

*Arthur L. Klatsky, MD  
Irene S. Tekawa, MA  
Mary Anne Armstrong, MA*

Arthur L. Klatsky is with the Division of Cardiology, Department of Medicine, Kaiser Permanente Medical Center; Irene S. Tekawa and Mary Anne Armstrong are Biostatisticians with the Division of Research, Kaiser Permanente Medical Care Program, Oakland, California.

*Tearsheet requests to Irene S. Tekawa, The Permanente Medical Group, Inc., Division of Research, 3505 Broadway, Oakland, CA 94611; tel. 510-450-2102; fax 510-450-2072.*

## Cardiovascular Risk Factors among Asian Americans

---

### SYNOPSIS

---

MANY ASIANS HAVE RECENTLY IMMIGRATED to the United States, but there have been few studies of cardiovascular risk factors in these groups. Researchers analyzed data from 13,031 people who described themselves as Chinese, Filipino, Japanese, and other Asians, and used regression analyses controlled for age, alcohol use, education, and marital status.

Adjusted mean body mass index and smoking prevalence were lowest in Chinese men and women. Adjusted total cholesterol levels were highest in Japanese men and women. Hypertension prevalence was highest in Filipino men and women.

Comparisons of Asians born outside the United States with those U.S.-born showed 1) no major cholesterol differences; 2) higher body mass index in U.S.-born men, but not in women of most races; 3) more hypertension only in U.S.-born Chinese men; and 4) a lower smoking prevalence in U.S.-born men but generally higher smoking prevalence in U.S.-born women. These data show important ethnic differences in cardiovascular risk factors among Asian Americans and have implications for targeting public health efforts.

**A** marked acceleration of immigration to the United States from Asian countries since the 1960s (1,2) has increased the Asian American population from 1.5 million in 1970 to 7.3 million in 1990 (3). Coronary heart disease is one of the leading causes of death among Asian Americans (4). However, there are few reports about cardiovascular risk factors and disease incidence in this population. A considerable concentration of Asian Americans in the San Francisco Bay area provided an opportunity to study cardiovascular risk factors among various Asian groups.

### Methods

We examined data from 13,031 Asian Americans who voluntarily took routine health examinations at a northern California prepaid health care program during 1978 through 1985. The examination included a detailed medical history, a number of health measurements including laboratory tests, and a follow-up physical examination. Examinees were asked not to eat for at least 4 hours before the appointment. The query "What is your

race?" on the questionnaire identified 5951 Chinese, 4211 Filipinos, 1703 Japanese, and 1166 other Asians, and birthplace was determined by the query "Where were you born?" (Table 1) A previous description has been published (5). The mean age was 38.6, with 44% men and 56% women.

We used multiple regression analysis to determine adjusted means for body mass index (BMI), systolic and diastolic blood pressure, total cholesterol, and glucose for each ethnic group, controlling for age, marital status, education, alcohol use, and body mass index (except when the dependent variable was body mass index). We used logistic regression to determine odds ratios (ORs) for risk factors: high body mass index ( $\geq 24.4$  kg/m<sup>2</sup>), hypertension ( $\geq 140/90$  mmHg or on treatment); high cholesterol ( $\geq 6.21$  mmol/l or 240 mg/dL); high glucose ( $\geq 6.11$  mmol/L or 110 mg/dL); and current cigarette smoking, comparing each ethnic group with the largest group, Chinese. The same covariates were used in the logistic models.

We also studied the relationship of birthplace to risk factors within each ethnic group, with birthplace as an additional covariate and country of ethnic origin as the reference group. Thus, for Chinese Americans, the reference group consisted of those born in mainland China; for Japanese Americans, those born in Japan; for Filipino Americans, those born in the Philippines. For the other Asian group, we compared all individuals born in the United States with those born in all other Asian countries combined. All analyses were performed separately by gender.

## Results

Filipino men and women had the highest prevalence of hypertension with higher risk compared with the Chinese group (OR in contrast to Chinese men=1.3; 95% CI=1.0, 1.6 and OR in contrast to Chinese women=1.5; 95% CI=1.2, 1.9). Only in Chinese men and other Asian men was continental U.S. birthplace (excluding those born in Hawaii) associated with more hypertension.

Chinese men and women had the lowest adjusted mean BMI. Adjusted ORs for high BMI for the Japanese, Filipino, and other Asian groups, in contrast to the Chinese, were all significantly greater than one ( $P < 0.001$ ), ranging from 1.4 for Japanese women to 2.7 for Filipino women. U.S.-born Asian-American men of all races compared to their foreign-born counterparts were more likely to have high BMI; adjusted ORs ranged from 1.6 for Chinese men to 3.0 for Japanese men. This difference in BMI by birthplace did not hold true for Asian-American women, except among other Asians.

Adjusted total cholesterol levels were highest in Japanese men and women and lowest in other Asians. Compared with the Chinese reference group, only Japanese men and women had increased ORs for high

**Table 1. Traits of persons in Asian-American ethnic groups by gender**

	Chinese	Filipino	Japanese	Other Asian
Men (n)	2754 (48.2)	1729 (30.3)	688 (12.0)	543 (9.5)
Women (n)	3197 (43.7)	2482 (33.9)	1015 (13.9)	623 (8.5)
% Born in United States				
Men	41.4	8.2	84.9	7.0
Women	44.2	8.5	75.5	10.4
% Age <45				
Men	62.5	70.6	56.4	81.4
Women	67.0	75.0	57.3	84.1
% Blood Pressure $\geq 140/90$ mmHg or Receiving Treatment for Hypertension				
Men				
<45	2.9	5.5	3.9	3.5
$\geq 45$	23.1	28.3	24.6	19.4
Women				
<45	1.6	4.2	1.4	3.1
$\geq 45$	20.9	25.5	18.7	17.7

cholesterol (OR in contrast to Chinese men=1.3; 95% CI=1.1, 1.6. OR in contrast to Chinese women=1.5; 95% CI=1.2, 1.8). We found no significant differences in cholesterol levels within ethnic groups by birthplace.

Chinese men and women were least likely to smoke. Comparing other groups with the Chinese, adjusted ORs for current smoking were all significantly greater than one, ranging from 1.4 for Japanese men to 2.3 for Filipino men and Japanese women. Comparison of current smoking within groups by birthplace revealed that men born in the United States were less likely to smoke than their counterparts born in Asia, and except for Japanese, women born in the United States were more likely to smoke.

## Discussion

We found differences in cardiovascular risk factors between various groups of Asian Americans and within groups depending on birthplace. When studying a disease, it is therefore important to consider ethnicity and variables such as birthplace that may indicate lifestyle differences. Of the Asian ethnic groups in the study, Chinese Americans were less likely to have high levels of the risk factors examined. More detailed results for cardiovascular risk factor comparison with those born in the United States compared with those born in Asia have been reported (6). In another report (7), researchers noted an increased risk of hypertension among Filipinos.

As a result of this research, we suggest target areas for preventive cardiology efforts: 1) the greater risk of hypertension in Filipino Americans compared with the risks of other Asian Americans, 2) a higher prevalence of smoking among Asian-American women born in the United States compared with the prevalence among their Asian-born counterparts, and 3) weight control in the U.S.-born Asian-American men.

## References

1. Lin-Fu, J. S.: Population characteristics and health care needs of Asian Pacific Americans. *Public Health Rep* 103: 18–28 (1988).
2. Gardner, R. W., Robey, B., and Smith, P. C.: Asian Americans: growth, changes, and diversity. *Population Bull* 40(4). Population Reference Bureau, Washington, DC, 1985.
3. U. S. Bureau of the Census: *Statistical Abstract of the United States*, 110th ed., U.S. Government Printing Office, Washington, DC, 1990.
4. National Center for Health Statistics: *Health United States—1990*. Publication No. (PHS) 91-50213. U.S. Government Printing Office, Washington, DC, 1991, pp. 80–82.
5. Angel, A., Armstrong, M. A., and Klatsky A. L.: Blood pressure among Asian-Americans living in northern California. *Am J Cardiol* 64: 237–240 (1984).
6. Klatsky, A. L., and Armstrong, M. A.: Cardiovascular risk factors among Asian Americans living in northern California. *Am J Public Health* 81: 1423–1428 (1991).
7. Stavig, G. R., Igra, A., and Leonard, A. R.: Hypertension among Asians and Pacific Islanders in California. *Am J Epidemiol* 119: 677–691 (1984).