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# Health Status and Health Services Utilization Among US Chinese, Asian Indian, Filipino, and Other Asian/Pacific Islander Children

Stella M. Yu, ScD, MPH\*; Zhihuan J. Huang, MB, PhD, MPH\*; and Gopal K. Singh, PhD‡

**ABSTRACT.** *Objective.* This study examines the health status and health services access and utilization characteristics of US Chinese, Asian Indian, Filipino, other Asian/Pacific Islander (API), and non-Hispanic white children by using nationally representative data.

*Methods.* We analyzed the aggregated data file from the National Health Interview Survey from 1997 to 2000 including 334 Chinese, 287 Asian Indian, 292 Filipino, 696 "other API," and 29 016 non-Hispanic white children <18 years old. Bivariate and multivariate analyses were conducted to examine the relationship between Asian ethnicities and dependent variables including components of health status, health services access, and utilization.

*Results.* Logistic regression reveals that all Asian American children were less likely to miss school because of illness or injury or have learning disabilities compared with non-Hispanic whites. Other APIs were less likely to be taking prescription medication for at least 3 months, and Asian Indian children were half as likely to have chronic conditions. Chinese, Filipino, and other API children were more likely to be without contact with a health professional within the past 12 months. Citizenship/nativity status, maternal education attainment, and poverty status were all significant independent risk factors for health care access and utilization.

*Conclusions.* Asian ethnicities and being foreign-born are generally associated with more favorable health status measures such as school absence, learning disability, use of prescription medications, and chronic conditions. However, these attributes are negatively associated with health care access and utilization, suggesting the need for outreach to Asian immigrant populations to educate them on accessing the US health care system. *Pediatrics* 2004;113:101–107; *child, Asian American children, immigrants, health status, health services access and utilization.*

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ABBREVIATIONS. API, Asian/Pacific Islander; NHIS, National Health Interview Survey; OR, odds ratio; CI, confidence interval.

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It has been widely documented that US minority children experience poorer access to health care than non-Hispanic white children.<sup>1</sup> Most studies on health care access have focused on Hispanic and African American children.<sup>2–5</sup> There is a lack of information on health status, health care access, and health services utilization among Asian American children, although the 2000 US Census indicates that people of Asian descent represented 4.2% of the US population, a 48.3% increase from 1990.<sup>6</sup> Chinese, Filipino, and Asian Indians are the 3 largest Asian American subgroups in the United States, comprising 23.7%, 18.1%, and 16.4% of the total Asian population, respectively.<sup>6</sup> Of nearly 12 million Americans who report themselves to be of Asian descent (either alone or in combination with other races), at least 3 million are <18 years old.<sup>7</sup> The 2000 Current Population Survey data indicate that 1 in 6 children lives with a foreign-born householder, although most of these children are US-born. Children living with foreign-born householders tend to be younger and are more likely to live in poverty than those living with US-born householders.<sup>8</sup>

Among many health issues faced by immigrants, those related to health care access and insurance are the most challenging.<sup>9–13</sup> Studies have reported lower mortality and morbidity risks among immigrants than US-born infants, children, and adults.<sup>14–19</sup> Additionally, child and parental birthplace have been found to affect insurance status and access to health services among Hispanic children in the United States.<sup>3</sup> The joint effect of being foreign-born and lacking health insurance among the poor has also been associated with a severe lack of a usual source of care.<sup>20</sup>

For Asian children, health issues are compounded by the problem of adaptation to a new culture, particularly for children with limited English proficiency.<sup>21,22</sup> Even in Canada, where health insurance is universal, new immigrants lack access to formal and informal support to help them use services effectively, and this access is linked to linguistic isolation.<sup>23</sup> Asian children have been shown to receive the lowest quality of primary care compared with other ethnic groups.<sup>24</sup> Moreover, these children's parents are limited in their ability to act as advocates for their children in the health care setting.<sup>25,26</sup> A recent study on Asian adolescents revealed significant psychosocial deficits in the school environment and a lack of parental support among those whose primary language at home is not English.<sup>27</sup> These psychosocial,

educational, and family risk factors are important elements of child and adolescent well-being.

Recent studies on Asian adult populations have articulated the health needs of Asian/Pacific Islander (API) women<sup>28</sup> and effects of institutional and individual discrimination on the health status of Chinese Americans.<sup>29</sup> There is a relative lack of studies that focus on disaggregated Asian subgroups, especially on populations that have arrived more recently. Studies on prenatal care utilization and health of adult immigrants have demonstrated substantial heterogeneity among Asian ethnic groups.<sup>30,31</sup> Most recent national surveys on children and adolescents do not collect data on Asian ethnicities.<sup>32–34</sup>

To our knowledge, no study has examined the health status and health care characteristics of children of specific Asian American subgroups. By using 4 years of aggregated data from the National Health Interview Survey (NHIS; 1997–2000), this study 1) describes the prevalence of health status and health services indicators among Chinese, Asian Indian, Filipino, and other API children and 2) examines the effects of socioeconomic and demographic factors such as race/ethnicity, child's age, gender, citizenship/nativity, and poverty status, and maternal education on health status, health care access, and health services utilization.

## METHODS

### Data

The data used in this study are primarily derived from the basic module of the NHIS from 1997 through 2000. The NHIS, a multi-purpose health survey, is conducted by the National Center for Health Statistics, Centers for Disease Control and Prevention, and is the principal source of information on the health of the civilian, noninstitutionalized population of the United States.<sup>35</sup> The NHIS uses a multistage sampling method and collects data by computer-assisted personal interviewing with household adult respondents.

From each family in the NHIS, 1 sample adult and 1 sample child are selected randomly, and information on each is collected with the Sample Adult Core and the Sample Child Core questionnaires. More details of NHIS can be found in other publications.<sup>36</sup>

The information needed to examine the above research questions is contained in 3 data files in each year's NHIS survey data. The Sample Child data provide health care access and utilization measures. It was the primary data set, and its unit, each child, was the unit of our analysis. Information on family resources and demographic characteristics was recorded in the Family file. Information on children's and parents' citizenship, education, and health insurance status was found in the Person file. Certain covariates such as the child's age, gender, race, and parental education were also collected from the Sample Child data and Person data. Merging the 3 data sets by personal ID (Household ID + Family ID + Child ID), a "master" data file was created with linked child, mother, and father information from each year's NHIS data.

Finally, 4 years of data (1997–2000) were aggregated to yield sufficient statistical power to explore the health status and health services characteristics among specific Asian American subgroups. The comparison group was the non-Hispanic white population of the same time period. Estimates were weighed to represent all US non-Hispanic white and Asian children <18 years old.

### Measures

The measures of health status included questions that asked: whether the respondent would say that the subject's health is excellent, very good, good, fair, or poor; whether a chronic condition existed in the last 12 months (respiratory allergy, skin allergy, food allergy, repeated diarrhea, anemia, and hay fever);

whether days of school were missed because of injury or illness; whether the child has a problem for which he/she has regularly taken prescribed medication for the last 3 months; and whether the respondent has had a school or health professional ever tell him/her that the child has a learning disability. The measures of health care access and utilization were based on whether: the child had health care coverage at the time of interview under private, Medicare, Medicaid, the State Children's Health Insurance Program (SCHIP), a state or government program, or military health program; there is a place that the respondent would take the child when he/she is sick or call when in need for advice on his/her health; in the past 12 months, the respondent has ever talked to a general doctor about the child's health; and, during the past 12 months, the child has had a well-child care/check-up. All these measures were recoded as dichotomized outcomes.

The covariates included the child's race/ethnicity, age, gender, citizenship/nativity status, maternal education, poverty status, and insurance status. Poverty status is a variable created from family income and family size by using the US Census Bureau's poverty thresholds.<sup>37</sup> Children in families below the poverty threshold are coded as "poor"; children in families with income 100% to <200% of the poverty threshold were coded as "near poor"; and children in families  $\geq$ 200% the poverty threshold were coded as "not poor."

The Asian American ethnic groups identified in the NHIS included Chinese, Asian Indians, Filipinos, and other APIs. The category "other API" includes Korean, Vietnamese, Japanese, Cambodian, Hawaiian, and other Asian/Pacific subgroups.

### Statistical Methods

$\chi^2$  statistics were used to test for differences in the proportion of negative health status indicators and health access and utilization factors among ethnic groups. Logistic regression analyses were used to examine the independent effects of socioeconomic and demographic characteristics on various outcomes. Covariates were selected based on significant associations identified in bivariate analyses. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were computed by using the regression ( $\beta$ ) coefficients, and standard errors were obtained from the logistic regression models.

To account for the complex sample design involving stratification, clustering, and multistage sampling of the NHIS, Software for the Statistical Analysis of Correlated DATA (SUDAAN) was used to conduct the statistical analyses.<sup>38</sup> Taylor-series linearization methods were applied for variance estimation as recommended. Because the Sample Child file was the primary data set, the Sample Child weight, which includes design, ratio, nonresponse, and poststratification adjustments for sample children, was used as the weight for all analyses. The final weight for the pooled multiyear data was calculated as the mean of the 4 years' weights.

## RESULTS

Table 1 shows the demographic distributions of the index children by ethnicity. There were 334 Chinese, 287 Asian Indian, 292 Filipino, and 696 other API children. The comparison group consisted of 29 016 non-Hispanic white children. Significant associations were found between ethnic groups and most sociodemographic characteristics examined ( $\chi^2$   $P$  value < .05). Among children, Asian Indians and other APIs have the highest percentage of noncitizens and foreign-born children. Poverty status varies substantially among the ethnic groups; Asian Indian and other API children have the highest poverty rates. More than a quarter of API children are classified as poor. Few Asian American children reside in nonmetropolitan statistical area compared with non-Hispanic white children. More than half of Chinese, Filipino, and Asian Indian mothers have at least a college degree. Asian Indian children have the highest proportion of same-race parents as well as

**TABLE 1.** Sociodemographic Characteristics of Asian American and Pacific Islander Children (United States, 1997–2000)

	Non-Hispanic White		Chinese		Filipino		Asian Indian		Other API	
	%	SE	%	SE	%	SE	%	SE	%	SE
Age, y										
0–4	31.8	0.3	37.3	3.0	38.6	3.2	34.1	3.2	33.9	2.2
5–11	34.5	0.3	30.2	3.0	31.2	3.3	32.1	3.3	31.3	2.3
12–17	33.7	0.3	32.5	3.3	30.3	2.6	33.9	3.1	34.8	2.1
Gender										
Male	51.3	0.3	51.1	3.1	48.3	3.7	47.2	3.1	52.4	2.3
Female	48.7	0.3	48.9	3.1	51.7	3.7	52.8	3.1	47.6	2.3
Citizenship/nativity										
US-born citizen	98.7	0.1	83.2	2.4	85.2	2.7	74.8	3.2	79.6	1.9
Naturalized citizen	0.6	0.1	4.4	1.3	5.3	1.5	2.7	1.2	6.2	1.1
Non-US citizen	0.7	0.1	12.5	2.1	9.6	2.2	22.5	3.1	14.3	1.6
Poverty status										
Poor	9.5	0.3	7.8	1.8	6.0	2.0	12.6	2.8	26.3	2.9
Near poor	18.6	0.4	14.1	2.6	13.8	2.7	17.9	3.1	17.5	2.0
Not poor	71.9	0.5	78.1	3.4	80.3	3.6	69.5	3.5	56.3	3.0
Place of residence										
Nonmetropolitan statistical area	25.1	0.6	3.2	1.0	2.9	1.7	4.9	1.4	6.0	1.9
Metropolitan statistical area	74.9	0.6	96.8	1.0	97.1	1.7	95.1	1.4	94.0	1.9
Region of residence										
Northeast	20.2	0.5	29.3	3.9	14.7	3.8	38.5	3.9	15.4	1.8
Midwest	30.9	0.6	10.7	2.1	8.7	2.0	19.8	3.2	20.3	2.8
South	32.5	0.6	14.9	2.6	8.2	2.1	21.0	2.6	19.1	2.3
West	16.5	0.5	45.2	3.9	68.4	4.3	20.7	3.1	45.1	3.3
Mother's education										
Less than high school	9.1	0.3	14.1	2.5	4.5	1.4	9.5	1.9	28.1	3.2
High school graduate	29.9	0.4	17.5	2.5	10.9	2.1	14.5	2.5	25.6	2.3
Some college	33.7	0.4	16.7	2.4	29.7	3.6	18.7	3.0	18.8	2.0
College graduate	27.3	0.4	51.8	3.7	54.9	3.9	57.3	3.7	27.5	2.5
Other parental characteristics										
Parents same race/ethnicity	96.4	0.1	89.7	1.8	85.4	2.9	96.2	1.0	87.5	1.8
Both parents foreign-born	2.3	0.1	75.7	2.9	79.0	3.6	95.8	1.2	72.1	2.8
Neither parent is US citizen	1.3	0.1	29.0	3.7	19.1	4.2	43.2	4.1	38.2	3.1
At least one parent lacks health insurance	37.1	0.4	36.3	2.9	33.7	3.3	33.3	3.1	42.5	2.5
At least one parent had physical limitation	12.6	0.3	4.1	1.3	6.1	1.8	6.1	1.8	12.0	2.0
N (unweighted)	29 016		334		292		287		696	

SE indicates standard error of the mean.

parents that were foreign-born. Asian Indians and other APIs have the highest percentage of noncitizen parents. The parents of other APIs have the highest

percentage of not having health insurance; they also have a higher percentage of physical limitations than other Asian ethnicities.

**TABLE 2.** Health Status and Health Services Utilization Characteristics of Asian American and Pacific Islander Children (United States, 1997–2000)

	Non-Hispanic White		Chinese		Filipino		Asian Indian		Other API		P value*
	%	SE	%	SE	%	SE	%	SE	%	SE	
Health status											
Respondent assessed fair/poor health	1.2	0.1	0.5	0.3	0.6	0.5	0.1	0.1	1.2	0.4	<.001
Congenital diseases	2.9	0.1	0.9	0.5	2.5	1.0	1.8	1.0	0.6	0.2	<.001
Reported chronic conditions	26.5	0.3	22.9	2.9	21.3	3.1	15.1	2.4	20.9	1.9	<.001
Missing school because of illness or injury within 12 months (5–17 years)	84.0	0.3	74.8	2.7	68.5	3.2	67.2	3.4	70.3	2.2	<.001
Unable to crawl/walk because of impairment	2.2	0.1	1.0	0.5	0.5	0.4	1.5	0.8	1.2	0.6	.001
Having a problem for which prescription medication had been taken regularly for at least 3 months	11.3	0.2	5.5	1.5	5.0	1.7	4.9	1.2	5.4	1.1	<.001
Told to have had a learning disability (3–17 years)	8.0	0.2	1.3	0.7	3.0	1.4	0.8	0.5	1.9	0.8	<.001
Health services access and utilization											
Without health insurance at time of interview	8.4	0.2	11.3	2.0	7.0	1.6	14.9	2.3	13.9	1.6	.001
Without contact with a doctor or health professional in past 12 months	19.3	0.3	24.4	2.7	28.1	2.7	28.1	2.9	26.2	2.1	<.001
Without a check-up in past 12 months	27.0	0.4	29.1	3.0	26.4	3.0	26.1	2.8	30.3	2.0	.481
Delayed seeking health care because of cost	7.3	0.2	8.6	2.1	10.0	1.9	6.2	1.6	7.2	1.2	.550
Without a usual place for health care	1.7	0.1	3.8	1.4	3.6	1.5	1.9	1.3	6.3	1.1	<.001

SE indicates standard error of the mean.

\*  $\chi^2$  test for testing the overall association between race/ethnicity and each health status or health services outcome.

Table 2 shows the children's health status and health care access and utilization by ethnicity. In general, Asian American children had a lower prevalence of congenital diseases and chronic conditions compared with non-Hispanic whites. Of all the ethnic groups, Asian Indian children had the lowest percentage of chronic conditions. Compared with non-Hispanic whites, all Asian American children were half as likely to report having a problem for which prescription medication had been taken regularly for at least 3 months as well as a much lower rate of reported learning disabilities and physical limitations (unable to crawl or walk because of impairment). Asian American children were also less likely to miss school because of illness or injury compared with non-Hispanic whites. Moreover, Chinese, Filipino, and particularly Asian Indian children, were less likely to report being in fair/poor health compared with the other API and non-Hispanic white children.

With respect to health care access, Chinese, Asian Indian, and other API children were more likely to be without health insurance at the time of the interview compared with non-Hispanic whites. All Asian American children were more likely to be without a usual place for health care and to report no contact with a health professional within the past 12 months compared with non-Hispanic whites. The ethnic groups did not differ in attending well-child visits within the past 12 months and reporting delay for seeking health care because of cost.

Table 3 shows the ORs from logistic regressions for both health status and health services indicators while controlling for children's race/ethnicity, age, gender, citizenship/nativity status, maternal education, and family poverty status. Compared with non-Hispanic whites, all Asian American children were significantly less likely to miss school because of illness or injury (Chinese: OR = 0.63, 95% CI = 0.43–0.93; Filipino: OR = 0.35, 95% CI = 0.24–0.53; Asian Indian: OR = 0.46, 95% CI = 0.29–0.72; other API: OR = 0.46, 95% CI = 0.36–0.60) and to report having learning disabilities (Chinese: OR = 0.11, 95% CI = 0.01–0.82; Asian Indian: OR = 0.06, 95% CI = 0.01–0.43; other API: OR = 0.26, 95% CI = 0.12–0.55). Other APIs were less likely to report taking prescription medication for at least 3 months (OR = 0.60, 95% CI = 0.36–0.98) compared with non-Hispanic whites. Asian Indian children were significantly less likely to report having chronic conditions (OR = 0.47, 95% CI = 0.29–0.77). No significant ethnic differences in self-assessed health status were found after controlling for socioeconomic and demographic factors.

As for the health services indicators, Chinese, Filipino, and other API children were significantly more likely than non-Hispanic whites to be without contact with a health professional within the past 12 months (Chinese: OR = 1.44, 95% CI = 1.01–2.08; Filipino: OR = 1.80, 95% CI = 1.26–2.57; other API: OR = 1.38, 95% CI = 1.07–1.78). There were no significant ethnic differences in being without health insurance, a usual source of care, and a physical examination within the past 12 months.

As for the effects of citizenship/nativity status, compared with US-born children, noncitizen immigrant children were less likely to miss school because of illness or injury (OR = 0.51, 95% CI = 0.38–0.69); have had prescription medication within the past 3 months (OR = 0.47, 95% CI = 0.23–0.95); or have had chronic conditions (OR = 0.61, 95% CI = 0.44–0.84). Noncitizen immigrant children, however, were substantially more likely to be without health insurance (OR = 3.50, 95% CI = 2.31–5.32) or a usual source of care (OR = 5.21, 95% CI = 2.78–9.80) and to be without contact with a health professional within the past 12 months (OR = 1.73, 95% CI = 1.29–2.33). The naturalized immigrant children generally did not differ significantly from US-born children on all outcomes.

Compared with children who were insured, uninsured children were less likely to have had prescription medication within the past 3 months (OR = 0.53, 95% CI = 0.42–0.66). They were substantially more likely to be without a usual source of care (OR = 8.31, 95% CI = 6.40–10.78), without a physical examination within the past 12 months (OR = 2.15, 95% CI = 1.89–2.44), and without contact with a health professional within the past 12 months (OR = 1.85, 95% CI = 1.64–2.09).

The mother's educational attainment and family's poverty status were independent risk factors for all the indicators except for missing school and chronic conditions (for poverty status). Compared with children with nonpoor and college-educated mothers, children of mothers with lower educational attainment and higher poverty rate were significantly more likely to assess self-health as fair or poor; report a higher learning disability risk; lack health insurance or a usual source of care; and report not having a physical examination or contact with a health professional in the past 12 months. The age differences in the prevalence of health indicators are as expected. Of particular interest are the significantly increased risks among children 5 to 11 and 12 to 17 years old for a lack of usual source of care and no physical examination or contact with a health professional in the last 12 months. Two gender patterns are also worth noting: the significantly higher risks of learning disability and use of prescription medication among the male children as compared with female children.

## DISCUSSION

By using recent NHIS data, this study shows important differences in health status, health care access, and utilization among Chinese, Filipino, Asian Indian, other API children, and non-Hispanic white children. Consistent with previous studies on ethnic patterns in child and adult health, Asian American children do better than non-Hispanic whites with respect to several health status measures such as school absence, learning disability, use of prescription medication, and chronic conditions. This study also finds significantly better health among the noncitizen immigrant children compared with the US-born, a finding consistent with results of previous studies on adults.<sup>14–19</sup> Important socioeconomic in-

**TABLE 3.** Results of Logistic Regression Analyses of Selected Health Status and Health Services Indicators

	Health status indicators				Health services utilization indicators				
	Fair/Poor Health Status	Missed School Because of Sickness (5-17)	Learning Disabilities (3-17)	Had Medication in Last 3 Months	Chronic Conditions	No Health Insurance	No Usual Source of Care	No Physical Exam Within 12 Months	No Contact With Physician Within 12 Months
	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)	
Race/ethnicity									
Non-Hispanic white	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Chinese	0.39 (0.10-1.49)	0.63 (0.43-0.93)	0.11 (0.01-0.82)	0.60 (0.30-1.20)	1.02 (0.70-1.47)	1.10 (0.64-1.89)	1.52 (0.58-3.97)	1.41 (0.99-2.01)	1.44 (1.01-2.08)
Filipino	0.27 (0.04-1.89)	0.35 (0.24-0.53)	0.58 (0.20-1.67)	0.52 (0.25-1.08)	0.85 (0.57-1.26)	0.78 (0.39-1.55)	2.55 (0.77-8.41)	1.26 (0.89-1.78)	1.80 (1.26-2.57)
Asian Indian	0.21 (0.03-1.59)	0.46 (0.29-0.72)	0.06 (0.01-0.43)	0.49 (0.22-1.08)	0.47 (0.29-0.77)	1.16 (0.67-1.99)	0.72 (0.24-2.17)	1.09 (0.72-1.66)	1.49 (0.95-2.33)
Other API	0.85 (0.35-2.05)	0.46 (0.36-0.60)	0.26 (0.12-0.55)	0.60 (0.36-0.98)	0.94 (0.71-1.25)	1.15 (0.78-1.70)	1.68 (0.97-2.92)	1.08 (0.82-1.42)	1.38 (1.07-1.78)
Age, y									
0-4	1.00	na	na	1.00	1.00	1.00	1.00	1.00	1.00
5-11	1.11 (0.80-1.54)	1.00	1.00	2.16 (1.89-2.48)	1.33 (1.22-1.46)	1.11 (0.96-1.27)	1.52 (1.06-2.18)	4.17 (3.80-4.57)	1.83 (1.65-2.02)
12-17	1.38 (0.97-1.95)	0.19 (0.17-0.22)	6.39 (4.90-8.34)	3.21 (2.82-3.66)	1.67 (1.53-1.82)	1.15 (1.01-1.31)	2.61 (1.87-3.65)	3.75 (3.39-4.15)	2.12 (1.92-2.33)
Gender									
Female	1.12 (0.85-1.47)	0.92 (0.84-1.00)	2.01 (1.77-2.29)	1.38 (1.25-1.51)	1.14 (1.06-1.22)	1.01 (0.90-1.14)	0.87 (0.68-1.12)	0.96 (0.9-1.03)	1.05 (0.96-1.14)
Male	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Citizenship/nativity status									
US-born citizen	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Naturalized citizen	0.85 (0.18-4.05)	0.73 (0.50-1.08)	1.18 (0.63-2.21)	0.54 (0.29-1.00)	0.85 (0.57-1.26)	0.90 (0.50-1.62)	1.43 (0.56-3.63)	0.83 (0.55-1.25)	0.82 (0.55-1.24)
Non-US citizen	1.44 (0.50-4.12)	0.51 (0.38-0.69)	0.36 (0.09-1.35)	0.47 (0.23-0.95)	0.61 (0.44-0.84)	3.50 (2.31-5.32)	5.21 (2.78-9.80)	1.01 (0.73-1.40)	1.73 (1.29-2.33)
Mother's education									
Less than high school	2.59 (1.48-4.52)	0.93 (0.79-1.1)	1.93 (1.55-2.42)	0.88 (0.72-1.08)	0.71 (0.61-0.82)	4.75 (3.69-6.13)	1.59 (1.02-2.48)	1.48 (1.28-1.71)	1.75 (1.51-2.03)
High school graduate	2.19 (1.36-3.52)	1.02 (0.92-1.14)	1.26 (1.04-1.53)	0.82 (0.71-0.94)	0.82 (0.75-0.89)	2.98 (2.43-3.67)	1.50 (1.02-2.21)	1.45 (1.32-1.61)	1.38 (1.22-1.55)
Some college	1.55 (0.94-2.55)	1.1 (0.98-1.22)	1.42 (1.19-1.70)	1.08 (0.96-1.22)	1.05 (0.96-1.14)	2.41 (1.95-2.99)	1.31 (0.93-1.86)	1.19 (1.08-1.3)	1.20 (1.08-1.33)
College graduate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poverty status									
Poor	3.62 (2.39-5.48)	0.91 (0.77-1.07)	2.33 (1.88-2.90)	1.38 (1.16-1.65)	1.05 (0.93-1.19)	3.49 (2.91-4.18)	2.91 (2.01-4.21)	1.07 (0.93-1.22)	1.14 (1.00-1.30)
Near poor	1.99 (1.39-2.85)	0.96 (0.84-1.10)	1.69 (1.42-2.00)	1.02 (0.88-1.18)	1.00 (0.91-1.10)	4.05 (3.52-4.65)	2.05 (1.50-2.80)	1.19 (1.08-1.31)	1.11 (0.99-1.25)
Not poor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Health insurance									
Yes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	0.75 (0.50-1.15)	1.09 (0.91-1.30)	0.83 (0.67-1.03)	0.53 (0.42-0.66)	0.88 (0.78-1.00)	na	8.31 (6.40-10.78)	2.15 (1.89-2.44)	1.85 (1.64-2.09)

NA indicates not applicable.

equalities in child health could also be noted by both maternal education and poverty status.

Citizenship/nativity status and socioeconomic factors do contribute to the observed ethnic differences in health status and health care access and utilization shown here (data not shown for the sake of brevity). Compared with the US-born, immigrants generally have more favorable behavioral, familial, and social support characteristics, which in turn may explain better health of immigrants. In this study, the Asian American subgroups had a higher proportion of the immigrant population, and mothers of Chinese, Asian Indian, and Filipino children had substantially higher educational achievements than non-Hispanic whites.

Consistent with the acculturation hypothesis,<sup>31</sup> although noncitizen immigrant children had better health than their US-born counterparts, immigrant children who were naturalized US citizens did not differ significantly from US-born children. Naturalized immigrant children and their parents presumably have been in the United States longer than non-citizen immigrant children and their parents, which may imply higher levels of acculturation and assimilation and subsequently less favorable health among the naturalized immigrant children.

Although Asian ethnicity and immigrant status are associated with better health among children, these characteristics have been shown here to be negatively associated with health care access and utilization, similar to other reports from both the United States and England.<sup>24,39,40</sup> Asian American children are also less likely to avail the existing health care system, as evident from their lower odds of contacting a physician or having a physical examination, after controlling for other factors. This suggests cultural and linguistic barriers in the health care system that discourage access despite eligibility. Immigrant children who are not naturalized citizens clearly face substantial barriers to seeking and receiving health care in the United States, a finding that confirms reports in general immigrant populations.<sup>20,41</sup> It is also unknown whether the "better health" observed among Asian American children could in fact be associated with less diagnosis and treatment resulting from lower access and utilization. The low level of school absence because of illness among Asian children could be influenced by the emphasis on education among Asian cultures and may be a less valid measure of health.

Some limitations of this analysis should be noted. The NHIS is conducted in English or Spanish but not in any Asian languages. The Asian respondents therefore may tend to be more educated and fluent in English, thus resulting in a possible underestimate of risk for the actual Asian populations in the United States. The heterogeneity of the "other API" group also adds complexities to the interpretation and inferences of data pertaining to the many ethnicities this group encompasses. Because the data are based on self-report, cultural differences may influence the way parents perceive their children's health status and health care needs. In addition, information on use of complementary and alternative medicine,

which may be popular among Asian groups, is not available. Although many of the estimates of the Asian groups are insignificant because of the small numbers, the direction of the risks in these populations is evident.

Our data clearly illustrate the heterogeneity among Asian American ethnicities in the composition of their citizenship/nativity status, socioeconomic status, and parental characteristics. These findings are similar to the studies that focused on Asian ethnic differences in prenatal care utilization<sup>30</sup> and adult health outcomes.<sup>31</sup> Asian Indian children have the largest percentage of noncitizens, suggesting that they are more-recent immigrants. More than 25% of the other API children live in households below the federal poverty level, whereas nearly 30% of their mothers have not graduated from high school. However, these children are mostly US-born or naturalized citizens, indicating a relatively small proportion of recent immigrants. Although little differences persist after controlling for population characteristics, these differences have important implications in the delivery of public health programs and clinical services for Asian American children. Our findings emphasize the need for outreach efforts to Asian immigrant populations to educate them on accessing and navigating the health care system, particularly in obtaining a usual source of care and preventive services. Linguistically and culturally appropriate services are especially needed for children and families who are less knowledgeable about and accustomed to the US health care system.

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