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Smoking among Asian Americans: Acculturation and Gender in the Context of Tobacco Control Policies in New York City

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Abstract

New York City (NYC) has experienced significant decline in smoking prevalence since its antismoking campaign; however, the rates among NYC's Asian communities have persisted since 2002. Using combined data from the REACH US Risk Factor Survey (2009-2011), this article examined ethnic- and gender-specific smoking behaviors and the effects of acculturation and location of residence on cigarette smoking behavior among Chinese, Korean, Asian Indians, and other Asian Americans. Results indicated that current smoking prevalence was higher for men than women among all four groups. Korean men and women had the highest current smoking rates whereas Indians had the lowest among the four subgroups. Asian American women reporting speaking only English at home had higher current smoking prevalence, but this was not observed for men. Living in Sunset Park, an emerging Asian ethnic enclave, was associated with higher odds of smoking than living in other locations in NYC. In conclusion, smoking prevalence varied across gender and ethnic subgroups among Asian Americans in NYC. A "one-size-fits-all" type of intervention strategy for "pan-Asians" could not be effective. Community-based culturally appropriate and gender-specific interventions for smoking cessation might be an option for Asian Americans residing in linguistically isolated ethnic enclaves.

Keywords

health promotion; health research; minority health; tobacco prevention and control

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INTRODUCTION

As a national leader in tobacco control policies, New York City (NYC) has adopted comprehensive smoke-free air laws and excises taxes that are more than double the U.S. average. From 2002-2010, the NYC adult smoking prevalence declined 35% from 22% to 14% (NYCDOH, November 2011). This decline, however, did not impact the Asian American populations equally. A recent *New York Times* article reported that tobacco smoking is still "a way of life" in the heart of the city's Asian American community (Maslin, 2012). The report cited statistics from the city's Department of Health and Mental Hygiene, indicating that despite decreases in smoking prevalence among every other demographic, smoking rates among Asian populations had not dropped significantly since 2002, most notably among males.

This finding in the New York Times article is counter to public perception of smoking rates in Asian American populations. Asians are reported to experience the lowest smoking rate as compared to other racial and ethnic groups (Dube et al., 2010). These findings are largely based on data from national surveys which often aggregate the many subgroups into one broad category of "Asians" and thus mask the substantial intra-group differences (Tang, Shimizu, & Chen, 2005; Trinidad, Pérez-Stable, White, Emery, & Messer, 2011). In addition, English-only questionnaires in these national surveys may also generate imprecise estimates of smoking prevalence. A substantial majority of Asian Americans are immigrants with limited English proficiency and are thus excluded from participation (Islam et al., 2010). A number of studies using community-based sampling and culturally appropriate methods, however, have found high smoking prevalence among Asian American males in several Asian ethnic groups. For example between 24%-34% smoking prevalence among Chinese American males (Ma, Shive, Tan, & Toubbeh, 2002; Shelley et al., 2004; Yu, Chen, Kim, & Abdulrahim, 2002), 27%-36% for Korean American males (Ma, et al., 2002; Tang, et al., 2005), 24.4% for Cambodian American males (Friis et al., 2012), 24.4%-40% for Vietnamese American males (Chan et al., 2007; Kim, Nguyen, & Le, 2012; Ma, et al., 2002; Tang, et al., 2005) and 24%-35% for Filipino American males (Maxwell, Garcia, & Berman, 2007; Tang, et al., 2005).

A better understanding of patterns and risks associated with tobacco use is essential for the development of culturally appropriate anti-smoking programs and successful implementation of policies to prevent or reduce smoking related morbidity and mortality among vulnerable Asian subpopulations. To this end, this epidemiologic study, guided by the social determinants of health framework, uses samples from a probability survey of Asian Americans in NYC to: (a) compare gender and ethnic-specific current smoking prevalence among Asian American subgroups (i.e. Chinese, Koreans, Asian Indians and others); (b) to estimate the differential effects of acculturation on current smoking across Asian males and females; (c) examine the independent effects of other potential predictors and thus to explore the relative importance for the design and development of culturally-appropriate smoking prevention and cessation programs. Findings from this study may inform the translation and implementation of effective tobacco control policies to curb smoking and to reduce vulnerability to tobacco-related health problems in Asian American communities.

Methodology

Study Sample

This study uses data from the REACH US Risk Factor Survey (RFS). Racial and Ethnic Approaches to Community Health Across the U.S. (REACH US) is a multi-year, community-based Centers for Disease Control and Prevention (CDC) program that mobilizes and equips local communities and institutions to plan, implement, and evaluate strategies to eliminate health disparities within underserved populations in the U.S.; each grantee partner has a specific racial and ethnic group and health focus. As part of the program's evaluation activities, the RFS is conducted annually in 28 of the grantee partner communities. For this study, we are using the data compiled from the first three years (2009-2011) of the grantee partner, NYU B Free CEED, which focused on the priority community of Asian Americans living in NYC neighborhoods. B Free CEED is a national resource and expert center committed to the elimination of hepatitis B disparities in Asian American, Native Hawaiian, and Pacific Islander communities.

The NYU B Free CEED RFS uses an address-based sampling method with geographic information systems (GIS) technology to target census tracts with high Asian American density. Surveys were administered by phone or in-person (only in the first year), or were self-administered by mail. Household screening was performed for all telephone and in-person interviews to determine the age and racial/ethnic eligibility of each household member and up to two eligible adults were selected to complete the interview. A complete description of the RFS survey design methods can be found elsewhere (Liao et al., 2011). The three years pooled NYU B Free CEED RFS sample contains 3,405 individuals. For this study, the analytical sample is restricted to the 3,215 individuals, which includes the following three major Asian subgroups: Chinese, Koreans and Asian Indians. Several other Asian American subgroups, including Cambodians, Vietnamese, Filipinos, Thai, and Laotian, are also included in the dataset; however, due to the very small sample size for each subgroup, these subgroups were aggregated to form a separate group of "Others" for the purpose of comparison with the three major subgroups in the survey.

Measures

Dependent variable—The dependent variable for this study is the current smoking status. It was assessed by asking respondents two questions: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days, or not at all?" Based on the CDC's recommended criteria (2004), current smokers were defined as individuals who reported having smoked at least 100 cigarettes in their lifetime and currently smoked every day or on some days.

Independent variables—To adequately understand the smoking behaviors among Asian subgroups, this study applies the social determinants of health framework in selecting independent variables. According to World Health Organization (WHO) (n.d.), social determinants of health are the conditions in which people are born, grow up, live, work and age, as well as the systems put in place to deal with illness. The WHO's Commission on Social Determinants of Health concluded in 2008 that the structural determinants and

conditions of daily life represent a major contribution to the health of a population (CSDH, 2008). Specific to this study, a number of social conditions, including place of residence and socioeconomic status are included in the statistical analysis along with acculturation, access to health care, and health insurance. Operationalization of the independent variables is described below.

Acculturation: Acculturation is a complex and multidimensional process "by which foreign born individuals adopt the values, customs, norms, attitudes, and behaviors of the mainstream culture" (Gordon, 1964; Shelley, et al., 2004). Acculturation has been shown to be associated with smoking among Asian Americans (An, Cochran, Mays, & McCarthy, 2008; Li & Delva, 2012; Ma et al., 2004; Rosario-Sim & O'Connell, 2009; Shelley, et al., 2004). Although there are no widely accepted acculturation measures for Asian Americans (Ma, et al., 2004), commonly used measures include English language proficiency, length of stay in the US, place of birth, and generation status. In this study, we assess levels of acculturation by two indicators: (1) languages spoken at home (English or Native Language); and (2) place of birth (U.S. vs. Foreign). One prior study found that place of birth and language spoken at home are better indicators than length of stay in the U.S. for capturing major features of acculturation conditions among Asian Americans (An, et al., 2008).

Specific to this study, we also included place of residence in NYC (Lower East Side of Manhattan or "Manhattan Chinatown", East Flushing/Central Queens, Sunset Park, and Other Locations), as this is a variable that may be closely related to acculturation. Newly arrived Chinese immigrants in NYC, for example, tended to live in the area of Sunset Park compared to more acculturated immigrants who lived in other neighborhoods. According to U.S. Census data (2011, July 11), the Chinese population in Sunset Park East grew 71 percent or from 19,963 in 2000 to 34,218 in 2010, exceeding the Chinatown in Manhattan. Location of residence may also be related to neighborhood connectedness. For example, Sunset Park is called 'Little Fuzhou' due to the influx of immigrants predominately from the Fujian Province from Mainland China.

Access to healthcare and health care coverage: Access to health care and health care coverage have been shown previously to be associated with smoking behaviors and are therefore included in our analysis (Stone, Longo, Phillips Jr, Hewett, & Riley, 2002). Access to health care was measured by a question asking respondents whether there was a time when they needed to see a doctor, but could not because of cost (yes, no).'' Health care coverage was measured by asking whether respondents had any kind of health insurance, prepaid plans such as HMOs, or government plans such as Medicare.

Food insecurity: Food insecurity has been shown to be associated with smoking behaviors (Armour, Pitts, & Lee 2008). The variable related to food insecurity was asked as how often the respondents "worry about enough money to buy nutritious meals" and was coded into three categories: always/usually, sometimes, rarely/never.

Demographics and socioeconomic status (SES): Demographic and SES variables available in the survey with possible correlates to tobacco use include age, education,

household and income (Armour, Pitts, & Lee, 2008; Cutler-Triggs, Fryer, Miyoshi, & Weitzman, 2008). Age was categorized into four groups (18 –29 years, 30–44 years, 45– 59 years, 60 years and older) based roughly on the sample distribution. Education was coded into four categories: less than high school, high school graduate, some college, college graduate and higher. Household income was coded into four categories (less than $15,000, $15,000-24999, $25,000-49,999, $50,000+). It should be noted that there are a few respondents who only reported their income less than or greater than a certain amount. For these respondents, their income was grouped into the nearest neighboring category.

Data Analysis

Data were analyzed using STATA 11.0 (StataCorp, 2009) and all analyses were weighted to account for the probability of household and individual selection in sampling design. Descriptive analyses on demographic and health characteristics and smoking prevalence were conducted on the total sample and by the Asian subpopulations. We then constructed stratified multiple logistic regression models to examine whether acculturation and other variables were associated with cigarette smoking in the entire sample and in the separate male and female samples after controlling for demographic and other covariates.

RESULTS

Demographic Characteristics

By ethnic subgroup, the RFS included 2,246 Chinese, 408 Koreans, 277 Asian Indians and 284 Other Asian Americans, respectively (Table 1). The Indians had a higher percentage of male respondents (60%) as compared with other subgroups.

The majority of Chinese respondents (53.1%) reported a household income less than $25,000. Conversely, 59.8% of Indians reported household income more than $50,000 and only 17.2% reported households having income less than $25,000. Similar patterns were found for education levels. Approximately 61% of Indians and 52% of Koreans had a college degree or higher, in comparison to 34% of Chinese. In contrast with only 6.6% of Koreans and 5.5% Indians reporting less than high school education, 31.5% Chinese had less than high school education. As for health insurance, Koreans had the highest uninsured rate (29.9%), compared to 14.3% for Chinese and 11.7% for Indians. Koreans also reported the highest percentage for food insecurity (19%) as "always/usually worrying about enough money to buy nutritious food".

With regard to the acculturation variables, the overwhelming majority of Asian Americans were foreign born, ranging from 84.2% to 91.5%. Language spoken at home varied between Asian American subpopulations. Koreans reported the highest percentage of not speaking English at home (81.3%), whereas Indians had the lowest (43.1%). Furthermore, Chinese Americans tended to concentrate in ethnic enclaves in East Flushing/Central Queens and Lower-East Side of Manhattan, and Korean Americans in East Flushing.

Smoking Prevalence among Asian Subpopulations

Overall, smoking prevalence was significantly higher among Asian males (18.5%) than females (4.4%) in the RFS sample. This gendered-pattern of smoking was also observed in each of the four subgroups. By ethnic subgroup, Korean males (35.5%) had higher cigarette smoking prevalence compared with Chinese (17.7%) and Indian males (10.1%). There were also substantial variations in current smoking among Asian women across ethnic subgroups. Specifically, among Asian Indian women, the smoking rate was as low as 0.7%, but the rate was as high as 11.2% among Korean women.

With regard to language spoken at home, for males, there was slightly higher overall prevalence of smoking among individuals speaking English at home versus other languages (often the respondents' native languages) (19.5% v. 16.2%). Notably, Korean men who spoke English at home had substantially lower smoking rate than those speaking other languages (24.0% v. 36.8%). The trend was different for females; women who spoke English at home had higher smoking rates across every ethnic subgroup. In terms of birth place, foreign born males tended to have higher smoking prevalence than their native born counterparts among the Chinese and Indian respondents. For the Korean male sample, the findings on place of birth and smoking status were inconclusive due to the smaller sample size as indicated by the large standard errors (SD=19.1). On the other hand, foreign born women had substantially lower smoking rates as compared with native born overall and across every ethnic group. For the location of residence, Asian American men living in Sunset Park had the highest smoking prevalence (38.5%), followed by East Flushing (22.9%). In contrast, Asian American women living in Sunset Park had the lowest smoking rate (1.1%).

Multiple Logistic Regression Results

Table 3 presents the multiple regression results for the combined sample and disaggregated samples by gender. Overall, compared with males, females were significantly less likely to be current smokers (odds ratio [OR]=0.20; 95% CI=0.15-0.27). Compared with respective reference groups, individuals with an annual income of more than $50,000 (OR=0.59, 95% CI =0.36-0.99), being high school or university graduates (OR=0.60, CI =0.39-0.92; OR=0.35, CI =0.22-0.55, respectively), not in the labor force (OR=0.37, CI=0.25-0.55), or covered by any type of health insurance (OR=0.60, CI=0.42-0.86) had lower odds of current smoking. Moreover, compared with Chinese Americans, Korean Americans had significantly higher odds of smoking (OR=2.89, 95% CI=1.85-4.52), and individuals who reported experiencing food insecurity had higher odds of smoking (OR=1.87, CI=1.21-2.88).

In the stratified analysis for men, except for household income which becomes insignificant, the significant associations with smoking status between demographics and socioeconomic status found in the overall sample continued to hold. For females, we found Korean women to have much higher odds of smoking (OR=4.45, CI=1.98-9.99), as well as high odds of smoking for individuals who experienced food insecurity (OR=2.09, CI=1.10-4.00). Compared with respective reference groups, females aged 45-59 (OR=0.30, CI=0.11-0.84) and those not in the labor force had lower odds of smoking (OR=0.27, CI= 0.12-0.60).

Interestingly, neither education nor income was significantly associated with smoking among females.

Acculturation was found to be differently associated with smoking in the sample populations. For females who reported English as the language spoken at home, the odds of being current smokers were 2.41 times more than those reporting other languages (mostly native languages) spoken at home. However, the language effect was not significant among males after adjustment of covariates. Another acculturation measure, birth place, was not significantly associated with smoking behavior across the entire sample or in the stratified analysis by gender. Lastly, location of residence was found to be significantly associated with smoking in the overall and the male samples. Specifically, men residing in locations other than the Sunset Park (i.e. Lower Eastside of Manhattan, East Flushing/Central Queen, and Other Locations) had significantly lower odds of smoking (OR ranging from 0.30-0.47). This association was not observed among females.

DISCUSSION

Despite being one of the fastest growing minority groups, studies of smoking among Asian Americans are limited (An, et al., 2008; Tang, et al., 2005). Moreover, many of the existing studies reporting prevalence by Asian subgroups use small ethnic or community-based samples. This study contributes to the literature by reporting the most recent overall prevalence of current smoking among Asian American populations in NYC as well as the much needed specific smoking rates disaggregated by different Asian subgroups. In addition, the address-based sampling method used in the NYU B Free CEED RFS helps reduce the potential coverage bias of traditional random-digit-dialing. Together with the pooling of multiple years of data, the sample used in this study is a very reliable proportional representation of the Asian American populations in NYC metropolitan area. Consistent with previous studies (An, et al., 2008; Ma, et al., 2004; Maxwell, Crespi, Alano, Sudan, & Bastani, 2012; Shelley, et al., 2004), our findings indicate substantial ethnic and gender differences in cigarette smoking patterns among Chinese, Korean, Indian and other Asian American populations. Men's current smoking prevalence was uniformly higher than that of females and Korean American men reported the highest current smoking rate, twice that of Chinese Americans and more than three times of Indian men. Within the Asian women population, the smoking prevalence among Korean females is the highest in the four groups studied and is almost four times that of overall smoking rate among entire sample. These results are noteworthy and reducing the smoking prevalence among these Asian American subpopulations, particularly among Korean Americans, should be a public health priority in NYC.

Prior research suggests that acculturation is negatively associated with smoking among Asian American men, but positively with Asian American women (An, et al., 2008; Choi, Rankin, Stewart, & Oka, 2008; Hofstetter et al., 2004; Kim, Ziedonis, & Chen, 2007; Zhang & Wang, 2008). Partially consistent with the literature, this study shows that the effect of acculturation indicators on smoking behaviors vary across gender among Asian Americans. Among men, neither English language spoken at home nor birth place is associated with smoking status; however, living in Sunset Park, where many are newly arrived immigrants,

poses a much higher risk to smoke than living in the more established Asian American communities, such as Flushing and Lower Manhattan. Among women whose language spoken at home is English, there is a much higher smoking prevalence, suggesting that acculturated Asian American women are more likely to smoke than traditional women. One possible explanation is that there are significantly different social norms with regard to gender and smoking between Asia and the United States (An, et al., 2008; Suinn, 2010). In many Asian countries, smoking is socially acceptable for men, but not for women; in contrast, smoking is more tolerated for women in the United States while it is less a social norm for men. Hence, less acculturated men and more acculturated women tend to have higher smoking prevalence rate.

Our results have broad policy implications for tobacco control policies that may be successful in general at population level. As scholars have recently suggested that these policies might result in differential impact on the vulnerable communities (Greaves et al., 2006; Healton, Vallone, & Cartwright, 2009; Wilson & Thomson, 2005), this study presents empirical evidence that, despite the comprehensive tobacco control policies in NYC and its success in decreasing the overall smoking rates and improving the health of the general population (Centers for Disease Control and Prevention, 2007), the non-significant declines in smoking prevalence in NYC's Asian American community require attention from researchers, practitioners and policy makers and different strategies for intervention. The study thus highlights the need for continued evaluation and assessment to ensure consistent population-wide impact of existing tobacco control policies across communities and in turn identifying strategies to strengthen and enhance the policies for vulnerable populations, including Asian American communities.

There are some possible reasons that explain why Asian American populations are less likely to respond to broad smoking control policies. First, a high percentage of Asian American immigrants are not proficient in English and many choose to reside in physically and linguistically-isolated ethnic enclaves. As a result, they are less aware of broad public health policies and are also less likely to utilize mainstream health and other city-wide resources for smoking cessation (Ma, et al., 2004). In addition, Asian Americans are historically engaged or work in small businesses, which may be missed by tobacco control policies such as workplace tobacco bans (Ma, Poon, & Toubbeh, 2008; Osypuk, Subramanian, Kawachi, & Acevedo-Garcia, 2009). Bars and restaurants owned by Asian Americans may not be uniformly enforcing tobacco control policies (Antin, Moore, Lee, & Satterlund, 2010). For example, Ma et al (2008) reported that in an assessment of businesses in Philadelphia's Chinatown, business owners' one-year post-policy implementation reported lack of in-depth knowledge of the policy and uneven implementation of the workplace smoking ban. Thus, the implementation of broad anti-smoking policies may lead to differential impacts, resulting in an unintended consequence of widening gap or inequity between Asian Americans and the general population. One solution is to utilize a twin approach coupling targeted tailored interventions specific to the Asian American communities and other vulnerable communities along with the population-wide policies to ensure consistent application and uptake of implemented policies.

Efforts to curb smoking among Asian Americans are likely complicated by the fact that the majority of Asian Americans are immigrants from countries where the smoking prevalence among men is as high as 60% and is viewed as an acceptable social norm (e.g. China and Korea). To reach vulnerable Asian American communities, effective communication messaging and initiatives on population-wide tobacco control policies that is tailored to address cultural and linguistic factors is needed. For example, one culturally and locally adapted smoking cessation intervention among Chinese and Koreans in southeastern Pennsylvania showed that 38% of participants reported quitting smoking at 3-month follow-up, and the quitting rate was even higher at 1-month follow up (Fang et al., 2006). In addition, local community members should also be mobilized to take actions that support policy change and counter pro-tobacco influences as recommended by CDC's best practices (Centers for Disease Control Prevention, 2007). Another promising method for effective policy implementation is through a participatory and collaborative process such as to ensure that vulnerable communities are engaged in the research, intervention and policy level.

Specific to NYC, our findings point to the need for tailored tobacco control initiatives and programming. Individuals residing in Sunset Park had significantly higher odds of being current smokers compared with other locations in the city. Further analysis (not shown) indicates that the majority of the samples from Sunset Park are newly arrived Chinese American immigrants with low socioeconomic status. Their smoking rates are as high as 40% compared with the overall low smoking prevalence among Chinese Americans as a whole. Thus, it is vital for public health professionals and policy makers to consider programs, such as community-based smoking cessation programs, to reach vulnerable populations living in ethnic enclaves. In addition, our findings on gender and smoking add to the growing body of converging evidence indicating that more acculturated Asian American females have a higher probability of smoking. The finding suggests potential targets for policy makers and practitioners to intervene. For example, successful tobacco control interventions and strategies targeting Asian Americans in NYC will need to be tailored on key factors including gender and language use.

Limitations and Strengths

The findings of this study should be understood with several limitations. First, in the data obtained by the RFS survey, smoking status was categorized simply as current smokers, former smokers and never smokers, with no data on the levels of addiction such as duration, intensity, or recency of smoking. Some of the findings in this study may be influenced by the extent to which individuals are addicted to smoking or at least to differences in the total number of cigarettes they may have smoked over their lives and currently smoke. Future research is needed to understand how acculturation may be associated with being addicted to smoking among the Asian subpopulations.

Second, the measurement of acculturation is tentative given the lack of any widely accepted definition for Asian Americans. For example, the use of language spoken at home may be a good indicator for Chinese and Koreans, but less so for Indians and other Asian subpopulations who may experience more English speaking in their native countries. Third, the data in this study are cross-sectional indicating that the relationships between

acculturation and smoking need to be cautiously interpreted as associations rather than causality. Fourth, the sample sizes for each of the four subpopulations were relatively small. This is not a problem when analyses were done in aggregate but small sample sizes in the subgroup analysis by gender might have resulted in large standard errors, rendering some of the estimates insignificant. More studies with larger samples of men and women from various Asian American ethnic subgroups are needed to validate the present findings.

Notwithstanding these limitations, the present study has several strengths. First, this study used an address-based probability sample surveyed in a culturally and linguistically-appropriate way, allowing the findings to be generalizable to the Asian American populations in NYC which make up 13.9% of the city's total population (Asian American Federation, 2012). Second, the pooling of multiple years of data allowed for much needed disaggregation by Asian ethnic subgroups, adding to the knowledge base of tobacco smoking among Asian American populations. Finally, the study examined the role of place of residence, and specifically ethnic enclaves, in describing tobacco use in new immigrant communities in NYC. This finding has direct policy implications for the city to design and deliver health education messages to target Asian Americans living in areas with high smoking rates.

CONCLUSION

This study examined smoking prevalence and its correlates among three main Asian American subpopulations. The findings indicate that the prevalence of smoking and effects of acculturation are context dependent, varying by ethnicity and gender. Aggregating the diverse Asian American subgroups into one monolithic group masks significant intra-group differences. The findings further suggest that a population-based approach that has successfully decreased smoking prevalence in the general population may fail in vulnerable communities who occupy marginal positions and less social capital. Instead, broad population-wide policies need to be coupled with a more community-tailored, culturally appropriate approach. Moreover, even among the Asian American population itself, a "one-size-fits-all" type of "pan-Asian" intervention strategy is not likely to be effective. Community-based, culturally tailored, and gender specific interventions for smoking cessation may be necessary to reach the most vulnerable Asian American smokers.

Acknowledgments

References

An N, Cochran S, Mays V, McCarthy W. Influence of American acculturation on cigarette smoking behaviors among Asian American subpopulations in California. Nicotine & Tobacco Research. 2008; 10(4):579–587. [PubMed: 18418780]

Antin TMJ, Moore RS, Lee JP, Satterlund TD. Law in practice: obstacles to a smokefree workplace policy in bars serving Asian patrons. Journal of Immigrant and Minority Health. 2010; 12(2):221–227. [PubMed: 18712482]

Armour BS, Pitts MM, Lee CW. Cigarette smoking and food insecurity among low-income families in the United States, 2001. American journal of health promotion. 2008; 22(6):386–392. [PubMed: 18677878]

Asian American Federation. New 2010 Census Data Show Increasing Diversity in New York City's Asian Community. 2011 Jul 11. [Press Release]. Retrieved from http://www.aafny.org/press/pressrelease.asp?prid=126&y=2011

Asian American Federation. Asian Americans in New York City:A Decade of Dynamic Change 2000-2010. New York, NY: 2012.

Centers for Disease Control and Prevention. Indicators for chronic disease surveillance. MMWR Recomm Rep. 2004; 53(RR-11):19–32.

Centers for Disease Control and Prevention. Decline in smoking prevalence, New York City, 2002–2006. MMWR Morb Mortal Wkly Rep. 2007; 56(24):604–608. [PubMed: 17585290]

Centers for Disease Control Prevention. Best practices for comprehensive tobacco control programs. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office of Smoking and Health; 2007.

Chan NL, Thompson B, Taylor VM, Yasui Y, Harris JR, Tu SP, Jackson JC, et al. Smoking prevalence, knowledge, and attitudes among a population of Vietnamese American men. Nicotine & Tobacco Research. 2007; 9:475–484.

Choi S, Rankin S, Stewart A, Oka R. Effects of acculturation on smoking behavior in Asian Americans: a meta-analysis. Journal of Cardiovascular Nursing. 2008; 23(1):67–73. [PubMed: 18158512]

CSDH. Final Report of the Commission on Social Determinants of Health. Geneva: World Health Organization; 2008. Closing the gap in a generation: health equity through action on the social determinants of health.

Cutler-Triggs C, Fryer GE, Miyoshi TJ, Weitzman M. Increased rates and severity of child and adult food insecurity in households with adult smokers. Archives of Pediatrics & Adolescent Medicine. 2008; 162(11):1056. [PubMed: 18981354]

Dube S, McClave A, James C, Caraballo R, Kaufmann R, Pechacek T. Vital signs: Current cigarette smoking among adults aged 18 years—United States, 2009. Morbidity and Mortality Weekly Report. 2010; 59:1135–1140. [PubMed: 20829747]

Fang CY, Ma GX, Miller SM, Tan Y, Su X, Shive S. A brief smoking cessation intervention for Chinese and Korean American smokers. Preventive medicine. 2006; 43(4):321–324. [PubMed: 16860858]

Friis RH, Garrido-Ortega C, Safer AM, Wankie C, Griego PA, Forouzesh M, Kuoch K, et al. Socioepidemiology of Cigarette Smoking Among Cambodian Americans in Long Beach, California. Journal of Immigrant and Minority Health. 2012; 14(2):272–280. [PubMed: 21590336]

Gordon, MM. Assimilation in American life: The role of race, religion, and national origins. Oxford University Press; USA: 1964.

Greaves L, Johnson J, Bottorff J, Kirkland S, JATEGAONKAR N, MCGOWAN M, Battersby L, et al. What are the effects of tobacco policies on vulnerable populations?: A better practices review. Canadian Journal of Public Health. 2006; 97(4):310–315. [PubMed: 16967752]

Healton CG, Vallone D, Cartwright J. Unintended Consequences of Tobacco Policies. American Journal of Preventive Medicine. 2009; 37(2):181–182. [PubMed: 19666156]

Hofstetter CR, Hovell MF, Lee J, Zakarian J, Park H, Paik HY, Irvin V. Tobacco use and acculturation among Californians of Korean descent: A behavioral epidemiological analysis. Nicotine & Tobacco Research. 2004; 6(3):481–489. [PubMed: 15203782]

Islam NS, Khan S, Kwon S, Jang D, Ro M, Trinh-Shevrin C. Methodological issues in the collection, analysis, and reporting of granular data in Asian American populations: historical challenges and potential solutions. Journal of Health Care for the Poor and Underserved. 2010; 21(4):1354–1381. [PubMed: 21099084]

Kim SS, Nguyen HL, Le TH. Culture and Smoking Among Vietnamese Americans in Central Massachusetts. Journal of Transcultural Nursing. 2012; 23(2):151–158. [PubMed: 22294338]

Kim SS, Ziedonis D, Chen KW. Tobacco use and dependence in Asian Americans: a review of the literature. Nicotine & Tobacco Research. 2007; 9(2):169–184. [PubMed: 17365748]

Li S, Delva J. Social Capital and Smoking Among Asian American Men: An Exploratory Study. Journal Information. 2012; 102(Suppl2):S212–S221.

Liao Y, Bang D, Cosgrove S, Dulin R, Harris Z, Taylor A, Giles W, et al. Surveillance of health status in minority communities-Racial and Ethnic Approaches to Community Health Across the US (REACH US) Risk Factor Survey, United States, 2009. MMWR Surveillance summaries: Morbidity and mortality weekly report Surveillance summaries/CDC. 2011; 60(6):1–44.

Ma GX, Poon AN, Toubbeh JI. Diffusion of Philadelphia's No-Smoking Policy to Chinese Businesses. American journal of health studies. 2008; 23(4):162. [PubMed: 20057915]

Ma GX, Shive S, Tan Y, Toubbeh J. Prevalence and predictors of tobacco use among Asian Americans in the Delaware Valley region. American Journal of Public Health. 2002; 92(6):1013. [PubMed: 12036798]

Ma GX, Tan Y, Toubbeh JI, Su X, Shive SE, Lan Y. Acculturation and smoking behavior in Asian-American populations. Health Education Research. 2004; 19(6):615–625. [PubMed: 15199009]

Maslin, S. For Many Asian New Yorkers, Smoking Is Still a Way of Life. New York Times. 2012. Retrieved from http://www.nytimes.com/2012/03/02/nyregion/asian-new-yorkers-resist-anti-smoking-efforts.html

Maxwell AE, Crespi CM, Alano RE, Sudan M, Bastani R. Health risk behaviors among five Asian American subgroups in California: identifying intervention priorities. Journal of Immigrant and Minority Health. 2012:1–5. [PubMed: 21590335]

Maxwell AE, Garcia GM, Berman BA. Understanding tobacco use among Filipino American men. Nicotine & Tobacco Research. 2007; 9(7):769–776. Article. 10.1080/14622200701397890 [PubMed: 17577806]

NYCDOH. Epi Data Brief: Trends in Cigarette Use Among Adults in New York City 2002-2010. New York City: Nov. 2011

Osypuk TL, Subramanian S, Kawachi I, Acevedo-Garcia D. Is workplace smoking policy equally prevalent and equally effective among immigrants? Journal of epidemiology and community health. 2009; 63(10):784–791. [PubMed: 19359272]

Rosario-Sim MG, O'Connell KA. Depression and Language Acculturation Correlate With Smoking Among Older Asian American Adolescents in New York City. Public Health Nursing. 2009; 26(6):532–542. [PubMed: 19903273]

Shelley D, Fahs M, Scheinmann R, Swain S, Qu J, Burton D. Acculturation and Tobacco Use Among Chinese Americans. American journal of public health. 2004; 94(2):300–307. [PubMed: 14759946]

StataCorp. Stata Statistical Software: Release 11. College Station, TX: StataCorp LP; 2009.

Stone TT, Longo DR, Phillips R Jr, Hewett JE, Riley SL. Health care system and insurer support for smoking cessation guideline implementation. Journal of health care finance. 2002; 29(2):78. [PubMed: 12462661]

Suinn RM. Reviewing acculturation and Asian Americans: How Acculturation Affects Health, Adjustment, School Achievement, and Counseling. Asian American Journal of Psychology. 2010; 1(1):5–17.

Tang H, Shimizu R, Chen M. English language proficiency and smoking prevalence among California's Asian Americans. Cancer. 2005; 104(12 Suppl):2982. [PubMed: 16276539]

Trinidad DR, Pérez-Stable EJ, White MM, Emery SL, Messer K. A nationwide analysis of US racial/ethnic disparities in smoking behaviors, smoking cessation, and cessation-related factors. Journal Information. 2011; 101(4)

Wilson N, Thomson G. Tobacco taxation and public health: ethical problems, policy responses. Social science & medicine. 2005; 61(3):649–659. [PubMed: 15899323]

World Health Organization. Backgrounder 3: Key concepts. n.d. Retrieved January 28, 2013, from http://www.who.int/social_determinants/final_report/key_concepts_en.pdf

Yu E, Chen E, Kim K, Abdulrahim S. Smoking among Chinese Americans: behavior, knowledge, and beliefs. American Journal of Public Health. 2002; 92:1007–1012. [PubMed: 12036797]

Zhang J, Wang Z. Factors associated with smoking in Asian American adults: A systematic review. Nicotine & Tobacco Research. 2008; 10(5):791–801. [PubMed: 18569752]

Table 1

B Free CEED RFS Survey Sample Characteristics by Asian Ethnic Subgroup, Weighted

		All Asian Americans	Chinese	Koreans	Indians	Others
Total Sample, No.		3215	2246	408	277	284
Weighted %		100 %	69.1 %	12.2 %	10 %	8.8 %
Gender, %						
	Male	49.6	48.2	51.2	60.0	47.0
	Female	50.4	51.8	48.8	40.0	53.0
Age in years, %						
	18/29	20.4	21.6	16.7	21.5	14.9
	30/44	26.9	23.7	35.4	31.9	34.0
	45/59	26.0	25.4	24.0	28.1	30.8
	60+	26.8	29.3	23.9	18.5	20.4
Household income in $, %						
	0/14,999	27.6	31.0	26.7	7.8	25.0
	15,000/24,999	19.2	22.1	14.8	9.4	14.5
	25,000/49,999	23.1	22.6	26.4	23.0	22.5
	50,000+	30.1	24.3	32.1	59.8	37.9
Education, %						
	<High School	24.7	31.5	6.6	5.5	18.1
	High School	18.3	18.8	21.6	14.2	14.9
	Some college	16.4	15.8	19.9	19.1	13.9
	University & above	40.6	34.0	51.9	61.3	53.1
Employment, %						
	Employed	53.9	50.2	59.9	68.3	59.0
	Unemployed	9.8	10.0	9.2	8.9	10.1
	Not in labor force	36.3	39.9	30.9	22.8	30.9
Health care coverage, %						
	No	16.2	14.3	29.9	11.7	17.6
	Yes	83.8	85.8	70.1	88.3	82.4
Food insecurity, %						

	All Asian Americans	Chinese	Koreans	Indians	Others
Rarely/Never	69.7	72.1	56.2	73.6	65.0
Sometimes	19.4	18.4	24.5	16.3	23.7
Always/Usually	10.9	9.5	19.3	10.1	11.3
Self-rated health, %					
Poor/fair	29.5	35.2	15.6	14.2	21.6
Excellent/good	70.5	64.8	84.4	85.9	78.4
Birthplace, %					
U.S.	14.1	15.3	8.5	15.8	10.8
Foreign	85.9	84.7	91.5	84.2	89.2
Language spoken at home, %					
Native	69.2	72.8	81.3	43.1	53.9
English	30.8	27.2	18.7	56.9	46.1
Location of residence, %					
Sunset Park	5.5	7.2	0.3	1.0	4.5
Lower Eastside of Manhattan	40.5	56.2	1.2	1.4	15.8
East Flushing/Central Queens	34.1	31.0	80.3	7.5	24.0
Other locations	19.9	5.6	18.3	90.1	55.8

Table 2

Smoking Prevalence Across Acculturation Indicators, by Gender and Ethnicity

Acculturation Variables	Overall	Chinese	Koreans	Indians	Others
Male					
Overall smoking rate (%)	18.5(1.1)	17.7(1.3)	35.5(3.8)	10.1(2.7)	11.0(3.0)
Language spoken at home					
English	19.5(1.4)	18.0(2.7)	24.0(9.6)	11.6(3.9)	11.0(4.8)
Other	16.2(2.0)	17.6(1.6)	36.8(4.3)	9.6(4.2)	11.4(4.0)
Birthplace					
U.S.	10.5(2.5)	8.0(2.5)	46.0(19.1)	11.3(6.3)	14.1(12.8)
Foreign	19.8(1.2)	19.6(1.5)	34.9(3.9)	9.9(3.0)	10.8(3.1)
Location of residence					
Sunset Park	38.5(6.4)	40.1(6.8)	0.00	0.00	27.5(22.3)
Lower Eastside of Manhattan	15.7(1.7)	15.7(1.7)	0.00	50.0(35.4)	9.5(8.9)
East Flushing/Central Queen	22.9(2.1)	17.0(2.4)	35.5(4.2)	25.6(15.0)	15.1(7.3)
Other locations	12.0(2.0)	12.4(4.5)	33.7(9.0)	8.5(2.6)	9.3(3.4)
Female					
Overall smoking rate (%)	4.4(0.5)	3.6(0.5)	11.2(2.3)	0.7(0.7)	5.7(1.9)
Language spoken at home					
English	8.2(1.3)	8.4(1.6)	16.6(5.7)	1.4(1.4)	8.7(3.5)
Other	2.9(0.5)	1.9(0.5)	10.3(2.6)	0.00	3.6(2.1)
Birthplace					
U.S.	12.1(2.2)	9.9(2.3)	20.9(8.3)	6.2(6.1	25.0(11.0)
Foreign	3.2(0.5)	2.5(0.5)	9.8(02.3)	0.00	3.1(1.4)
Location of residence					
Sunset Park	1.1(0.02)	1.3(1.3)	0.00	0.00	0.00
Lower Eastside of Manhattan	4.8(0.8)	4.0(0.8)	20.0(17.9)	0.00	24.8(9.0)
East Flushing/Central Queen	5.1(0.9)	3.3(0.9)	11.2(02.6)	0.00	0.00
Other locations	3.0(1.0)	3.2(2.3)	10.6(05.0)	0.9(0.9)	2.4(1.7)

Table 3

Weighted Logistic Regression Analyses of Current Smoking, by Gender*

	Odds Ratio [95% Confidence Interval]		
	Entire Sample (N=2,581)	Male (N=1,139)	Female (N=1,442)
Female (ref: Male)	**0.20 (0.15-0.27)**	n/a	n/a
Ethnicity (ref: Chinese)			
Koreans	**2.89 (1.85-4.52)**	**2.18 (1.27-3.76)**	**4.45 (1.98-9.99)**
Indians	0.73(0.33-1.63)	0.71(0.28-1.82)	0.48(0.06-3.76)
Others	0.99(0.52-1.89)	0.59(0.26-1.34)	1.95(0.73-5.16)
Age in years (ref: 18-29)			
30/44	1.04(0.63-1.72)	1.40(0.72-2.70)	0.72(0.33-1.56)
45/59	0.87(0.52-1.45)	1.36(0.70-2.62)	**0.30 (0.11-0.84)**
60+	0.77(0.46-1.27)	1.04(0.55-1.95)	0.35(0.12-1.06)
Household income in $ (ref: <15,000)			
15,000-24,999	0.79(0.52-1.19)	0.92(0.57-1.50)	0.33(0.13-0.85)
25,000-49,999	0.72(0.47-1.11)	0.74(0.44-1.25)	0.57(0.25-1.27)
50,000	**0.59 (0.36-0.99)**	0.60(0.32-1.11)	0.53(0.20-1.36)
Education (ref: <High school)			
High school graduate	**0.60 (0.39-0.92)**	**0.57 (0.34-0.93)**	0.63(0.17-2.31)
Some college	0.68(0.43-1.07)	0.48(0.28-0.84)	2.07(0.79-5.44)
University graduate and above	**0.35 (0.22-0.55)**	**0.25 (0.14-0.44)**	0.92(0.32-2.62)
Employment (ref: Employed)			
Unemployed	0.79(0.51-1.23)	0.85(0.51-1.43)	0.44(0.16-1.24)
Not in labor force	**0.37 (0.25-0.55)**	**0.44 (0.27-0.72)**	**0.27 (0.12-0.60)**
Food insecurity (Ref: Never/Seldom)			
Somewhat stressful	1.38(0.97-1.97)	1.29(0.82-2.00)	**2.09 (1.10-4.00)**
Always stressful	**1.87 (1.21-2.88)**	**1.94 (1.14-3.30)**	1.55(0.70-3.43)
Insurance (ref: Have any type of health insurance)	**0.60 (0.42-0.86)**	**0.56 (0.36-0.88)**	0.73(0.36-1.46)
Self-rated health: Poor/fair (ref: Excellent/good)	1.15(0.82-1.62)	1.14(0.76-1.71)	1.13(0.52-2.46)
Location of residence (ref: Sunset Park)			
East Flushing/Central Queen	**0.45 (0.26-0.79)**	**0.30 (0.15-0.57)**	2.83(0.35-22.94)
Lower Eastside of Manhattan	**0.54 (0.30-0.96)**	**0.47 (0.24-0.93)**	1.71(0.21-14.19)
Other locations	**0.34 (0.17-0.70)**	**0.35 (0.15-0.82)**	0.85(0.09-7.75)
Birthplace (ref: Born in the U.S.)	0.74(0.45-1.21)	1.00(0.51-1.94)	0.50(0.21-1.17)
English spoken at home (ref: Other languages spoken at home)	**1.57(1.12-2.19)**	1.32 (0.89-1.98)	**2.41 (1.32-4.42)**

Notes:

*
Bold indicates statistically significant odds ratio (p<0.05).