pacific Islanders (especially Samoans) compared to non-Hispanic whites in the US.[9]

Our findings have five important policy implications. First, future federal surveys should follow OMB guidelines where and when possible to disaggregate data for Pacific Islander and Asian American given the large sociodemographic and health differences between these groups. In some studies, such as NHIS and NHANES, this will require over-sampling of Pacific Islander communities (primarily in Western US states, Hawaii, and Pacific territories) to attain sample sizes large enough for meaningful analyses. We recognize the potential difficulty and costs of this disaggregation, but note that states and territories with large Pacific Islander communities often have many Asian American residents, underscoring the need to measure the health of both of these important subgroups accurately.

Second, we found significantly greater rates of key health risks and chronic diseases among Pacific Islanders compared

to Asian Americans. Taulii found similar results in a smaller cohort, and together with our study, these findings point to the need for targeting obesity, alcohol, and smoking as important risk factors for key chronic diseases such as diabetes and hypertension.[4] Third, the recognition of these "diabesity"-related health disparities among Pacific Islanders can inform future disparity interventions aimed at this community.[10] To date, disparity studies and interventions in the US have largely focused on cancer screening and prevention in both Pacific Islander and Asian American communities.[9,11–14] While these may continue to be important disparities in these groups, increased recognition of the linked epidemics of obesity and diabetes in Pacific Islanders, similar to that in many nations across the Pacific where these communities originate,[15,16] underscores the need for interventions aimed at reducing these specific Pacific Islander disparities in the US. In particular our finding that BMI, but not smoking, largely mediates the differences in reporting chronic diseases between Pacific Islanders and Asian Americans highlights the specific disparity-promoting impact that obesity may have for Pacific Islanders in the US. Both communities appear to exhibit increased risk for obesity as a function of acculturation in the US, but Pacific Islanders may be particularly vulnerable due to especially calorie-rich diets and less restrictive body image perceptions.[17] Emerging community-based interventions for addressing diabetes and obesity in American Samoa may provide models for culturally tailored, rigorously evaluated solutions in Pacific Islander communities.[18,19]

Fourth, relative to Asian Americans we found higher rates of chronic diseases such as diabetes and hypertension among Pacific Islander women but not men, suggesting that interventions need to be not only culturally appropriate, but also gender-specific. Previous work on gender-specific differences in hypertension among Samoan women showed the significant contribution that psychosocial stress associated with culturally prescribed gender roles has on increased blood pressure.[20] Finally, Pacific Islanders' self-reported access to primary care was similar to both whites and Asian Americans for the measures in our study.

This study had a number of strengths. To our knowledge, it is one of the largest studies to use disaggregated Asian American and Pacific Islander health data to evaluate risk factors, disease outcomes, and access to care. The BRFSS is one of the first large national health surveys to report health data from Asian Americans and Pacific Islanders in numbers sizable enough to permit comparisons with reasonable statistical power. Furthermore, the survey over-sampled enough members of both groups (particularly in Western states that contain nearly 80% of the Pacific Islander population) to facilitate sex-stratified analyses.

A number of limitations were also present in this analysis. First, the BRFSS survey utilizes self-reported data that are subject to recall and misclassification bias, and were not verified with clinical or administrative data. However, a growing body of literature suggests that self-reported risk factor, chronic disease, and health status variables are reasonably accurate relative to measured variables.[21–23] Second, the survey's telephone sampling methodology might under-represent those without regular access to telephones, with cell phones, or who speak a language other than English or Spanish, factors that are prevalent within both Asian American and Pacific Islander communities in the US. Third,

because of the limited Pacific Islander sample, some of the subgroup sample sizes were relatively small, as indicated by wide confidence intervals for variables such as coronary heart disease and heavy alcohol intake.

This study demonstrates that Pacific Islanders suffer from increased rates of some important deleterious health risk factors and associated chronic diseases. Understanding the magnitude and determinants of these disparities can help inform targeted interventions to reduce these disparities.

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