

Healthcare Access Among Individuals of Asian Descent in the U.S.

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ABSTRACT

Introduction. Some groups of Asian Americans, especially Asian Indians, experience higher rates of atherosclerotic cardiovascular disease (ASCVD) compared with other groups in the U.S. Barriers in accessing medical care partly may explain this higher risk as a result of delayed screening for cardiovascular risk factors and timely initiation of preventive treatment.

Methods. Cross-sectional data were utilized from the 2006 to 2015 National Health Interview Survey (NHIS). Barriers to accessing medical care included no place to seek medical care when needed, no healthcare coverage, no care due to cost, delayed care due to cost, inability to afford medication, or not seeing a doctor in the past 12 months.

Results. The study sample consisted of 18,150 Asian individuals, of whom 20.5% were Asian Indian, 20.5% were Chinese, 23.4% were Filipino, and 35.6% were classified as “Other Asians”. The mean (standard error) age was 43.8 (0.21) years and 53% were women. Among participants with history of hypertension, diabetes mellitus, or ASCVD (prevalence = 25%), Asian Indians were more likely to report delayed care due to cost (2.58 (1.14,5.85)), while Other Asians were more likely to report no care due to cost (2.43 (1.09,5.44)) or delayed care due to cost (2.35 (1.14,4.86)), compared with Chinese. Results among Filipinos were not statistically significant.

Conclusions. Among Asians living in the U.S. with cardiovascular risk factors or ASCVD, Asian Indians and Other Asians are more likely to report delayed care or no care due to cost compared with Chinese.

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INTRODUCTION

There is a high burden of ASCVD among Asian Americans. A prior study has shown that cardiovascular mortality rates in Asian Americans remained the same or, in the case of Asian Indian women, increased from 2003-2010, whereas the corresponding rates in non-Hispanic Whites decreased in that time period.¹ Studies also have shown heterogeneity in the prevalence of cardiovascular risk factors among various groups of Asian Americans residing in the U.S.^{2,3} It is, therefore, important to understand why Asian Americans, especially Asian Indians, have a higher risk of ASCVD.

Asian American is defined by the U.S. Federal Government as persons having origins in the original Far East, Southeast Asia, or the Indian subcontinent. Asians are the fastest-growing racial group in the U.S. and are projected to reach 40 million by the year 2050.⁴ Race-specific research among Asians living in the U.S. has been limited partly due to a lack of specificity of the term “Asian”.^{5,6} The U.S. Census Bureau defines Asian race if an individual traces their origins to the Far East, Southeast Asia, or the Indian subcontinent.

The higher risk of ASCVD among Asian Americans is multifactorial including a higher burden of cardiovascular risk factors as a result of changes in lifestyle habits due to acculturation to North American lifestyle, discrimination, delayed detection of risk factors or screening for subclinical disease, or underutilization of preventive therapy and treatment of risk factors due to lack of access to healthcare. Adequate access to healthcare is necessary to ensure screening for risk factors and initiation of appropriate preventive medical therapy. This is especially important among high-risk individuals such as those with existing ASCVD or a high burden of traditional cardiovascular risk factors such as hypertension or diabetes mellitus.⁷ As these individuals require longitudinal access to healthcare,⁸ it is important to identify barriers to receiving timely medical attention.⁹

While prior studies have examined measures related to healthcare access in the overall U.S. population^{10,11} and those with cardiovascular risk factors,¹² few have focused specifically on individuals of Asian descent.^{13,14} To address these knowledge gaps, the barriers to accessing healthcare among Asians living in the U.S. were examined, specifically among those with hypertension, diabetes mellitus, or ASCVD.

METHODS

Study Design and Population. The NHIS is a nationally representative health survey that has been conducted continuously since 1957 by the National Center for Health Statistics of the Centers for Disease Control and Prevention.¹⁵ It is the principal source of information on the health of the civilian, non-institutionalized population of the U.S. Our analysis included data from the 2006 to 2015 NHIS datasets. Detailed information on the cross-sectional survey design and methods

can be found at <http://www.cdc.gov/nchs/nhis.htm>. Individuals who self-identified as Asian were included and those with missing information on race were excluded. The study was exempt from Institutional Review Board approval since it utilized deidentified data from a publicly available dataset.

Dependent Variables. Barriers to healthcare access included the following items:

- 1) *No place to seek medical care when needed* was assessed using, “Is there a place that you usually go to when you are sick or need advice about your health?”
- 2) *No healthcare coverage* was assessed using, “Are you covered by any kind of health insurance or some other kind of health care plan (include health insurance obtained through employment or purchased directly, as well as government programs like Medicare and Medicaid that provide Medical care or help pay medical bills)?”
- 3) *No care due to cost* was assessed using, “During the past 12 months, was there any time when you needed medical care, but did not get it because you couldn’t afford it?”
- 4) *Delayed care due to cost* was assessed using, “During the past 12 months, have you delayed seeking medical care because of worry about the cost?”
- 5) *Inability to afford medication* was assessed using, “During the past 12 months, was there any time when you needed prescription medicines, but didn’t get it because you couldn’t afford it?”
- 6) *Did not see doctor in past 12 months* was assessed using, “During the past 12 months, have you seen or talked to any general doctor about your own health?”

Independent Variable. Asian race in NHIS was self-reported and was defined if participants identified themselves as Chinese, Filipinos, or Asian Indians. “Other Asians” included Japanese, Vietnamese, Korean, and other Asian subgroups.

Covariates. Demographic characteristics included age, gender, level of education (less than high school graduate, high school graduate, some college, and college graduate or above), country of birth, number of years lived in the U.S., and annual income (< \$25k, \$25-45k, \$45-75k, and > \$75k). Coronary heart disease (CHD) was defined if participants reported ever having angina pectoris, or being told they had CHD or a heart attack. Stroke was identified if participants reported ever being told they had a stroke. ASCVD was defined as a composite of CHD or stroke. Hypertension was defined if participants answered yes to the question: “Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?” Diabetes mellitus was defined by affirmative answer to the question: “Have you ever been told by a doctor or other health professional that you had diabetes?”. Smoking status was categorized as never versus ever depending on whether participants reported having smoked 100 cigarettes in a lifetime. Participants who answered yes were then asked if they now smoke every day, on some days, or not at all. Current smoking was defined as those who smoke every day or on some days, while former smoking was defined if they reported not smoking at all.

Statistical Analysis. Baseline characteristics were summarized using mean (standard error) and numbers (weighted percentages) and compared by Asian race group for both the overall study population and among those with ASCVD, hypertension, or diabetes mellitus. Multi-variable-adjusted logistic regression models were used to evaluate the association of Asian race categories (Chinese as reference given that they have a lower cardiovascular risk factor profile compared with other Asian groups¹⁶) and inability to access healthcare. Results were adjusted for age, gender, place of birth, education, and income and presented for the overall study population, then by restricting to individuals with self-reported ASCVD, diabetes mellitus, or hypertension. Sensitivity analyses further adjusted for comorbidity burden.

Sampling weights were used to produce national estimates that are representative of the civilian, noninstitutionalized U.S. population. These weights included design, ratio, non-response and post-stratification adjustments. Analyses were conducted using Stata version 16.1 (StataCorp, College Station, TX). A p value of < 0.05 was considered statistically significant.

RESULTS

The study sample was comprised of 18,150 Asian individuals, of whom 20.5% were Asian Indian, 20.5% were Chinese, 23.4% were Filipino, and 35.6% were classified as “Other Asians”. The mean (standard error) age was 43.8 (0.21) years, and 53% were women. Asian Indian individuals were younger, less likely to be women (46.8%), born in the U.S. (8.3%) or lived there for over 10 years (58%), have less than college education (28.6%), or an annual income < \$25k (28.6%). They also were less likely to smoke cigarettes currently (5.7%) or have hypertension (16.3%). The prevalence of current cigarette smoking, diabetes, hypertension, CHD, stroke, and ASCVD was highest among Filipinos (Table 1).

In the overall cohort, Asian Indians were more likely to report not having a place to seek medical care when needed and no healthcare coverage, but less likely to report no care or delayed care due to cost. Filipinos had highest prevalence of no healthcare coverage, no or delayed care due to cost, and inability to afford medications, while Chinese were most likely to not have seen a doctor in the past 12 months (all $p < 0.05$). Among individuals with ASCVD, diabetes, or hypertension, Asian Indians were more likely to report no place to seek medical care, absence of healthcare coverage, no care due to cost, and inability to afford medications, while Filipinos were more likely to report not seeing a doctor in the past 12 months (all $p < 0.05$; Table 2).

In adjusted analyses, Asian Indians were significantly more likely to report inability to afford medications compared with Chinese: odds ratio 2.11 (95% CI: 1.26,3.54). Filipinos were more likely to report inability to afford medications: 1.81 (1.12,2.91). Other Asians also were more likely to report no place to seek medical care: 1.35 (1.13,1.62), no healthcare coverage: 1.57 (1.28,1.94), no care due to cost: 1.61 (1.10,2.35), and inability to afford medications: 1.76 (1.14,2.74). Among individuals with self-reported ASCVD, diabetes, or hypertension, Asian Indians were more likely to report delayed care due to cost: 2.58 (1.14,5.85). Other Asians were more likely to report no care due to cost: 2.43 (1.09,5.44) or delayed care due to cost: 2.35 (1.14,4.86). Results for Filipinos were not statistically significant (Table 3). Further adjustment for comorbidity burden yielded similar results (not shown).

Table 1. Baseline characteristics of the study population in Asian individuals.

	Asian Indian (N = 3,392)	Chinese (N = 3,865)	Filipino (N = 4,170)	Other Asians (N = 6,723)	p Value
Current age, years (SE)	40.0 (0.4)	44.4 (0.5)	45.9 (0.3)	44.3 (0.3)	< 0.001
Women (%)	1,516 (46.8)	2,099 (54.7)	2,394 (55.0)	3,685 (53.3)	< 0.001
U.S. Birth (%)	307 (8.3)	831 (21.9)	1,496 (35.9)	1,965 (26.0)	< 0.001
Lived in U.S. >10 years (%)	1,624 (58.0)	2,002 (72.0)	2,085 (78.7)	3,526 (77.4)	< 0.001
Education less than college (%)	478 (15.9)	976 (25.5)	1,246 (27.7)	2,338 (34.0)	< 0.001
Income < \$25K (%)	574 (28.6)	706 (34.2)	800 (32.6)	1,225 (38.3)	< 0.001
Current cigarette smoking (%)	224 (5.7)	250 (9.2)	560 (17.1)	903 (14.1)	< 0.001
Diabetes mellitus (%)	255 (8.8)	193 (4.3)	448 (10.3)	530 (7.5)	< 0.001
Hypertension (%)	514 (16.3)	761 (18.5)	1,341 (31.0)	1,583 (20.7)	< 0.001
CHD (%)	96 (2.8)	127 (2.8)	220 (4.6)	242 (2.9)	< 0.001
Stroke (%)	30 (1.0)	55 (1.1)	84 (1.9)	133 (1.8)	0.01
ASCVD (%)	114 (3.4)	148 (3.1)	263 (5.5)	329 (4.1)	< 0.001

Abbreviations: CAD (coronary heart disease); ASCVD (atherosclerotic cardiovascular disease).
Continuous variables are summarized using mean (standard error) and categorical variables as count (weighted percentage).

Table 2. Healthcare access measures in the overall study population restricting to individuals with atherosclerotic cardiovascular disease, diabetes mellitus, or hypertension.*

	Overall (n = 18,150)					Individuals with Atherosclerotic Cardiovascular Disease, Diabetes Mellitus, or Hypertension (n = 4,829)				
	Asian Indian	Chinese	Filipino	Other Asians	p Value	Asian Indian	Chinese	Filipino	Other Asians	p Value
No place to seek medical care when needed (%)	712 (18.6)	651 (15.0)	584 (13.0)	1,328 (19.8)	< 0.001	73 (10.2)	49 (5.2)	101 (5.8)	139 (9.2)	< 0.001
No healthcare coverage (%)	383 (12.6)	435 (11.9)	577 (12.3)	1,123 (17.2)	< 0.001	74 (11.3)	63 (8.6)	127 (7.7)	165 (10.3)	0.15
No care due to cost (%)	131 (3.2)	138 (3.4)	230 (4.1)	386 (5.1)	< 0.001	44 (5.3)	33 (3.9)	95 (4.7)	110 (5.7)	0.45
Delayed care due to cost (%)	194 (4.4)	220 (5.1)	304 (6.1)	502 (6.4)	0.008	55 (6.8)	47 (4.9)	120 (6.8)	139 (7.6)	0.27
Inability to afford medication (%)	138 (4.3)	94 (2.6)	233 (5.1)	317 (4.6)	< 0.001	52 (7.1)	29 (3.6)	113 (7.0)	122 (7.1)	0.09
Did not see doctor in past 12 months	1,279 (36.6)	1,488 (37.4)	1,433 (33.6)	2,617 (40.5)	< 0.001	117 (16.9)	149 (17.8)	302 (18.1)	337 (20.0)	0.54

*Categorical variables are presented as count (weighted percentage).

Table 3. Odds ratios (95% confidence interval) for the association of Asian race and healthcare access overall and restricting to individuals with atherosclerotic cardiovascular disease, diabetes mellitus, or hypertension.

	Chinese	Asian Indian	Filipino	Other Asians	Asian Indian	Filipino	Other Asians
	Unadjusted				Adjusted		
Overall							
No place to seek medical care when needed (%)	1.00 (ref)	1.29 (1.10,1.52)	0.85 (0.71,1.00)	1.39 (1.22,1.59)	1.18 (0.96,1.46)	0.84 (0.67,1.07)	1.35 (1.13,1.62)
No healthcare coverage (%)	1.00 (ref)	1.07 (0.88,1.29)	1.03 (0.84,1.27)	1.54 (1.30,1.82)	1.25 (0.96,1.61)	1.11 (0.86,1.44)	1.57 (1.28,1.94)
No care due to cost	1.00 (ref)	0.92 (0.67,1.26)	1.21 (0.89,1.66)	1.51 (1.16,1.97)	1.13 (0.72,1.75)	1.12 (0.76,1.65)	1.61 (1.10,2.35)
Delayed care due to cost	1.00 (ref)	0.87 (0.68,1.13)	1.21 (0.94,1.56)	1.27 (1.01,1.58)	0.96 (0.67,1.37)	1.02 (0.75,1.39)	1.11 (0.85,1.46)
Inability to afford medication	1.00 (ref)	1.73 (1.24,2.42)	2.03 (1.47,2.81)	1.84 (1.34,2.54)	2.11 (1.26,3.54)	1.81 (1.12,2.91)	1.76 (1.14,2.74)
Did not see doctor in past 12 months	1.00 (ref)	1.04 (0.92,1.17)	1.18 (1.06,1.31)	0.88 (0.79,0.98)	1.13 (0.96,1.33)	1.10 (0.93,1.30)	0.84 (0.71,1.00)
Individuals with Atherosclerotic Cardiovascular Disease, Diabetes Mellitus, or Hypertension							
No place to seek medical care when needed (%)	1.00 (ref)	2.06 (1.31,3.23)	1.11 (0.72,1.74)	1.84 (1.17,2.88)	1.76 (0.90,3.45)	0.97 (0.49,1.91)	1.50 (0.79,2.81)
No healthcare coverage (%)	1.00 (ref)	1.35 (0.87,2.10)	0.89 (0.56,1.41)	1.22 (0.78,1.90)	0.99 (0.51,1.91)	0.83 (0.46,1.49)	1.18 (0.65,2.17)
No care due to cost	1.00 (ref)	1.36 (0.75,2.48)	1.22 (0.70,2.15)	1.48 (0.91,2.43)	4.15 (0.74,4.09)	1.74 (0.74,4.09)	2.43 (1.09,5.44)
Delayed care due to cost	1.00 (ref)	1.43 (0.84,2.41)	1.41 (0.88,2.27)	1.59 (1.04,2.45)	2.58 (1.14,5.85)	1.52 (0.73,3.18)	2.35 (1.14,4.86)
Inability to afford medication	1.00 (ref)	2.05 (1.21,3.32)	2.00 (1.21,3.32)	2.05 (1.26,3.32)	2.16 (0.85,5.50)	1.83 (0.84,4.01)	1.79 (0.83,3.84)
Did not see doctor in past 12 months	1.00 (ref)	1.06 (0.76,1.49)	0.98 (0.72,1.32)	0.87 (0.66,1.14)	1.14 (0.70,1.86)	1.15 (0.72,1.84)	0.97 (0.65,1.43)

Results are adjusted for age, gender, place of birth, education, and income. Bolded items are statistically significant.

DISCUSSION

In a contemporary and representative sample of individuals of Asian descent living in the U.S., Asian Indians and Other Asians with a high burden of cardiovascular disease were more likely to suffer more from cost-related healthcare access measures compared with Chinese.

A prior study using data from the Kaiser Family Foundation found that nearly 18% of Asian Americans were uninsured.¹⁷ However, there is heterogeneity in health insurance among Asian Americans. According to data from the Commonwealth Fund 2001 Health Care Quality Survey, Korean Americans were the most likely to be uninsured (55%) followed by 37% of Vietnamese, 18% of Asian Indians, 16% of Chinese, 15% of Filipinos, and 4% of Japanese.¹⁸ However, factors beyond insurance also may compromise access to healthcare. Lee et al.¹⁹ performed an in-depth analysis of healthcare access in among Asian Americans and identified several challenges. The major barriers to healthcare access included financial (lack of insurance or gaps in coverage, expensive out of pocket payments), physical (lack of transportation or scheduling conflicts), communication (language barriers and health literacy), and cultural attitudes towards health and healthcare (medical care not being a cultural norm, barriers unique to women, and strong preference for Asian physicians). Furthermore, a majority of Asian Americans tended to utilize complementary and alternative medicine as opposed

to Western medicine. These barriers also represented opportunities for improving access to healthcare among Asian Americans.

Healthcare delivery is a multistep process that involves obtaining healthcare coverage, finding a place where medical services are provided, and subsequently, being able to afford medical bills and, if necessary, pharmacotherapy. It is important to evaluate these different facets of healthcare access each of which may constitute a barrier to receiving adequate and timely medical care especially among high-risk individuals. As Asian Americans represent a heterogeneous group of individuals, culturally tailored interventions will be needed to address healthcare disparities. Effort especially must be expended to find providers who are able to speak their patient's language.²⁰ Increasing Asian multicultural and multilingual competency training and awareness of unique health needs among non-Asian clinicians also may improve healthcare access.²⁰⁻²² Improving health literacy and emphasizing the importance of preventive care also may increase the likelihood of Asian Americans seeking medical care. It is also important to help patients navigate the healthcare system, finding an adequate provider, and being able to pay medical bills.²³ This multipronged approach may mitigate some health disparities among Asian Americans, especially those who are high-risk.

In the present analysis of individuals with history of ASCVD, diabetes mellitus or hypertension, Asian Indians were more likely to report

delayed care due to cost even after adjusting for sociodemographic factors. However, it is unclear why cost remains a barrier among Asian Indians despite having comparable rates of healthcare coverage and higher educational attainment and income compared with other Asian groups. Although our analyses adjusted for age, there may be residual confounding from factors that our study did not account for. Asian Indians represented the youngest age group in this study. The authors surmised that younger people may be more likely to face financial pressures leading to actual or perceived lack of disposable funds to afford healthcare such as: 1) investing in education for their children or contributing towards their parents' retirement; or 2) sending remittances via formal channels back to their home country. Second, larger nuclear families (multi-generation home including children, parents, and grandparents) may lead to higher net family expenses despite higher income leading to a perception of an inability to afford healthcare. Third, there may be cultural issues related to how Asian Indians perceive cost as a barrier to accessing healthcare. Although some of these reasons were posited, elucidating causes underlying this disparity among Asian Indians compared with other Asian groups will require further qualitative work.²⁴ "Other Asians" also had a higher risk of no care or delayed care due to cost. As Other Asians in our study represented a heterogeneous group of individuals from Japan, Vietnam, or Korea, it is important for future studies to include these groups specifically to identify which group is disproportionately susceptible to lack of healthcare access.

Our results should be interpreted in the context of important limitations. All of our variables were self-reported and may be prone to measurement error and recall bias. NHIS may not have captured all reasons for difficulty accessing medical care, which may have underestimated its true prevalence among Asians living in the U.S. Small sample size likely underpowered our analyses to detect significant differences among Asian groups, especially in those with ASCVD or cardiovascular risk factors. We did not assess when participants immigrated to the U.S. The Naturalization Act of 1965 essentially allowed only the educated to enter the U.S. initially. Hence, early wave immigrants were able to accumulate wealth and become well acculturated into American society. Thereafter, laws were relaxed, allowing families to reunite (parents and spouses and perhaps not given the advantage of higher education). We also did not assess birth country among Asian Indians which may be important given that ASCVD risk varies by country of origin. Lastly, there is the possibility of residual confounding in this epidemiologic cohort study.

In conclusion, among Asians living in the U.S. with cardiovascular risk factors or ASCVD, Asian Indians and Other Asians were more likely to report delayed care or no care due to cost compared with Chinese.

REFERENCES

- 1 Jose PO, Frank ATH, Kapphahn KI, et al. Cardiovascular disease mortality in Asian Americans. *J Am Coll Cardiol* 2014; 64(23):2486-2494. PMID: 25500233.
- 2 de Souza RJ, Anand SS. Cardiovascular disease in Asian Americans: Unmasking heterogeneity. *J Am Coll Cardiol* 2014; 64:2495-2497. PMID: 25500234.
- 3 Nadimpalli SB, Dulin-Keita A, Salas C, Kanaya AM, Kandula NR. Associations between discrimination and cardiovascular health among Asian Indians in the United States. *J Immigr Minor Heal* 2016; 18(6):1284-1291. PMID: 27039100.
- 4 U.S. Census Bureau. Facts for Features: Asian-American Heritage Month: April 29, 2011. https://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb11-ff06.html. Accessed May 18, 2022.
- 5 Wang EJ, Wong EC, Dixit AA, Fortmann SP, Linde RB, Palaniappan LP. Type 2 diabetes: Identifying high risk Asian American subgroups in a clinical population. *Diabetes Res Clin Pract* 2011; 93(2):248-254. PMID: 21665315.
- 6 Palaniappan L, Wang Y, Fortmann SP. Coronary heart disease mortality for six ethnic groups in California, 1990-2000. *Ann Epidemiol* 2004; 14(7):499-506. PMID: 15310526.
- 7 Benjamin EJ, Virani SS, Callaway CW, et al. Heart disease and stroke statistics-2018 update: A report from the American Heart Association. *Circulation* 2018; 137:e67-492. PMID: 29386200.
- 8 Khera A, Baum SJ, Gluckman TJ, et al. Continuity of care and outpatient management for patients with and at high risk for cardiovascular disease during the COVID-19 pandemic: A scientific statement from the American Society for Preventive Cardiology. *Am J Prev Cardiol* 2020; 1:100009. PMID: 32835347.
- 9 Kangovi S, Barg FK, Carter T, Long JA, Shannon R, Grande D. Understanding why patients of low socioeconomic status prefer hospitals over ambulatory care. *Health Aff* 2013; 32(7):1196-1203. PMID: 23836734
- 10 Okoro CA, Zhao G, Fox JB, Eke PI, Greenlund KJ, Town M. Surveillance for health care access and health services use, adults aged 18-64 years - Behavioral Risk Factor Surveillance System, United States, 2014. *MMWR Surveill Summ* 2017; 66(7):1-42. PMID: 28231239.
- 11 Al Rifai M, Mahtta D, Kherallah R, et al. Prevalence and determinants of difficulty in accessing medical care in U.S. adults. *Am J Prev Med* 2021; 61(4):492-500. PMID: 34229931.
- 12 Fang J, Yang Q, Ayala C, Loustalot F. Disparities in access to care among US adults with self-reported hypertension. *Am J Hypertens* 2014; 27(11):1377-1386. PMID: 24847953.
- 13 Liao Y, Bang D, Cosgrove S, et al. Surveillance of health status in minority communities - Racial and Ethnic approaches to Community Health across the U.S. (REACH U.S.) Risk Factor Survey, United States, 2009. *MMWR Surveill Summ* 2011; 60(6):1-44. PMID: 21597458.
- 14 Tan C, Wyatt LC, Kranick JA, Kwon SC, Oyebo O. Factors associated with health insurance status in an Asian American population in New York City: Analysis of a community-based survey. *J Racial Ethn Health Disparities* 2018; 5(6):1354-1364. PMID: 29582383.
- 15 National Center for Health Statistics. National Health Interview Survey (NHIS). May 16, 2022. <https://www.cdc.gov/nchs/nhis/index.htm>. Accessed May 18, 2022.
- 16 Satish P, Sadaf MI, Valero-Elizondo J, et al. Heterogeneity in cardio-metabolic risk factors and atherosclerotic cardiovascular disease among Asian groups in the United States. *Am J Prev Cardiol* 2021; 7:100219. PMID: 34611645.
- 17 Kaiser Family Foundation. Health Coverage by Race and Ethnicity: The Potential Impact of the Affordable Care Act. March 13, 2013. <https://www.kff.org/racial-equity-and-health-policy/issue-brief/health-coverage-by-race-and-ethnicity-the-potential-impact-of-the-affordable-care-act/#:~:text=Across racial and ethnic groups,have done so for adults>.
- 18 The Commonwealth Fund. 2001 Health Care Quality Survey. March 1, 2002. <https://www.commonwealthfund.org/publications/surveys/2002/mar/2001-health-care-quality-survey>. Accessed May 18, 2022.
- 19 Lee S, Martinez G, Ma GX, et al. Barriers to health care access in 13 Asian American communities. *Am J Health Behav* 2010; 34(1):21-30. PMID: 19663748.
- 20 Jenkins CN, Le T, McPhee SJ, Stewart S, Ha NT. Health care access and preventive care among Vietnamese immigrants: Do traditional beliefs and practices pose barriers? *Soc Sci Med* 1996; 43(7):1049-1056. PMID: 8890405.
- 21 Carey Jackson J, Taylor VM, Chitnarong K, et al. Development of a cervical cancer control intervention program for Cambodian American women. *J Community Health* 2000; 25(5):359-375. PMID: 10982010.
- 22 Han Y, Williams RD, Harrison RA. Breast cancer screening knowledge, attitudes, and practices among Korean American women. *Oncol Nurs Forum* 2000; 27(10):1585-1591.

²³ Xueqin Ma G, Du C. Culturally competent home health service delivery for Asian Americans. *Home Health Care Manag Pract* 2000; 12(5):16-24.

²⁴ Gupta R, Gupta VP, Sarna M, et al. Prevalence of coronary heart disease and risk factors in an urban Indian population: Jaipur Heart Watch-2. *Indian Heart J* 2002; 54(1):59-66. PMID: 11999090.

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