Disaggregating Asian American and Native Hawaiian and Other Pacific Islander (AANHOPI) Adult Tobacco Use: Findings from Wave 1 of the Population Assessment of Tobacco and Health (PATH) Study, 2013–2014

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Abstract

Introduction—Tobacco studies often combine data for Asian American and Native Hawaiian and Other Pacific Islander (AANHOPI) subgroups, masking subgroup differences. This study describes tobacco use (ever use and past 30-day use) among some disaggregated AANHOPI subgroups.

Methods—Data are from Wave 1 of the 2013–2014 Population Assessment of Tobacco and Health (PATH) Study, a nationally representative, longitudinal cohort study of civilian non-institutionalized adults and youth in the USA. The dataset contains a sample of 32,320 adults, of which 1623 identified as being of AANHOPI origin. Asian Americans further identified as being Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or other Asian. Those who identified as Native Hawaiian, Guamanian or Chamarro, Samoan, and Other Pacific Islander were combined into an NHOPI group. Tobacco measures included ever and past 30-day use of cigarettes, e-cigarettes, cigars (traditional cigar, cigarillos, filtered cigar), hookah, and smokeless tobacco including snus pouches, and pipe tobacco. Unadjusted and adjusted estimates for tobacco use are reported by AANHOPI membership and sex.

Results—In general, Asian Indians and Chinese had the lowest and NHOPI had the highest tobacco use prevalence compared to other AANHOPI subgroups. Males generally had higher prevalence compared to females. Prevalence varied by AANHOPI membership and tobacco product. Adjusted prevalence estimates were higher compared to unadjusted estimates for many subgroups, attenuating some unadjusted differences found between AANHOPI subgroups.

Discussion—Tobacco use varies by AANHOPI subgroup and product type. Unadjusted and adjusted analyses can be conducted as tobacco use differences in AANHOPI subgroups may be attributed to socio-economic status differences. Treating these distinct subgroups as a monolithic group may contribute to reliance on tobacco prevention and control strategies that may have limited impact on specific subgroups.

Keywords

Tobacco; Tobacco-related disparities; Asian American; Native Hawaiian and other Pacific islander; Disaggregated data; Population health

Introduction

Asian American and Native Hawaiian and other Pacific Islander (AANHOPI) subgroups are often combined and studied as an aggregate due to the assumption that these groups are similar or because of methodological issues such as small samples [1–4]. Use of aggregated data obscures important distinctions in historical narratives, cultural values, and socioeconomic status while also masking downstream consequences in health and well-being that are unique to subgroups [2, 5, 6]. For example, in studies that disaggregate these subgroups, differences in health outcomes such as cancer incidence [7–9] and health behaviors such as cancer screening [10] are often found between subgroups. The Department of Health and Human Services (DHHS) provides guidelines for data collection standards for federal data, recommending further granularity to the Office and Management and Budget's (OMB) standard racial/ethnic categories so that the Asian American (AA) category is refined into seven subgroups (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, and other Asians) and the Native Hawaiian and other Pacific Islander (NHOPI) category into four subgroups (Native Hawaiian, Guamanian or Chamorro, Samoan, and Other Pacific Islanders) [11, 12].

Studies examining tobacco use often combine AANHOPI subgroups into one homogenous group. In general, AANHOPIs display the lowest prevalence of tobacco use compared to other racial/ethnic groups [13–15]. Data from the 2013–2014 National Adult Tobacco Survey (NATS) show that prevalence of every day/some use of any tobacco product was lowest among Asians (11.2%) compared to other racial/ethnic groups: Hispanic (17.6%), White (21.3%), Black (25.1%), and Other (32.6%) [13]. However, aggregated data mask subgroup differences in tobacco use. An earlier study by Mukherjea and colleagues disaggregated AANHOPI data from the 2009–2010 NATS and found that ever and current tobacco use varied by subgroup and by product type [16]. Notably, current hookah use was highest among Koreans, ever smokeless tobacco use was highest among Japanese, and ever cigar use was highest among NHOPI. However, the study did not adjust for sociodemographic traits, a major study limitation as AANHOPI subgroups reflect both the highest and lowest levels of SES indicators (e.g., education, income, insurance status, and language proficiency) among various racial/ethnic groups [6, 17].

The aim of the current study is to describe ever and past 30day tobacco use among some disaggregated AANHOPI subgroups. Findings will provide unique contributions to our

understanding of tobacco-related health disparities by updating disaggregated findings by (a) conducting both unadjusted and adjusted analyses (controlling for sociodemographic variables) and (b) describing cigarette and other tobacco product use, as disaggregated AANHOPI estimates of e-cigarette and pipe tobacco use are unknown.

Methods

Sample

Data are from Wave 1 of the PATH study which is a nationally representative, longitudinal cohort study of 45,971 civilian non-institutionalized adults and youth in the USA, fielded from September 2013 to December 2014. The PATH study employs a stratified address-based, area-probability sampling and uses audio computer-assisted self-interviews to collect self-report information on tobacco use patterns and related health behaviors. The current analyses draw from the adult interviews (ages 18 years and older). Among households screened for Wave 1 (weighted household screener rate = 54.0%), the overall adult interview weighted response rate was 74.0%. Further details regarding the PATH study design and methods are published elsewhere [18].

The PATH study dataset contains a sample of 32,320 adults, of which 1623 identified as being of AA or NHOPI origin. AA individuals were further identified as being Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or other Asian. Only single-ethnic respondents were included to maximize distinctions among AA subgroups. Due to small samples, those who identified as Native Hawaiian ($n = 47$), Guamanian or Chamarro ($n = 29$), Samoan ($n = 17$), and Other Pacific Islander ($n = 330$) were combined into a NHOPI group. Individuals who did not identify with AA or NHOPI origin were classified as non-AANHOPI following a similar strategy by Mukherjea and colleagues (2014) [16].

Measures

Tobacco measures included ever and past 30-day use of cigarette, e-cigarettes, cigars (traditional cigar, cigarillo, filtered cigar), hookah, smokeless tobacco (pouched snus, loose snus, moist snuff, dip, spit, and chewing tobacco), and pipe tobacco. Respondents were categorized as ever users if they reported they had ever tried the product, even one or two times. Respondents were categorized as past 30-day users if they reported using the product at least once in the past 30 days.

Sociodemographic measures included sex (male or female), age (18–24, 25–44, 45–64, 65+), education (less than high school (HS) diploma/general equivalency diploma (GED), HS grad, some college or associate degree, bachelors, advance degree), urban/rural, health insurance status (yes, no), annual household income (< 10,000–24,999, 25,000–49,000, 50,000–74,999, 75,000–99,999, 100,000+), and sexual orientation (lesbian/gay/bisexual/something else or straight).

Analysis

All analyses were conducted in 2018 using SAS version 9.3 (SAS Institute, Cary, NC) and SAS-callable SUDAAN version 11.0.1 (Research Triangle Institute, Research Triangle Park,

NC). Analyses were conducted using replicate weights and balanced repeated replication methods (BRR) to account for the PATH Study's complex survey design [18]. Prevalence estimates for tobacco use are reported by AANHOPI membership and are further stratified by sex. Prevalence estimates with a relative standard error of > 30% were flagged as potentially unreliable. Chi-square analyses tested the unadjusted association between AANHOPI membership and tobacco use (ever use and past 30-day use). Logistic regression analyses tested the adjusted associations, controlling for sociodemographic variables, and produced predicted marginals. Missing data were handled with listwise deletion.

Results

Sociodemographics Characteristics of AANHOPI Adults

Table 1 shows sociodemographic characteristics for the AANHOPI subgroups. Among AANHOPI subgroups, Asian Indian and Chinese respondents displayed the highest proportions while NHOPI respondents displayed the lowest proportions of having a bachelor's degree and beyond. Compared to other subgroups, NHOPI respondents had the highest proportion of having less than a high school diploma/GED. Asian Indian and Chinese respondents displayed the highest proportions while NHOPI respondents displayed the lowest proportions of having an annual household income of $75,000 and higher. Compared to other subgroups, NHOPI respondents had the highest proportion reporting an annual household income of < 10,000 to 24,999.

Ever Tobacco Use

The adjusted prevalence of ever use significantly differed by AANHOPI subgroup. Ever cigarette use ($F = 15.11$, $p = <.001$) ranged from as low as 36.93% among Chinese respondents to as high as 68.76% among Japanese respondents. Ever e-cigarette use ($F = 3.74$, $p = <.001$) ranged from as low as 10.63% among Asian Indian respondents to as high as 20.74% among Japanese respondents. Ever cigar use ($F = 20.98$, $p = <.001$) ranged from as low as 13.17% among Chinese respondents to as high as 39.78% among Korean respondents. Ever hookah use ($F = 4.54$, $p = <.001$) ranged from as low as 9.13% among Chinese respondents to 25.87% Korean respondents. Ever smokeless use ($F = 10.28$, $p = <.001$) ranged from as low as 3.96% among Asian Indian respondents to as high as 17.40% among Japanese respondents. Ever pipe use ($F = 14.91$, $p = <.001$) ranged from as low as 3.59% among Asian Indian respondents to as high as 19.64% among Japanese respondents.

Past 30-Day Tobacco Use

The adjusted prevalence of past 30-day use significantly differed by AANHOPI subgroup. Past 30-day cigarette use ($F = 5.20$, $p = <.001$) ranged from as low as 13.25% among Chinese respondents to as high as 19.37% among Japanese respondents. Past 30-day cigar use ($F = 5.92$, $p = <.001$) ranged from as low as 2.54% among Chinese respondents to as high as 8.18% among Japanese respondents. Past 30-day hookah use ($F = 4.77$ $p = <.001$) ranged from as low as 1.23% among Vietnamese respondents to 4.69% among NHOPI respondents. There were no significant subgroup differences in past 30-day e-cigarette and pipe use. Refer to Tables 2 and 3 for findings of adjusted analyses.

In general, adjusted ever use and past 30-day use was lower for AANHOPI subgroups compared to the non-AANHOPI group for all tobacco products except for hookah use. Ever hookah use was significantly higher ($p < .05$) for Korean respondents (25.87%) compared to the non-AANHOPI respondents (17.25%). Past 30-day hookah use was significantly higher ($p < .05$) for other Asian (3.94%) and NHOPI (4.69%) compared to the non-AANHOPI respondents (2.16%).

Adjusted analyses varied by sex. In general, males had higher prevalence of ever and past 30-day use compared to females. There were also subgroup differences found within sex. Japanese males had highest prevalence of ever hookah use and ever pipe tobacco use while Korean males had highest prevalence of ever and past 30-day smokeless use compared to other AANHOPI subgroups. Among females, Asian Indian and Chinese had the lowest prevalence of ever and past 30-day use compared to other AANHOPI females in general. In general, AANHOPI females had lower prevalence of ever and past 30-day use compared to non-AANHOPI females except for past 30-day hookah use where Chinese females had higher prevalence compared to non-AANHOPI females.

There are findings which differed between the adjusted and unadjusted analyses. Adjusted prevalence estimates for AANHOPI tobacco use were higher compared to unadjusted estimates. In addition, unadjusted analyses generally showed that NHOPI had the highest prevalence of ever and past 30-day use compared to AANHOPI subgroups while these differences were attenuated in the adjusted analyses. Many AANHOPI subgroup differences found in unadjusted analyses (e.g., the findings that Japanese, NHOPIs, Filipinos, and Koreans had highest prevalence of cigarette ever use while NHOPI, Filipino, and other Asian had highest prevalence of e-cigarette ever use compared to other AANHOPI subgroups) were attenuated in the adjusted analyses. Refer to Supplementary Table A for unadjusted findings.

Discussion

This study described tobacco use behaviors of diverse tobacco products among disaggregated AANHOPI subgroups. The study's findings generally show that AANHOPIs had lower ever and past 30-day tobacco use compared to the non-AANHOPIs in both unadjusted and adjusted analyses. These findings align with research that shows that AANHOPIs tend to have lower prevalence of tobacco use compared to other racial/ethnic groups [13–15]. However, reliance on aggregate measures of race and ethnicity may contribute to faulty assumptions underlying the "model minority myth," the stereotype that Asian Americans are uniformly successful, hardworking, educated, and do not experience health disparities [19]. These stereotypes may lead to lower prioritization of data collection and surveillance on specific AANHOPI subgroups with implications in decreased resource allocation and health and policy initiatives [20–23],and in particular, areas of tobacco use [4, 24]. In addition, unadjusted analyses indicate that some AANHOPI groups had higher hookah use compared to non-AANHOPIs, underscoring how generalizations may obscure tobacco-related disparities among these subgroups.

Differences in tobacco use were observed among AANHOPI groups. For unadjusted analyses, Asian Indian and Chinese respondents generally displayed the lowest prevalence while NHOPI respondents generally displayed the highest prevalence of ever and past 30-day tobacco use. These findings highlight differences in tobacco use that may provide context for disparities found in tobacco-related cancer incidence rates among AANHOPI groups. For example, study findings using SEER registry data showed that while cancer rates varied by subgroup, the lowest rates were observed in Asian Indian adults while the highest rates are observed in Native Hawaiian adults [8, 9].

The study's findings showed that tobacco use varied by sex (in general, AANHOPI males had higher prevalence of ever and past 30-day tobacco use compared to AANHOPI females). In addition, the study's findings showed that tobacco product use varied by tobacco product (e.g., adjusted findings showed that Korean, Japanese, and NHOPI had highest prevalence of ever cigar use while other Asian and NHOPI had highest past 30-day hookah use compared to other AANHOPI subgroups). These findings are aligned with findings by Mukherjea and colleagues [16]. However, this study extends the literature by providing both unadjusted and adjusted estimates of ever and past 30-day tobacco use among AANHOPI. Findings indicate that adjusted estimates for AANHOPI tobacco use were higher compared to unadjusted estimates, attenuating some differences found between AANHOPI subgroups in unadjusted analyses. This suggests the tobacco use disparities among AANHOPI subgroups may be partially explained by differences in socio-economic status. For example, the findings showed that Asian Indians and Chinese respondents had higher levels of educational attainment and annual household income (and in general, the lowest unadjusted estimates of tobacco use) compared to NHOPI respondents who had lower levels of educational attainment and annual household income (and in general, the highest unadjusted estimates of tobacco use). The study's findings confirming previous support for the role of socio-demographic correlates on tobacco use [25, 26].

However, subgroup differences remained in the adjusted analyses (e.g., Japanese and Korean men had the highest prevalence of ever cigar use while other Asian and NHOPI had highest past 30-day hookah use compared to men in other AANHOPI subgroups) suggesting the potential role of unaccounted cultural factors that may include acculturation and immigration histories of specific subgroups [27]. The intersection of these factors are thought to play a complex role in influencing tobacco-related outcomes such that recent immigrants may experience the so-called "healthy immigrant effect" in which these individuals display healthier outcomes and behaviors (e.g., displaying lower smoking prevalence) than their USA-born counterparts [28–30]. Though lower acculturation may initially serve as a protective factor against tobacco-related outcomes, higher acculturation may lead to the adoption of mainstream tobacco normative behaviors and attitudes that result in increased tobacco use [31]. The study's findings highlight the importance of monitoring diverse tobacco product use among specific at-risk populations and understanding these important factors to inform effective tobacco prevention and intervention efforts.

The study's limitations included small samples of some AANHOPI subgroups which may produce potentially unreliable estimates that should be interpreted with caution. Due to small samples, other measures of tobacco use (i.e., everyday or some day use) were omitted

due to values with high relative standard errors. Smaller samples of those identifying as Native Hawaiian, Guamanian or Chamarro, Samoan, or other Pacific Islander were combined into a larger NHOPI group, potentially masking differences in tobacco use estimates in these groups. In addition, the survey was conducted in English and lacked items assessing items such as immigration status and language in the household, preventing assessment of acculturative factors. Despite this, the paucity of disaggregated AANHOPI data in tobacco use makes the study findings important to disseminate in helping to understand tobacco-related health disparities.

In conclusion, research that uses aggregated Asian American and Native Hawaiian and Other Pacific Islander (AANHOPI) data overlooks distinctions in tobacco use patterns among subgroups. The study's use of disaggregated data indicated that tobacco use varies by subgroup and by tobacco product type. Both unadjusted and adjusted analyses should be conducted as some differences in tobacco use in AANHOPI subgroups may be attributed to socio-economic status. Treating these distinct subgroups as a monolithic group may contribute to reliance on tobacco prevention and control strategies that may have limited impact on specific subgroups [4].

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Demographic characteristics of AANHOPI adults PATH study Wave 1, 2013–14 (*N* = 1623)

	Asian Indian (n = 247)		Chinese (n = 224)		Filipino (n = 226)		Japanese (n = 94)		Korean (n = 105)		Vietnamese (n = 66)		Other Asian (n = 205)		NHOPI (n = 456)	
	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI
Sex																
Male	52.04	41.93; 61.98	42.72	33.64; 52.32	47.9	37.79; 58.18	47.62	30.70; 65.11	44.26	30.66; 58.79	50.49	33.11; 67.76	58.24	48.24; 67.60	49.96	43.15; 56.78
Female	47.96	38.02; 58.07	57.28	47.68; 33.36	52.1	41.82; 62.21	52.38	34.89; 69.30	55.74	41.21; 69.34	49.51	32.24; 66.89	41.76	32.40; 51.76	50.04	43.22; 56.85
Age group (years)[b]																
18–24	14.84	10.51; 20.53	23.93	17.58; 31.70	13.39	9.53; 18.51	10.46	5.85; 18.01	20.15	11.89; 32.06	31.84	19.25; 47.77	24.67	17.89; 32.98	26.41	22.25; 31.30
25–44	54.46	46.15; 62.52	42.46	34.46; 50.88	36.4	27.98; 45.75	18.93	12.45; 27.71	35.87	21.75; 52.95	36.83	21.72; 55.06	46	36.25; 56.06	47.74	40.18; 55.40
45–64	25.89	18.71; 34.66	26.12	19.11; 34.61	36.06	26.70; 46.62	49.88	37.46; 62.31	35.93	19.67; 56.23	-	-	26.18	17.25; 37.63	22.18	16.27; 29.49
65+	4.81[c]	2.20; 10.20	7.48	4.01; 13.55	14.15[c]	7.08; 26.29	20.74	11.08; 35.45	8.05[c]	2.07; 26.63	-	-	3.15[c]	.90; 10.43	3.68[c]	1.17; 10.99
Education																
Less than high school diploma/GED	9.61	6.43; 14.12	3.95[c]	1.50; 10.03	10.54	6.44; 16.79	6.18[c]	2.90; 12.68	7.49[c]	2.90; 18.80	7.06[c]	2.60; 17.74	11.19	7.03; 17.33	30.91	24.45; 38.22
High school diploma	7.45	4.17; 12.97	9.55[c]	4.92; 17.75	13.62	8.05; 22.12	21.36[c]	8.44; 44.48	17.6[c]	7.24; 36.87	19.71	11.56; 31.55	16.47	9.60; 26.79	28.55	23.01; 34.83
Some college/Associate degree	15.35	8.45; 26.27	18.47	13.01; 25.56	32.77	25.07; 41.52	23.62	15.02; 35.12	26.26	13.87; 44.05	35.78	22.67; 51.43	30.83	21.71; 41.74	32.06	25.09; 39.92
Bachelors	31.36	24.69; 38.90	30.25	22.33; 39.53	36.47	26.34; 47.96	33.22	21.17; 47.95	32.4	20.29; 47.45	21.06[c]	10.00; 39.06	25.96	17.10; 37.35	7.24	4.56; 11.32
Advance degree	36.22	28.11; 45.20	37.77	30.11; 46.09	6.59[c]	3.27; 12.82	15.61	8.91; 25.93	16.25[c]	7.06; 33.12	16.39[c]	6.73; 34.75	15.55	9.43; 24.56	1.24[c]	0.51; 2.98
Urban/rural																
Urban	-	-	97.58	92.34; 99.26	95.91	91.20; 98.15	91.27	80.71; 96.32	96.42	90.43; 98.71	97.4	90.81; 99.30	93.44	80.91; 97.95	96.08	94.17; 97.38
Rural	-	-	2.42[c]	.74; 7.66	4.09[c]	1.85; 8.80	8.73[c]	3.68; 19.29	3.58[c]	1.29; 9.57	2.6	0.70; 9.19	6.56[c]	2.05; 19.09	3.92	2.62; 5.83
Health insurance																
Yes	91.1	85.66; 94.61	89.17	81.12; 94.04	90.74	85.73; 94.11	89.27	67.55; 97.08	91.94	79.48; 97.11	91.16	76.27; 97.07	85.72	77.65; 91.21	73.08	66.42; 78.85
No	8.9	5.39; 14.34	10.83	5.96; 18.88	9.26	5.89; 14.27	10.73[c]	2.92; 32.45	8.06[c]	2.89; 20.52	8.84	2.93; 23.73	14.28	8.79; 22.35	26.92	21.15; 33.58
Income																
< 10,000–24,999	23.62	18.65; 29.44	31.21	23.66; 39.90	27.09	18.42; 37.95	9.52	10.62; 47.53	28.28	16.87; 43.37	34.89	21.08; 51.80	35.21	25.36; 46.50	53.32	45.93; 60.57
25,000–49,999	14.91	9.36; 22.90	14.97	9.47; 22.85	21	14.28; 29.77	23.39[c]	14.62; 47.86	14.24[c]	7.64; 24.99	25.01	13.38; 41.85	30.8	21.15; 42.48	25.5	19.74; 32.27
50,000–74,999	11.47	7.05; 18.13	9.71	5.63; 16.22	14.19	9.46; 20.73	10.35	7.00; 15.06	15.18[c]	6.17; 32.74	12.43[c]	4.89; 28.15	13.77[c]	7.38; 23.24	8.22	5.71; 11.71
75,000–99,999	15.06	9.73; 22.58	6.74	4.05; 11.01	13.87	8.65; 21.50	8.98[c]	3.30; 22.20	9.37[c]	2.98; 25.85	2.09[c]	0.36; 11.15	7.65[c]	3.79; 14.84	3.76[c]	1.93; 7.21
100,000+	34.94	27.51; 43.17	37.38	29.55; 45.94	23.85	16.54; 33.11	27.57	17.31; 40.90	32.93	20.69; 48.03	25.58[c]	12.02; 46.38	12.57	7.42; 20.50	9.19	5.81; 14.25
Sexual orientation																

	Asian Indian (n = 247)		Chinese (n = 224)		Filipino (n = 226)		Japanese (n = 94)		Korean (n = 105)		Vietnamese (n = 66)		Other Asian (n = 205)		NHOPI (n = 456)	
	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI
Lesbian, gay, bisexual, something else	5.82[c]	2.57; 12.65	8.86[c]	4.50; 16.71	4.17[c]	1.61; 10.42	2.9[c]	1.26; 6.55	1.46	0.62; 3.41	1.97[c]	0.40; 9.22	5.4	2.42; 11.63	7.68	4.86; 11.95
Straight	94.18	87.35; 97.43	91.14	83.29; 95.50	95.83	89.58; 98.39	97.1	93.45; 98.74	98.54	96.59; 99.38	98.03	90.78; 99.60	94.6	88.37; 97.58	92.32	88.05; 95.14

GED general education development certificate, *AANHOPI* Asian American and Native Hawaiian and Other Pacific Islander, *NHOPI* Native Hawaiian and Other Pacific Islander, — instances where the numerator was 0 or where value was suppressed due to counts < 3

[a] Proportions (%s) are weighted to reflect the non-institutionalized, civilian US population

[b] When respondent age was missing, imputed values for age were used as described in the PATH Restricted Use File User Guide (United States Department of Health and Human Services, 2017)

[c] Estimate has a relative standard error that is larger than 30%. Interpret with caution

Table 2

Adjusted estimates of ever and past 30-day cigarette, e-cigarette, and cigar product use by AANHOPI membership[a] ($N = 31{,}425$)

	Cigarette				E-cigarette				Cigar[b]			
	Ever use		Past 30-day		Ever use		Past 30-day		Ever use		Past 30-day	
	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI
	Wald F = 15.11 p <.001		Wald F = 5.20 p <.001		Wald F = 3.74 p <.001		Wald F = 1.65 p = .12		Wald F = 20.98 p <.001		Wald F = 5.92 p <.001	
AANHOPI	52.37	48.13; 56.57	16.97	15.11; 19.02	14.47	12.72; 16.41	5.21	4.33; 6.26	22.75	20.04; 25.71	3.84	3.13; 4.71
Asian Indian	42.84	33.91; 52.26	13.25	8.96; 19.17	10.63	7.13; 15.56	2.95[c]	1.41; 6.05	14.75	10.06; 21.12	2.71	1.59; 4.60
Male	61.58	49.69; 72.23	21.17	14.29; 30.20	15.28	10.42; 21.85	3.38[c]	1.53; 7.28	27.53	18.38; 39.05	3.85[c]	2.03; 7.19
Female	22.96	14.43; 34.51	4.40[c]	1.65; 11.22	3.64[c]	1.45; 8.88	2.12[c]	0.62; 7.03	4.16[c]	1.91; 8.81	1.55[c]	0.45; 5.20
Chinese	36.93	29.37; 45.19	16.06	11.77; 21.53	11.23	7.52; 16.43	4.99	2.82; 8.70	13.17	8.62; 19.61	2.54[c]	1.11; 5.73
Male	56.52	44.75; 67.60	26.51	18.95; 35.75	16.57	9.98; 26.24	9.11[c]	4.66; 17.02	19.74	11.99; 30.74	5.35[c]	2.32; 11.84
Female	21.28	11.15; 36.82	6.08[c]	3.01; 11.88	5.52[c]	2.09; 13.79	0.62[c]	0.09; 4.25	8.09[c]	3.76; 16.51	-	-
Filipino	57.32	47.61; 66.50	18.06	14.13; 22.79	18.01	13.34; 23.83	6.25	3.94; 9.79	22.93	17.41; 29.58	3.32	1.93; 5.68
Male	65.04	52.32; 75.93	23.79	17.01; 32.23	19.97	12.39; 30.57	7.20[c]	3.83; 13.12	33.94	23.57; 46.12	5.36	2.90; 9.70
Female	49.77	35.21; 64.37	12.17	7.15; 19.97	16.50	11.39; 23.30	5.32	3.11; 8.96	12.32	7.90; 18.71	1.45[c]	0.29; 6.92
Japanese	68.76	49.66; 83.08	19.37	12.06; 29.63	20.74	13.43; 30.64	5.74[c]	2.55; 12.43	35.93	23.18; 51.05	8.18[c]	4.40; 14.69
Male	65.41	36.74; 86.03	21.84[c]	11.18; 38.29	23.70	13.05; 39.12	9.15[c]	3.54; 21.68	52.74	33.17; 71.50	13.59[c]	6.38; 26.60
Female	73.05	56.51; 84.98	16.84[c]	7.13; 34.81	18.33	11.66; 27.61	1.97[c]	0.21; 16.16	21.53[c]	6.71; 51.16	2.58[c]	0.38; 15.41
Korean	56.62	41.36; 70.72	18.83	12.51; 27.35	17.85	11.50; 26.66	7.83[c]	3.54; 16.43	39.78	28.81; 51.88	1.83[c]	0.54; 5.98
Male	82.04	58.10; 93.77	29.89	18.33; 44.75	24.46	14.36; 38.47	10.12[c]	3.85; 24.04	66.94	42.98; 84.48	-	-
Female	34.05[c]	17.35; 55.94	9.15[c]	4.31; 18.37	12.21[c]	5.91; 23.53	5.74[c]	1.28; 22.21	16.63[c]	6.40; 36.79	2.72[c]	0.83; 8.52
Vietnamese	58.26	40.78; 73.88	18.86	11.72; 28.92	13.52	7.68; 22.81	4.31[c]	1.48; 11.91	21.73	12.96; 34.11	4.61[c]	1.38; 14.27
Male	81.73	55.84; 94.06	27.05	15.41; 43.03	19.63[c]	10.50; 33.72	4.98[c]	1.28; 17.50	39.41	20.85; 61.64	8.73[c]	2.36; 27.49
Female	28.67[c]	11.74; 54.84	8.43[c]	2.67; 23.64	6.26	1.83; 19.29	3.49[c]	0.50; 20.63	6.07[c]	2.33; 14.90	-	-

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	Cigarette				E-cigarette				Cigar[b]			
	Ever use		Past 30-day		Ever use		Past 30-day		Ever use		Past 30-day	
	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI
	Wald F = 15.11 p < .001		Wald F = 5.20 p < .001		Wald F = 3.74 p < .001		Wald F = 1.65 p = .12		Wald F = 20.98 p < .001		Wald F = 5.92 p < .001	
Other Asian	52.35	41.94; 62.55	17.73	13.19; 23.42	16.25	11.60; 22.28	5.71	3.54; 9.08	20.11	13.56; 28.78	2.35[c]	0.99; 5.48
Male	59.52	43.15; 74.02	22.38	15.67; 30.90	17.71	11.43; 26.41	7.91	4.51; 13.52	26.19	16.77; 38.47	3.55[c]	1.12; 10.69
Female	45.98	33.61; 58.86	12.67[c]	7.14; 21.46	14.67	8.95; 23.11	2.95[c]	0.95; 8.81	15.81	8.54; 27.43	1.27[c]	0.27; 5.68
NHOPI	64.57	56.86; 71.59	17.45	14.32; 21.10	13.99	11.06; 17.55	5.38	3.96; 7.27	35.80	29.15; 43.04	6.53	5.25; 8.11
Male	76.90	68.77; 83.42	21.73	17.12; 27.17	18.37	13.85; 23.96	7.48	5.18; 10.69	48.58	39.31; 57.94	9.76	7.32; 12.89
Female	52.30	40.14; 64.18	13.32	9.66; 18.08	9.53	6.69; 13.39	2.96	1.66; 5.25	23.84	15.76; 34.44	3.55	2.24; 5.59
Non-AANHOPI	69.57[d]	68.30; 70.82	23.79	23.07; 24.52	18.73	18.11; 19.38	7.11	6.78; 7.45	44.04	42.90; 45.19	7.89	7.55; 8.24
Male	73.69	72.11; 75.20	26.69	25.77; 27.63	20.53	19.68; 21.39	7.67	7.23; 8.16	61.26	59.69; 62.80	11.69	11.08; 12.32
Female	65.62	64.16; 67.04	21.02	20.16; 21.91	17.03	16.33; 17.77	6.56	6.16; 6.99	27.41	26.32; 28.52	4.24	3.97; 4.53

Respondents were categorized as ever users if they reported they had ever tried the product, even one or two times. Respondents were categorized as past 30-day users if they reported using the product at least once in the past 30 days. Italicized F-values denote p .05

AANHOPI Asian American and Native Hawaiian and Other Pacific Islander, *NHOPI* Native Hawaiian and Other Pacific Islander, *non-AANHOPI* respondents who are not classified as either Asian American or Native Hawaiian or Other Pacific Islander, —instances where the numerator was 0 or where value was suppressed due to counts < 3

[a] Proportions are weighted to reflect the non-institutionalized, civilian US population and are adjusted by age, education, urban/rural, health insurance status, annual household income, and sexual orientation. Logistic regression analyses tested the association between AANHOPI membership and tobacco ever and past-30 day use

[b] "Cigar" reflects traditional cigar, cigarillo, and filtered cigar use; respondents who indicated they used any cigar product were included in analyses even if they had missing date for other cigar products

[c] Estimate has a relative standard error that is larger than 30%. Interpret with caution

[d] Other national data systems that fielded data during a similar timeframe to the 2013–2014 PATH wave 1 study were consulted such as 2013 NHIS, NHANES 2013–2014, BRFFS 2013, and 2010–2011 TUS CPS. Estimates from these data systems are lower than PATH estimates as ever smoking in these data systems was assessed with the 100-cigarette threshold such that ever use captured respondents who had smoked at least 100 cigarettes in their lifetime. However, NATS 2013–2014 which assesses ever smoking captured in PATH wave 1 also asks if respondents has "ever tried cigarette smoking, even one or two puffs?" and has similar ever use prevalence

Table 3

Adjusted estimates of ever and past 30-day hookah, smokeless tobacco, and pipe tobacco product use by AANHOPI membership [a] (N = 31,425)

	Hookah				Smokeless tobacco [b]				Pipe tobacco			
	Ever use		Past 30-day		Ever use		Past 30-day		Ever use		Past 30-day	
	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI	% [a]	95% CI
	Wald F = 4.54 p <.001		Wald F = 4.77 p <.001		Wald F = 10.28 p <.001		Wald F = 4.78 p <.001		Wald F = 14.91 p <.001		Wald F = .86 p =.55	
AANHOPI	16.20	14.29; 18.31	3.05	2.41; 3.85	7.63	6.17; 9.41	-	-	8.33	7.11; 9.74	-	-
Asian Indian	14.96	11.22; 19.67	3.49	2.16; 5.59	3.96 c	1.81; 8.44	-	-	3.59 c	1.96; 6.50	-	-
Male	17.33	11.98; 24.42	4.26	2.37; 7.55	7.81 c	3.36; 17.11	-	-	7.48 c	4.02; 13.51	-	-
Female	12.76	8.50; 18.71	2.74 c	1.44; 5.15	0.52 c	0.07; 3.98	-	-	0.15 c	0.01; 2.14	-	-
Chinese	9.13	6.76; 12.16	1.49 c	0.70; 3.12	4.25 c	2.12; 8.34	-	-	5.42 c	2.60; 10.97	-	-
Male	11.96	7.57; 18.38	1.89 c	0.67; 5.18	9.49 c	4.72; 18.17	-	-	8.69	4.79; 15.25	1.52 c	0.43; 5.27
Female	6.83	4.19; 10.95	4.21 c	3.18; 4.52	0.00	-	-	-	2.38 c	0.20; 22.88	-	-
Filipino	16.29	11.52; 22.53	2.67 c	1.38; 5.11	8.22	4.66; 14.10	-	-	4.88 c	2.59; 9.03	-	-
Male	19.56	11.90; 30.46	3.18 c	1.46; 6.78	11.46 c	6.35; 19.81	-	-	8.99 c	4.38; 17.57	-	-
Female	13.26	9.23; 18.69	2.25 c	0.73; 6.71	4.96 c	1.57; 14.58	-	-	1.00 c	0.27; 3.61	-	-
Japanese	23.74	15.84; 34.00	1.83 c	0.34; 9.17	17.40 c	8.32; 32.84	-	-	19.64	11.64; 31.18	1.70 c	0.25; 0.10
Male	33.45	20.56; 49.39	2.33 c	0.26; 18.06	27.16 c	12.18; 50.06	-	-	29.65	18.97; 43.13	1.10 c	0.16; 7.42
Female	13.49 c	5.62; 28.99	1.46 c	0.11; 16.90	8.68 c	1.57; 36.15	-	-	10.84 c	2.44; 37.18	2.89 c	0.17; 34.55
Korean	25.87	18.78; 34.50	1.53 c	0.43; 5.33	16.28	10.81; 23.79	2.60 c	0.83; 7.87	13.85 c	7.31; 24.60	-	-
Male	29.51	18.02; 44.37	2.62 c	0.51; 12.40	30.84	18.36; 46.94	5.38 c	1.69; 15.85	24.49 c	10.73; 46.66	2.85 c	0.18; 31.82
Female	22.18	14.25; 32.67	-	-	3.15 c	1.76; 8.18	-	-	3.81 c	1.49; 9.39	-	-
Vietnamese	17.41	10.89; 36.66	1.23 c	0.23; 5.43	4.47 c	1.02; 17.47	1.65 c	0.11; 20.71	6.97 c	1.76; 23.82	-	-
Male	21.49 c	10.46; 39.08	-	-	8.98 c	2.00; 32.22	3.30 c	0.21; 35.42	13.44 c	2.98; 43.96	-	-
Female	14.13 c	6.46; 28.17	1.80 c	0.26; 11.50	0.00	-	-	-	-	-	-	-

	Hookah				Smokeless tobacco[b]				Pipe tobacco			
	Ever use		Past 30-day		Ever use		Past 30-day		Ever use		Past 30-day	
	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI
	Wald F = 4.54 p < .001		Wald F = 4.77 p < .001		Wald F = 10.28 p < .001		Wald F = 4.78 p < .001		Wald F = 14.91 p < .001		Wald F = .86 p = .55	
Other Asian	18.24	13.89; 24.35	3.94	2.41; 6.40	5.77[c]	3.13; 10.41	0.82[c]	0.28; 2.34	9.43	5.60; 15.31	-	-
Male	16.87	11.55; 23.98	6.11	3.36; 10.87	8.97[c]	4.41; 17.40	-	-	15.59	8.87; 25.96	-	-
Female	20.46	13.49; 29.79	2.06[c]	0.83; 5.01	3.30[c]	0.82; 12.34	1.51[c]	0.20; 10.45	4.21[c]	1.10; 14.79	-	-
NHOPI	18.73	15.92; 21.89	4.69	3.56; 6.14	10.96	6.97; 16.80	1.87[c]	0.96; 3.61	14.12	9.88; 19.78	-	-
Male	22.61	17.82; 28.25	5.98	4.19; 8.47	17.89	11.20; 27.35	3.58[c]	1.78; 7.07	19.78	12.22; 30.39	-	-
Female	15.38	12.11; 13.35	3.39	2.24; 5.11	4.36[c]	1.85; 9.96	-	-	8.55	4.51; 15.63	-	-
Non-AANHOPI	17.25	16.50; 18.04	2.16	1.98; 2.36	18.26	17.45; 19.10	3.66	3.45; 3.87	19.17	18.46; 19.89	0.93	0.83; 1.04
Male	20.28	19.30; 21.29	2.59	2.34; 2.87	31.62	30.22; 33.05	7.09	6.68; 7.52	32.68	31.35; 34.04	1.62	1.43; 1.84
Female	14.36	16.64; 15.11	1.75	1.57; 1.95	5.51	5.03; 6.03	-	-	6.23	5.68; 6.84	-	-

Respondents were categorized as ever users if they reported they had ever tried the product, even one or two times. Respondents were categorized as past 30-day users if they reported using the product at least once in the past 30 days. Italicized F-values denote p .05

AANHOPI Asian American and Native Hawaiian and Other Pacific Islander, *NHOPI* Native Hawaiian and Other Pacific Islander, *non-AANHOPI* represents respondents who are not classified as either Asian American or Native Hawaiian or Other Pacific Islander, —instances where the numerator was 0 or where value was suppressed due to counts < 3

[a] Proportions (%) are weighted to reflect the non-institutionalized, civilian US population and are adjusted by age, education, urban/rural, health insurance status, annual household income, and sexual orientation. Logistic regression analyses tested the association between AANHOPI membership and tobacco ever and past 30-day use

[b] Smokeless tobacco' reflects both snus and smokeless tobacco based on a single item with the following response choices: (1) snus pouches, and (2) loose snus, moist snuff, dip, spit, or chewing tobacco

[c] Estimate has a relative standard error that is larger than 30%. Interpret with caution