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BRIEF REPORT

Increases in Light and Intermittent Smoking Among Asian Americans and Non-Hispanic Whites

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ABSTRACT

Introduction: Asian Americans are the fastest growing immigrant group in the United States and are more likely to be light and intermittent smokers (LITS) compared with non-Hispanic Whites (NHWs). LITS experience adverse health effects related to smoking. Previous research has aggregated Asian American ethnic groups, masking important differences between groups. We sought to compare LITS rates before and after the 1998 Master Settlement Agreement (MSA) among Asian American subgroups and NHWs in California utilizing data from the California Tobacco Surveys (CTS).

Methods: Combined 1990, 1992, and 1996 CTS (pre-MSA) and the 1999, 2002, 2005, and 2008 CTS (post-MSA) to examine changes in LITS (<10 cigarettes/day or not smoking daily). Chinese, Filipino, Japanese, and Korean ethnic groups were compared with NHWs.

Results: Pre-MSA logistic regression models adjusted for age, gender, education level, language spoken at home, and use of other tobacco products found that Chinese (odds ratio [OR] = 3.38, 95% confidence interval [CI] = 2.19, 5.21), Filipinos (OR = 3.55, 95% CI = 2.73, 4.63), Japanese (OR = 1.99, 95% CI = 1.22, 3.27), and Koreans (OR = 3.22, 95% CI = 2.06, 5.03) were significantly more likely to be LITS than NHWs. Post-MSA, all Asian American subgroups experienced an increase in LITS (11.7%–37.8%); however, only Chinese (OR = 2.19, 95% CI = 1.16, 4.13) and Filipinos (OR = 3.33, 95% CI = 2.26, 4.91) remained significantly more likely to be LITS than NHWs.

Conclusions: Results highlight the need for tobacco control efforts addressing the growing list of LITS for Asian Americans and NHWs.

INTRODUCTION

Asian Americans are proportionately the fastest growing immigrant group in the United States, increasing by 43% from 2000 to 2010 (Hoeffel, Rastogi, Kim, & Shahid, 2012). The leading causes of death among Asian Americans have been related to smoking, including cancer, heart disease, and stroke (Heron, 2012; Ockene & Miller, 1997). These adverse health effects, particularly cardiovascular disease, are also important for light and intermittent smokers (LITS; Bjartveit & Tverdal, 2005; Pope et al., 2009). Approximately one fifth of U.S. smokers are LITS (Centers for Disease Control and Prevention, 2008), and the number is projected to continue increasing in the coming years (Fagan & Rigotti, 2009; Schane, Ling, & Glantz, 2010). California leads the nation with over one third of its smokers to be LITS than non-Hispanic Whites (NHWs; Benowitz, 2014. Published by Oxford University Press on behalf of the Society for Research on Nicotine and Tobacco. All rights reserved. For permissions, please e-mail: journals.permissions@oup.com.

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number of important changes in tobacco control including advertisement restrictions on tobacco, tax increases, monetary funds for advocacy groups, and the making of tobacco industry documents available to the public (Sloan & Trogdon, 2004; State of California Department of Justice, 2012; Sung, Hu, Ong, Keeler & Sheu, 2005). The MSA represents a significant event in tobacco control and is therefore used as a specific time point to divide the data and examine differences in smoking behaviors. We hypothesized that rates of LITS would increase after the MSA, with significantly higher proportions of Asian American ethnic groups being LITS compared with NHWs. Examining LITS before and after the MSA among Asian American ethnic groups will provide valuable information to practitioners, policy makers, and public health officials in focusing tobacco control efforts.

METHODS

The CTS are representative population surveys of adults in California conducted approximately every 3 years from 1990 to 2008 (Al-Delaimy, Edland, Pierce, Mills, & White, 2009). Data collected from these surveys were analyzed in 2013. Pre-MSA data (n = 41,398) included individuals who self-identified as Japanese (n = 472), Chinese (n = 565), Filipino (n = 967), Korean (n = 178), and NHWs (n = 39,216). Data from post-MSA (n = 37,035) included Japanese (n = 713), Chinese (n = 1,404), Filipino (n = 1,342), Korean (n = 305), and NHWs (n = 33,271). All surveys were conducted in English. Data from 1990, 1992, and 1996 (pre-MSA) were combined and compared with data from 1999, 2002, 2005, and 2008 (post-MSA) to examine changes in LITS prior to and after the MSA. Although response rates for the CTS have declined over time, analyses indicate sample sizes have been representative of the California population (Al-Delaimy et al., 2009).

Respondents were classified as ever-smokers if they responded “yes” to “Have you ever smoked 100 cigarettes?” Ever-smokers were further asked, “Do you now smoke every day, some days, or not at all?” and classified into daily smokers, intermittent smokers, and former smokers, respectively. LITS includes daily smokers who smoked fewer than 10 cigarettes a day and intermittent smokers. Demographic measures included age (18–34, 34–49, 50–64, and 65+), gender, educational level (less than high school, high school graduate, some college or vocational school, and college graduate or higher), self-reported race/ethnicity, and language spoken at home (English or all other).

Data were analyzed using SAS version 9.3 (SAS Institute Cary, NC). The CTS data include sets of replicate survey weights for use with jackknife procedures (Efron, 1982). Estimates were weighted accounting for selection probabilities and adjusted for survey nonresponse (Bureau of Labor Statistics, U.S. Census Bureau, 2002). Demographic information, including the variance estimates, was calculated using SAS Proc SurveyMeasures and Surveyfreq. Two logistic regression models were fit (pre-MSA and post-MSA) to compare LITS between Asian American groups and NHWs. Models were adjusted for use of other tobacco products and potential demographic confounders, including age, level of education, gender, and language spoken at home. The logistic regressions were conducted using SAS Proc SurveyLogistic. Further methodological information for the CTS is described elsewhere (Al-Delaimy et al., 2011).

RESULTS

Demographic characteristics and smoking prevalence rates for Asian American ethnic groups are presented in Table 1. Pre-MSA, there were statistically significant larger proportions of LITS among Chinese (63.2%, 95% confidence interval [CI] = 58.2, 68.3), Filipinos (62.3%, 95% CI = 59.1, 65.4), Japanese (49.3%, 95% CI = 43.7, 55.1), and Koreans (67.3%, 95% CI = 62.7, 71.9) compared with NHWs (33.1%, 95% CI = 32.7, 34.0). All Asian American ethnic groups (Chinese: 76.2%, 95% CI = 70.5, 81.8; Filipino: 75.9%, 95% CI = 72.7, 79.2; Japanese: 67.9%, 95% CI = 62.1, 73.6; Korean: 75.2%, 95% CI = 69.7, 80.6) and NHWs (49.1%, 95% CI = 48.4, 49.8) experienced an increase in LITS rates post-MSA. The factor increase from pre-MSA to post-MSA was 20.4% for Chinese, 21.9% for Filipinos, 37.8% for Japanese, 1.7% for Koreans, and 48.2% for NHWs (see Figure 1).

After adjusting for potential demographic confounders in pre-MSA analyses, Chinese (odds ratio [OR] = 3.38, 95% CI = 2.19, 5.21; p < .001), Filipinos (OR = 3.55, 95% CI = 2.73, 4.63; p < .001), Japanese (OR = 1.99, 95% CI = 1.22, 3.27; p < .005), and Koreans (OR = 3.22, 95% CI = 2.06, 5.03; p < .001) were significantly more likely to be LITS compared with NHWs. Post-MSA, only Chinese (OR = 2.19, 95% CI = 1.16, 4.13; p < .05) and Filipinos (OR = 3.33, 95% CI = 2.26, 4.91; p < .001) had significantly higher LITS rates than NHWs (Japanese: OR = 1.78, 95% CI = 0.94, 3.38; p > .05; Korean: OR = 1.36, 95% CI = 0.70, 2.64, p > .05).

DISCUSSION

To our knowledge, this is the first study to examine trends in LITS among Asian American groups since the 1990s. Although studies have examined smoking rates in Chinese, Filipino, Japanese, and Koreans cross-sectionally, none have examined smoking rates across these various groups over a 20-year period. Pre-MSA, all Asian American groups were more likely to be LITS than NHWs, similar to previous research (Benowitz et al., 2002; Fagan & Rigotti, 2009; Maxwell et al., 2012; Tong et al., 2009; Trinidad et al., 2011). Post-MSA, LITS rates increased for all Asian American groups and NHWs. However, the increase for NHWs was more pronounced such that only Chinese and Filipinos were significantly more likely to be LITS than NHWs by 2008. The distinct increase in LITS among all racial/ethnic groups examined is a unique finding, and a shift from heavy smoking to LITS is evident in the current results and demonstrates a changing smoking topography. Policies associated with the MSA, such as tax increases on cigarettes and other changes in tobacco control in California, such as clean air laws, have been shown to reduce smoking prevalence and consumption in smokers (Chaloupka, Straif, & Leon, 2011; Gilpin, Farkas, Emery, Ake, & Pierce, 2002) and likely contributed to the increase in LITS. These findings highlight the importance of focusing future tobacco control efforts on LITS.

Asian Americans are more likely to be LITS (Hassmiller, Warner, Mendez, Levy, & Romano, 2003; Wortley, Hunt, Kroesci, Christmon, & Pederson, 2003), and LITS have been shown to have increased aspirations to quit smoking (Tong et al., 2009; Tong, Ong, Vittinghoff, & Pérez-Stable, 2006). However, tobacco cessations programs specific to Asian Americans, particularly LITS, are relatively sparse (Lawrence, Graber, Mills, Meissner, & Warnecke, 2003) and are therefore
Table 1. Demographic Characteristics and Smoking Prevalence of Asian American Ethnic Groups

<table>
<thead>
<tr>
<th></th>
<th>Japanese</th>
<th>Chinese</th>
<th>Filipino</th>
<th>Korean</th>
<th>Non-Hispanic Whites</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>% CI</td>
<td>N</td>
<td>% CI</td>
<td>N</td>
</tr>
<tr>
<td>Pre-Master Settlement Agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>472</td>
<td>565</td>
<td>967</td>
<td>178</td>
<td>39,216</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>233</td>
<td>51.3</td>
<td>309</td>
<td>47.8</td>
<td>541</td>
</tr>
<tr>
<td>Age, years (M, SD)</td>
<td>47.7</td>
<td>1.1</td>
<td>36.5</td>
<td>0.5</td>
<td>41.2</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>20</td>
<td>12.9</td>
<td>17</td>
<td>4.9</td>
<td>57</td>
</tr>
<tr>
<td>High school</td>
<td>125</td>
<td>31.1</td>
<td>73</td>
<td>8.9</td>
<td>196</td>
</tr>
<tr>
<td>Some college</td>
<td>163</td>
<td>27.8</td>
<td>180</td>
<td>29.9</td>
<td>357</td>
</tr>
<tr>
<td>College graduate</td>
<td>164</td>
<td>28.7</td>
<td>295</td>
<td>45.3</td>
<td>357</td>
</tr>
<tr>
<td>Ever-smokers</td>
<td>318</td>
<td>43.9</td>
<td>254</td>
<td>18.3</td>
<td>601</td>
</tr>
<tr>
<td>Current smokers</td>
<td>164</td>
<td>17.1</td>
<td>132</td>
<td>7.5</td>
<td>331</td>
</tr>
<tr>
<td>Smoking consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LITS</td>
<td>83</td>
<td>49.3</td>
<td>91</td>
<td>63.2</td>
<td>218</td>
</tr>
<tr>
<td>Daily, &gt;10</td>
<td>82</td>
<td>50.7</td>
<td>43</td>
<td>36.8</td>
<td>115</td>
</tr>
<tr>
<td>Post-Master Settlement Agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>713</td>
<td>1,404</td>
<td>1,342</td>
<td>305</td>
<td>33,271</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>302</td>
<td>44.4</td>
<td>689</td>
<td>49.3</td>
<td>640</td>
</tr>
<tr>
<td>Age, years (M, SD)</td>
<td>52.1</td>
<td>0.9</td>
<td>42.0</td>
<td>0.5</td>
<td>43.6</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>12</td>
<td>4.4</td>
<td>20</td>
<td>3.1</td>
<td>48</td>
</tr>
<tr>
<td>High school</td>
<td>118</td>
<td>24.3</td>
<td>140</td>
<td>12.8</td>
<td>229</td>
</tr>
<tr>
<td>Some college</td>
<td>225</td>
<td>27.0</td>
<td>355</td>
<td>19.2</td>
<td>513</td>
</tr>
<tr>
<td>College graduate</td>
<td>358</td>
<td>44.3</td>
<td>879</td>
<td>65.0</td>
<td>541</td>
</tr>
<tr>
<td>Ever-smokers</td>
<td>320</td>
<td>35.3</td>
<td>339</td>
<td>19.4</td>
<td>540</td>
</tr>
<tr>
<td>Current smokers</td>
<td>130</td>
<td>8.0</td>
<td>154</td>
<td>6.3</td>
<td>273</td>
</tr>
<tr>
<td>Smoking consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LITS</td>
<td>84</td>
<td>67.9</td>
<td>111</td>
<td>76.2</td>
<td>200</td>
</tr>
<tr>
<td>Daily, &gt;10</td>
<td>41</td>
<td>32.1</td>
<td>40</td>
<td>23.8</td>
<td>68</td>
</tr>
</tbody>
</table>

Figure 1. Rates of light and intermittent smoking among California Asian American Groups and non-Hispanic Whites, before and after the Master Settlement Agreement, California Tobacco Surveys 1990–2000.

much needed. The CTSs were conducted in English and not language of origin, so the Asian American groups represented here may be more acculturated rather than those with limited English proficiency. Analyses using the California Health Interview Survey (CHIS) conducted in native languages found higher rates of LITS among Asian Americans compared with
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NHWs (Tong et al., 2009), which support the current study's pre-MSA (1998–2008) findings. Nonetheless, there may be significant differences for Asian American groups that have limited English proficiency.

Some other limitations should be noted. CTS data were obtained by self-report, and information on smoking status was not biochemically validated. Small sample sizes did not provide ample statistical power to examine other Asian ethnic groups separately (e.g., Vietnamese) or gender differences within the groups examined. This population reflects California only, where smoking prevalence is lower for Asian Americans than in non-Western regions (Chae, Gavin, & Takeuchi, 2006). Future studies should take these factors into consideration. Differences between daily light smokers and nondaily smokers may reflect upon diverse social and cultural contexts. Further research should examine immigration status and extraneous social and cultural factors that influence smoking behavior among disaggregated Asian groups. Examining such research could help explain why Chinese and Filipinos were significantly more likely than NHWs to be LITS post-MSA.

Since the 1990s, LITS has increased by 29% in California (Gilpin et al., 2003). Shifts in smoking consumption patterns, from heavy daily smoking to LITS, have been associated with tobacco control policies enacted after the MSA (Schane, Glantz, & Ling, 2009; Shiffman, 2009). Increasing rates of LITS is a growing concern to tobacco control practitioners, policy makers, and public health professionals as efforts to reduce smoking in such groups present a significant challenge because they may be less likely to consider or label themselves as “smokers” (Schane et al., 2010). In order to address LITS, research should examine environmental and social cues that reinforce the desire to smoke (Shiffman, 2009) because LITS do not seem to be driven by nicotine withdrawal (Tindle & Shiffman, 2011). Furthermore, nondaily Asian American smokers have reported less medical provider advice to quit smoking than daily smokers (Tong, Tang, Chen, & McPhee, 2011). With the adverse health effects related to LITS (Bjartveit & Tverdal, 2005; Pope et al., 2009) and high LITS rates among Asian Americans, it is important that future efforts focus on LITS within this population. Tailored cessation programs, physician advice, and increases and reinforcement in tobacco taxes policies resulting from the MSA may influence smoking behaviors. Future research should focus on addressing factors associated with LITS among disaggregated ethnic groups. Although California has made great strides in tobacco control and has experienced a faster decline in cigarette smoking compared with the rest of the United States (Cowling & Yang, 2010), this study highlights the need for focused tobacco control efforts to address this growing group of smokers not just for Asian Americans, but also for NHWs.

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REFERENCES


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DECLARATION OF INTERESTS

None declared.


