

## RESEARCH ARTICLE

## Compliance with Smoke-Free Policies in Korean Bars and Restaurants in California: a Descriptive Analysis

Veronica L Irvin<sup>1&\*</sup>, C Richard Hofstetter<sup>2</sup>, Jeanne F Nichols<sup>3</sup>, Christina D Chambers<sup>4</sup>, Paula M Usita<sup>5</sup>, Gregory J Norman<sup>6</sup>, Sunny Kang<sup>7</sup>, Melbourne F Hovell<sup>7</sup>

### Abstract

**Background:** Compliance with California's smoke-free restaurant and bar policies may be more a function of social contingencies and less a function of legal contingencies. The aims of this study were: 1) to report indications of compliance with smoke-free legislation in Korean bars and restaurants in California; 2) to examine the demographic, smoking status, and acculturation factors of who smoked indoors; and 3) to report social cues in opposition to smoking among a sample of Koreans in California. **Materials and Methods:** Data were collected by telephone surveys administered by bilingual interviewers between 2007-2009, and included California adults of Korean descent who visited a Korean bar or restaurant in a typical month (N=2,173, 55% female). **Results:** 1% of restaurant-going participants smoked inside while 7% observed someone else smoke inside a Korean restaurant. Some 23% of bar-going participants smoked inside and 65% observed someone else smoke inside a Korean bar. Presence of ashtrays was related to indoor smoking in bars and restaurants. Among participants who observed smoking, a higher percentage observed someone ask a smoker to stop (17.6%) or gesture to a smoker (27.0%) inside Korean restaurants (N=169) than inside Korean bars (n=141, 17.0% observed verbal cue and 22.7% observed gesture). Participants who smoked inside were significantly younger and more acculturated than participants who did not. Less acculturated participants were significantly more likely to be told to stop smoking. **Conclusions:** Ten years after implementation of ordinances, smoking appears to be common in Korean bars in California.

**Keywords:** Korean - tobacco - smoking - acculturation - restaurant - bar

*Asian Pac J Cancer Prev*, 16 (3), 1083-1089

### Introduction

California implemented smoke-free ordinances for restaurants in 1995 and for bars in 1998. Two years after implementation, compliance was high with only 14% of patrons reporting that they smoked and 20% observing others smoking inside bars in California (Tang et al., 2003). However, not all establishments enforce the ordinance. This study investigated compliance with smoke-free ordinances inside Korean bars and restaurants in California.

Smoke-free ordinances are presumably enforced by social contingencies because legal enforcement is rare (Hofstetter et al., 2010). Legal enforcement is a complaint-driven system with complex administrative structures that issue low dollar fines at a low probability rate (Satterlund et al., 2009). Compliance is less likely in venues that serve

communities with high prevalence of smoking; staff may allow regular patrons to smoke inside (Lee et al., 2008). Smokers may violate smoking restrictions if they perceive smoking as acceptable and non-smokers' assertiveness as low (Lazuras et al., 2009).

Direct observation after the ordinance revealed that 82% of Asian bars in California and 100% of bars in Koreatown (Los Angeles) allowed smoking indoors (Antin et al., 2010; Lee et al., 2008). The financial and social consequences of asking patrons to not smoke may outweigh the health and legal consequences (Antin et al., 2010). Korean males in the U.S. are sensitive to the diminishing social acceptability and may interpret their surroundings before smoking inside certain venues (Kim et al., 2005).

Smoking is socially important for Korean males, where social ties may be lost if one quits (Kim et al., 2005). Over

<sup>1</sup>School of Social and Behavioral Health Sciences, College of Public Health and Human Sciences, Oregon State University, Corvallis, <sup>2</sup>Department of Political Science, San Diego State University; and Center for Behavioral Epidemiology and Community Health, Graduate School of Public Health, <sup>3</sup>School of Exercise and Nutritional Sciences, <sup>7</sup>Center for Behavioral Epidemiology and Community Health, Graduate School of Public Health, San Diego State University, <sup>4</sup>Department of Pediatrics, <sup>6</sup>Department of Family and Preventive Medicine, University of California, San Diego, <sup>5</sup>Brotherton and Associates, Poway, USA. \*For correspondence: veronica.irvin@oregonstate.edu

30% of Korean males in California smoke, which is double the prevalence of California adult males (Hofstetter et al., 2004; An et al., 2008). A qualitative analysis of Korean young adult smokers in California revealed that gender differences in smoking prevalence continue to persist even with increased familiarity to American language and culture. There is easy access to cigarettes in the home and a high rate of smoking in Korean communities in California which leads to the acceptability of smoking as well as multiple opportunities to engage in smoking (Huh et al., 2013). Korean American smokers also reported a sense of invincibility in terms of smoking and health and were resistant to the ideas that smoking harmed health (Huh et al., 2013).

In contrast to the high smoking prevalence, adoption of smoke-free policies is fairly high among Korean Americans in California. Tong et al reported that the majority of Korean and Chinese women in California had adopted smoke-free policies at home (58%) and at work (90%) (Tong et al., 2009). Hughes et al reported that the percentage of Korean households in California with a complete home ban increased from 59% to 84% between 2001-2007 (Hughes et al., 2009). However both studies reported difficulty in complying with smoke-free policies. Tong et al. (2009) reported that lower-educated women were more likely to report someone smoking inside their home and may have felt intimidated to enforce their rights to a smoke-free environment. Hughes et al. (2009) reported that participants found it difficult to ask their parent-in-law not to smoke inside their home. Non-smokers may be reluctant to confront smokers because culture dictates to be polite and not damage relationships (Hughes et al., 2011). This same result of high adoption but low compliance may translate into the smoke-free policies of public buildings primarily frequented by Koreans.

The aims of this study are: 1) to report indications of compliance with smoke-free legislation in Korean bars and restaurants in California; 2) to examine the demographic, smoking status and acculturation factors of who smoked indoors; and 3) to report social cues in opposition to smoking among a sample of Koreans in California.

## Materials and Methods

Data were collected from population based probability samples of adults of Korean descent residing in California (18 years or older) who were interviewed by telephone. Two independent cohorts were sampled, interviewed and follow-ed up. The first cohort was recruited in 2005-2006 and the second cohort in 2007-2009 (Hofstetter et al., 2004; Hofstetter et al., 2010). Each cohort was re-interviewed in 2007-2009. Procedures were approved by the San Diego State University Institutional Review Board.

A commercially available electronic database of telephone numbers in California was compiled from telephone directories, purchased memberships, subscriptions, voting registration lists, warrantee lists, and other sources. This database included both listed and unlisted phone numbers. Persons with Korean surnames were abstracted. The list was then purged of Korean

surnames that overlapped with other nationalities (e.g., Ho, Cho) when the first name on the list was clearly of non-Korean nationality (e.g., Chinese) but not purged if the first name occurred among Koreans or non-Chinese. This list was randomized for interviewing, and interviewers screened households to insure that at least one adult of Korean descent was a resident. Stratified by gender, adults who reported Korean descent were selected randomly in each household using the most recent birthday procedure. Non-respondents were recalled at least two times. This procedure was conducted twice - once in 2001 and the second in 2005 to generate two independent, sampling frames.

For the first cohort, the sample included 108,843 telephone numbers. Study interviewers made contact with 13,357 persons of which 10,061 were excluded because they were not of Korean descent or because the phone number belonged to a business. A total of 3,294 households qualified and 2,830 completed the interview for a participation rate of 86%. See Hofstetter et al, 2004 for further details. A similar distribution was observed for the second cohort with details available in Hofstetter et al, 2010. A total of 281,377 listed and unlisted telephone numbers were generated with common Korean surnames. Study interviewers contacted 20,921 households and determined that 18,469 were not of Korean descent. A total of 2,452 household were qualified of which 367 refused and 2085 completed the interview for a participation rate of 85%.

Each cohort was re-interviewed in 2007-2009. We could not locate 1,575 participants from cohort 1 and 562 participants from cohort 2. Of the participants who we could still locate (n=1255 from cohort 1 and n=1523 from cohort 2), 95% completed the follow-up survey for a total of 2,639 interviews. Only data from the interview conducted in 2007-2009 is included in this manuscript because it was the only interview that asked about smoking in bars and restaurants. Therefore only cross-sectional analyses are permitted. Inclusion criteria for this manuscript are: Person of Korean descent, resident of California, and 18 years of age or older (N=2,639). Only participants who visited a Korean bar or restaurant at least once in a typical month are retained in this manuscript (N=2,173).

### *Interview and cohort maintenance procedures.*

Interviews were introduced in the language that the participant used to answer the telephone (Korean or English), and subsequently in the participant's language of preference, and conducted by bilingual professional interviewers who had been thoroughly trained and were closely supervised. Up to 15 attempts were made to complete follow up interviews using callbacks at different times and days of the week. Cash incentives of \$10 were paid for initial interviews and \$15 for follow-up interviews. Personalized Korean Thanksgiving (September) and Lunar New Year (late January or early February) cards were mailed by first class postage (to enable forwarding and returned cards) to all participants. Participants who provided the project with an updated telephone number or address were given a \$5 incentive. A

toll-free telephone number, project website and magnets with project information were sent to participants who contacted the project at any time during the study. Tracking information included mailing addresses, e-mail addresses, business or cell phone numbers, alternate friends or relatives and names and locations of the churches attended.

**Measures:** Verbatim wording including translations is available online in the appendices.

**Observed smoking in venue:** Participants were asked if they smoked, others in their group smoked, and whether any other persons smoked inside the bar. Variables created were 1) participant smoked indoors; 2) others in the group smoked indoors; and 3) others in the bar smoked indoors. These questions were repeated for a Korean restaurant and corresponding variables created.

**Social cues to stop smoking:** Participants were asked if they observed anyone tell a smoker to stop smoking or gesture opposition to smoking. If yes, they were asked who provided the cue to quit smoking. Social cues were coded as those 1) observed, 2) received, or 3) given by participant.

**Observed ashtrays and signs:** Participants were asked if they saw any ashtrays or “no-smoking” signs inside Korean bars and restaurants.

**Acculturation:** Acculturation was measured by a 10-item scale of language, culture, social ties plus percent of life and education in the U.S. (Hofstetter et al., 2010; Suinn et al., 1992). After conversion to a common metric (Z-scores), a mean of the items was computed (Cronbach’s  $\alpha=.91$ ). A logarithm transformation was computed to constrain skewness. Higher scores represent higher acculturation and lower scores represent stronger identification with traditional culture.

**Smoking status:** Participants were coded as never,

former or current smokers based off two questions (a) “Have you smoked at least 100 cigarettes during your lifetime?” and (b) “Do you now smoke cigarettes every day, some days, or not at all?” (CDC, 2007). Current smokers were defined as those who reported smoking every day or some days and who had smoked at least 100 cigarettes in their lifetimes. Former smokers had smoked 100 cigarettes but were not currently smoking.

#### Demographics

Country of birth, age, and gender were reported.

#### Analyses

Bivariate analyses included chi-square and t-test conducted with SPSS (version 20.0). Confidence intervals were computed for proportions using Clopper-Pearson exact intervals with the NPTEST procedure. Confidence intervals that did not overlap were considered significant. Small sample size and inadequate power precluded multivariate modeling for all outcomes. We report a logistic regression for participants who smoked inside a Korean restaurant, but the relatively small number of participants limited the number of independent variables entered into the model.

#### Results

Most participants attended a Korean restaurant but not a Korean bar (n=1,974), 4 attended a Korean bar but not a Korean restaurant, and 195 attended both at least once during a typical month. Approximately 55% were female, mean age was 51.6 years (SD=16.9), 2.9% of females and 19.3% of males were current smokers, 94% were born in Korea, and had lived an average of 21.9 (SD=9.8) years

**Table 1. Reports of Ashtrays, no Smoking Signs, Smoking and Communication to smokers inside Korean Bars and Restaurants in California, 2007-2009<sup>a</sup>**

|   | Korean Restaurant |              | Korean Bar |              |
|---|-------------------|--------------|------------|--------------|
|   | N/%               | 95%CI        | N/%        | 95%CI        |
| Number of participants attended venue in typical month                          | 2,169             |              | 199        |              |
| Observed no-smoking sign  | 64.4%             | (61.3, 65.5) | 63.6%      | (55.4, 67.5) |
| Observed ashtrays   | 7.1%              | (6.1, 8.3)   | 45.0%      | (37.6, 50.0) |
| Participants who smoked inside  | 0.5%              | (0.4, 1.1)   | 23.6%      | (16.0, 26.0) |
| Observed others in group smoke inside   | 0.9%              | (0.6, 1.5)   | 51.5%      | (39.6, 51.9) |
| Observed others in venue smoke inside <sup>b</sup>                              | 7.5%              | (6.5, 8.8)   | 65.1%      | (56.1, 68.2) |
| Number of participants who observed smoking during a visit (in a typical month) | 169               |              | 141        |              |
| Percent who observed someone ask smoker to extinguish cigarette <sup>c</sup>    | 30.8%             | (24.3, 38.8) | 17.0%      | (11.2, 24.3) |
| By whom? <sup>d</sup>   |                   |              |            |              |
| Server/Manager  | 43.1%             | (29.3, 57.8) | 58.3%      | (36.6, 77.9) |
| Security Guard  | 2.0%              | (0, 10.4)    | 0%         | (0, 14.2)    |
| Patron (including study participant)  | 56.9%             | (42.2, 70.7) | 45.8%      | (25.6, 67.2) |
| Percent who observed someone gesture to smoker to extinguish cigarette          | 47.3%             | (42.0, 58.0) | 22.7%      | (16.6, 31.3) |
| By whom? <sup>d</sup>   |                   |              |            |              |
| Server/Manager  | 12.8%             | (6.3, 22.3)  | 10.0%      | (2.1, 26.5)  |
| Security Guard  | 1.3%              | (0, 6.9)     | 0%         | (0, 11.6)    |
| Patron (including study participant)  | 89.7%             | (80.8, 95.5) | 90.0%      | (73.5, 97.9) |

<sup>a</sup>Numbers are percentages or numbers of persons reporting activity for the full sample (n=2,173) of participants who attended either a Korean bar or Korean restaurant or both in a typical month. Confidence intervals were calculated for each proportion using Clopper-Pearson exact intervals.; <sup>b</sup>These numbers do not include the participant or others in their group.; <sup>c</sup>Denominator is number of participants who observed smoking during a visit in a typical month.; <sup>d</sup>Denominator is number of participants who observed smoking during a visit in a typical month AND observed someone ask or gestured smoker to extinguish cigarette.

**Table 2. Participant Smoked Inside Korean Bar Regressed on Demographics, Acculturation, other People Smoking Inside Bar and Participant's Smoking Status among Koreans in CA who attended a Korean bar, 2007-2009**

|                             | Model 1  |      |                   | Model 2  |      |                   | Model 3  |      |                    |
|-----------------------------|--|------|-------------------|--|------|-------------------|--|------|--------------------|
|                             | B  | SE   | OR 95% CI         | B  | SE   | OR 95% CI         | B  | SE   | OR 95% CI          |
| Age                         | *-0.05   | 0.01 | 0.95 (0.91, 0.98) | *-0.04   | 0.01 | 0.95 (0.92, 0.99) | 0.01   | 0.03 | 1.01 (0.94, 1.0)   |
| Gender                      | *-0.89   | 0.43 | 0.40 (0.17, 0.94) | -0.77  | 0.46 | 0.46 (0.18, 0.15) | 1.63   | 1.01 | 5.11 (0.69, 37.4)  |
| Acculturation               | -0.25  | 0.84 | 0.77 (0.14, 4.03) | -0.54  | 1.05 | 0.58 (0.07, 4.55) | 0.51   | 1.87 | 1.68 (0.04, 65.8)  |
| Other people smoking in bar |  |      |                   | *3.42  | 1.03 | 30.6 (4.0, 232)   | *5.31  | 1.24 | 203.1 (17.7, 2332) |
| Participant current smoker  |  |      |                   |  |      |                   | *5.75  | 0.99 | 314.3 (45.0, 2192) |
| Constant                    | *1.81  | 0.95 |                   | *-1.55   | 1.44 |                   | *-11.63  | 3.16 |                    |
| Model fit                   | Log likelihood=-101.49<br>R <sup>2</sup> =0.067, P=.002, N=195 |      |                   | Log likelihood = -83.8<br>R <sup>2</sup> =0.213, P<.001, N=195 |      |                   | Log likelihood=-35.6,<br>R <sup>2</sup> = 0.666\ P<.001, N=195 |      |                    |

\*aNotes: Each column represents a separate logistic regression model. Each subsequent model adds variables to the previous model. Numbers in cells represent beta coefficients, standard errors, odds ratios and 95% confidence intervals. Age is continuous. Gender is coded males = 1 and females = 2. Acculturation is a continuous scale where higher scores represent higher acculturation and lower scores represent stronger identification with traditional culture. Other people smoking in bar and participant current smoker are both dichotomous variables with no = 0 and yes = 1.; \*Denotes significant difference at two-tailed p<.05.

in the U.S. Males were significantly more likely to attend bars than women (14.7% vs. 4.6%,  $\chi^2=66.3$ ,  $df=1$ ,  $p<.001$ ); there was no gender difference in restaurant attendance. Compliance inside bars and restaurants. Refer to Table 1 for proportions, confidence intervals and sample sizes. Ashtrays were more often observed inside Korean bars (45%) than restaurants (7%). Approximately 64% of participants observed no-smoking signs inside both venues; there were no differences between bars or restaurants.

Smoking was observed more often inside a Korean bar than a Korean restaurant. Less than 1% of restaurant-going participants smoked inside a Korean restaurant while 7% observed someone else smoke inside. Over 23% of bar-going participants smoked inside a Korean bar and 65% observed someone else smoke inside a bar.

Participants in either bars or restaurants who observed ashtrays indoors were significantly more likely to smoke indoors or to observe others smoke indoors as compared to participants who did not observe ashtrays (Bar: Others smoked,  $\chi^2=28.5$ ,  $n=257$ ,  $df=1$ ,  $p<.001$ ; Participant smoked  $\chi^2=9.3$ ,  $n=263$ ,  $df=1$ ,  $p=.002$ ; Restaurant: Others smoked,  $\chi^2=148.6$ ,  $n=2,132$ ,  $df=1$ ,  $p<.001$ ; Participant smoked  $\chi^2=22.5$ ,  $n=263$ ,  $df=1$ ,  $p<.001$ ). However, observing a no-smoking sign was related to observing someone ask a smoker to extinguish his/her cigarette inside a Korean restaurant ( $\chi^2=5.5$ ,  $n=171$ ,  $df=1$ ,  $p=.02$ ), but not a bar ( $\chi^2=0.07$ ,  $n=137$ ,  $df=1$ ,  $p=.78$ ).

*Demographic and acculturation variables of smoking inside venue.*

Males were more likely to smoke inside bars than females but the proportions were not significantly different (26.2% vs 16.7%,  $\chi^2=1.9$ ,  $n=199$ ,  $df=1$ ,  $p=.16$ ). Less than 1% of both genders smoked inside restaurants. Participants who smoked inside bars or restaurants were more likely to be younger ( $M=32.6$ ,  $SD=10.7$ ) and more acculturated ( $M$  score=0.17,  $SD=.22$ ) than participants who did not smoke inside ( $M$  age=52.2,  $SD=16.7$ ,  $t(2,171)=14.3$ ,  $n=2,172$ ,  $p<.001$ ; acculturation  $M=-0.04$ ,  $SD=.30$ ,  $t(2,171)=-5.6$ ,  $n=2,172$ ,  $p<.001$ ).

*Smoking status and smoking inside venue.*

Current smokers were not more likely than non-

smokers to frequent bars and restaurants where smoking was observed inside. Approximately 57% of current smokers smoked inside a Korean bar and this was statistically higher than never (0%) and former smokers (3.9%) ( $\chi^2=78.5$ ,  $p<.001$ ). The presence of another smoker within the group or within the bar was associated with an increase likelihood of the participant smoking inside the bar. If someone else in their group smoked, 5.4% of former smokers admitted to smoking inside a Korean bar as compared to no former smokers smoking inside Korean bars where no one in their group smoked. We analyzed what percentage of the current smokers smoked in a bar when others in their group smoked. When no one else in the group smoked, none of the participants smoked ( $n=31$ ). However, if at least one other person in the group smoked, almost all of the participants smoked (44 out of 46  $\chi^2=69.2$ ,  $n=77$ ,  $df=1$ ,  $p<.001$ ). We observed a similar but attenuated effect if someone else in the bar smoked (not someone in their own social group). Approximately 4% ( $n=1/27$ ) of participants who were current smokers smoked in a bar where no one was smoking as compared with 86% ( $n=42/49$ ) of participants who smoked inside a bar where someone else in the bar smoked ( $\chi^2=47.6$ ,  $n=76$ ,  $df=1$ ,  $p<.001$ ).

*Multi-variate logistic regression.*

We conducted a logistic regression for participants who smoked inside a Korean bar (See Table 2). In the first model, we regressed participant smoked inside a bar on age, gender and acculturation where younger age and males were significantly more likely to smoke inside a bar. In the next model, we added the presence of others smokers in the bar which was significantly related to smoking in a bar. In the final model, we added current smoking status. Current smoking status plus observing others smoking in the bar significantly explained the variance in smoking inside a Korean bar. Once smoking status was added to the model, age and gender were no longer significant. In all models, acculturation was null once we controlled for other predictors. We could not include in our model the variable that someone else in the social group smoked because of cells with zeroes. When no one else in the group smoked, no participant smoked. Social cues observed by participants. Participants

who observed smoking inside bars (n=141) or inside restaurants (n=169) were asked if someone communicated opposition to smoking (See Table 1). Among participants who observed someone else smoke, a higher percentage of participants observed someone ask a smoker to stop smoking (31%) or gesture to a smoker (47%) inside Korean restaurants as compared to inside Korean bars (17% and 23%, respectively). Participants reported that patrons were more likely to gesture opposition to smoking than servers or managers, whereas participants reported equal percentages of patrons and staff voicing opposition.

#### *Social cues received by participant to stop smoking.*

Ten participants smoked inside restaurants and 47 inside bars. No participant who smoked inside a restaurant was told or reported a gesture to extinguish his/her cigarette. Among participants who smoked in bars, 5% observed a gesture and 12% were directly told to extinguish their cigarette [data not shown]. Participants who were told to extinguish a cigarette in a bar were less acculturated (M acculturation score=-0.041, SD=.21) than participants who were not told (M score=0.165, SD=.19,  $t(46)=2.6$ ,  $p=.01$ ). Age and gender of the participant were not related to receiving a cue (Age  $t(46)=-1.3$ ,  $p=.19$ ; Gender  $\chi^2=1.9$ ,  $n=48$ ,  $df=1$ ,  $p=.17$ ).

#### *Social cues given by participants.*

Thirty-two participants told or gestured to a smoker to stop smoking [data not shown]. More respondents communicated with smokers in restaurants (n=24) than bars (n=8) and more communicated with smokers who were other patrons (n=26) than smokers in their own group (n=6). Participants who communicated opposition to a smoker were younger (M=44.9, SD=13.4) than participants who did not (M=51.7, SD=16.9,  $t(32)=2.8$ ,  $p<.02$ ). In bars, participants who were less acculturated were also more likely to communicate opposition to smoking, but this relationship did not reach significance ( $t(8)=2.3$ ,  $p=.06$ ).

## Discussion

This study confirms the direct observation of high rates of smoking inside Korean bars in California (Antin et al., 2010; Lee et al., 2008). Over 65% of bar-going participants observed smoking inside a Korean bar in California, which is almost double that reported by the bar-going young adult population of all ethnicities in California (Al-Delaimy et al., 2009).

The environment and social contingencies differed between Korean bars and restaurants. Most participants who smoked inside a Korean bar did not smoke inside a Korean restaurant (47 participants smoked inside a bar but only 3 smoked inside a restaurant). Prior research with Korean American young adults showed that alcohol use provided a social context that increased exposure to cigarettes and allowed for experimentation (Myers et al., 2009). Participants reported more ashtrays inside Korean bars than restaurants; however, ashtrays were significantly related to smoking in both venues. Ashtrays may increase the urge to smoke and to discount the law and have

been reported before as predictors of non-compliance in bars (Moore et al., 2009; Thewissen et al., 2005). Social sanctions were more relaxed in Korean bars than restaurants. Participants observed almost twice as many gestures and verbal reprimands in restaurants than in bars.

Social cues may not convey the same message to smokers versus non-smokers or to acculturated versus traditional persons. Social cues may be more salient to smokers who intend to quit in the near future. Less acculturated participants were more likely to be told to extinguish their cigarette. Younger and more acculturated participants were more likely to smoke inside bars, although this difference did not remain in multi-variate models. More acculturated Koreans may be able to discriminate a social environment permissible to smoking versus one that is hostile. Smoking inside bars decreased with age, although age and smoking may not hold a linear relationship. Among Korean males, smoking increases with age up to age 35 and then declines with age (Allem et al., 2012).

These exploratory findings may reflect tobacco industry tactics, such as bar giveaways, to increase smoking among certain subgroups (Katz et al., 2002). Korean bars that permit smoking may expose patrons and staff to more secondhand smoke (Connolly et al., 2009; Nebot et al., 2009) and may encourage smoking because patrons may feel socially obligated to smoke (Kim et al., 2005). Implementation of smoke-free legislation has shown improvement in self-reported health outcomes among bar staff (Bannon et al., 2009; Hahn et al., 2007; Schoj et al., 2010)

Limitations. Data were collected through self-report, which allowed participants to provide informant accounts of behaviors and enforcement. True compliance can only be determined through direct observation and therefore we labeled our results as "indications" of compliance. Results are discussed as compliant or non-compliant based on self-report data which may not always be accurate. A recent analyses by Kang et al demonstrated that biochemically-verified smoking status was double the rate of self-reported smoking among Korean females in the Korean National Health and Nutrition Examination Survey (Kang et al., 2013). However, comparisons in the Netherlands reported that self-reported and observed work-place smoking bans was in agreement about three-quarters of the time and that false reporting because of social desirability was rare (Verdonk-Kleinjan et al., 2012). In addition, our small sample sizes limited the multi-variate analyses conducted. Our descriptive analyses set the stage for larger scale investigation of non-compliance in Korean hospitality venues.

Regarding future implications, Koreans do not believe public smoking will result in citations (Hofstetter et al., 2010); only one participant observed a security guard communicate with a smoker at a bar or restaurant. Social enforcement could be increased if the California statewide complaint system ensured access for persons who spoke Korean. Owners could be informed that the majority of Koreans do not smoke and that smoke-free environments may benefit bars financially by attracting new, nonsmoking clientele and by lowering the costs of cleaning (Johnson et

al. 2010). In fact, smoking bans have not shown detriment to revenue or to staff employment and may increase restaurant profitability (Alamar and Glantz, 2004; Klein et al., 2010; Stolzenberg and D'Alessio, 2007). Increased surveillance, enforcement and citations may reduce the amount of smoking and protect the health of smokers and non-smokers. Tobacco smoke is significantly related to higher lung cancer risk and moderately increased risk for other cancers among Asians. (Jee et al., 2004; Long et al., 2010; Park et al, 2008) Lung cancer is one of the more prevalent cancers among Korean men and women and has been strongly attributed to active smoking among Korean and Japanese men and women and moderately higher risk for SHS-exposure among Chinese women (Jee et al., 2004; Long et al., 2010).

Findings have implications for compliance not only in U.S. establishments but also for establishments in the Republic of Korea. Current smoking rates diverge by gender among Koreans in both countries. Approximately 47% of adult men and 7% of adult women in Korea (Katanoda et al., 2014) and 32% of Korean men and 4% of Korean women in California are active smokers (Allem et al., 2012). The inverse is that over half of Korean males and over 90% of Korean females are non-smokers. Non-smokers in Korea are more likely to be exposed to secondhand smoke in places other than their home and work which warrants a complete ban of smoking in public places (Hughes et al., 2008). Recent ordinances in parts of Korea restrict smoking in some government and public buildings, including restaurants. A study by Park et al, in 2013 revealed that second hand smoke exposure, as measured by particulate matter (PM2.5) and air nicotine concentrations, were highest in entertainment facilities as compared with government buildings and restaurants in Seoul, Korea. Air nicotine concentration was 22 times higher inside bars in Seoul than inside restaurants. Smoking was observed in locations where smoking was prohibited by law in Korea (Park et al, 2013) and this same observation of smoking in prohibited locations has been observed in other locales with recent smoke-free laws (Abidin et al., 2013; Moore et al., 2009).

Between 1995 and 2006, there was an approximate 24% relative risk reduction in smoking prevalence in the Republic of Korea with 70% of the decrease attributable to tobacco control efforts (Levy et al., 2010). Simulation models have shown that increase in cigarette taxes accounted for the largest reduction in smoking rates as compared to smoke-free laws which is contrary to results in the U.S where clean air laws and cigarette prices have equal effect (Dinno and Glantz, 2009; Levy et al., 2010;). The effect of smoke-free ordinances may be tempered in the Republic of Korea if compliance is low. Tobacco control may best be achieved by increasing and enforcing smoking restrictions (Hovell and Hughes, 2009). Failure to do so may enable both Korean and non-Korean subgroups to model smoking in public and weaken tobacco control efforts.

## Acknowledgements

We wish to thank all the participants in this longitudinal

health survey. Without them, this research would not have been possible. The project described was supported by the Grant Number [Masked for review] from the National Cancer Institute. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute or the National Institutes of Health. Intramural support was received from [Masked for review]. This study represents part of a dissertation for Dr. [Masked for review] in for a PhD in Public Health, Health Behavior from the joint program at [Masked for review]

## References

- Abidin EZ, Hashim Z, Semple S (2013). Second-hand smoke in public spaces: how effective has partial smoke-free legislation been in Malaysia? *Asian Pac J Cancer Prev*, **14**, 6845-50.
- Alamar BC, Glantz SA (2004). Smoke-free ordinances increase restaurant profit and value. *Contemp Econ Policy*, **22**, 520-5.
- Al-Delaimy WK, Edland S, Pierce JP, White MM (2009) Technical Report on Analytic Methods and Approaches Used in the 2008 California Tobacco Survey Analysis. Volume 2: Statistical Methodology, Public Use Data File Documentation, Individual Item Responses. La Jolla, CA: University of California, San Diego.
- Allem JP, Ayers JW, Unger JB, et al (2012). Smoking trajectories among Koreans in Seoul and California: Exemplifying a common error in age parameterization. *Asian Pac J Cancer Prev*, **13**, 1851-6
- An N, Cochran SD, Mays VM, McCarthy WJ (2008). Influence of American acculturation on cigarette smoking behaviors among Asian American subpopulations in California. *Nicotine Tobacco Research*, **10**, 579-87.
- Antin TMJ, Moore RS, Lee JP, Satterlund TD (2010). Law in practice: obstacles to a smoke free workplace policy in bars serving Asian patrons. *J Immigrant Minority Health*, **12**, 221-7.
- Bannon F, Devlin A, McElwee G, Gavin A (2009). Greater gains from smoke-free legislation for non-smoking bar staff in Belfast. *Eur J Public Health*, **19**, 638-43.
- Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey Questionnaire (or Examination Protocol, or Laboratory Protocol). Hyattsville, MD: U.S. Department of Health and Human Services, Centers Disease Control Prev, 2007-2008. Accessed October 7, 2014 from [http://www.cdc.gov/nchs/nhanes/nhanes2007-2008/questexam07\\_08.htm](http://www.cdc.gov/nchs/nhanes/nhanes2007-2008/questexam07_08.htm)
- Connolly GN, Carpenter CM, Travers MJ, et al (2009). How smoke-free laws improve air quality: a global study of Irish pubs. *Nicotine Tobacco Res*, **11**, 600-5.
- Dinno A, Glantz S (2009). Tobacco control policies are egalitarian: A vulnerabilities perspective on clean indoor air laws, cigarette prices, and tobacco use disparities. *Social Science Med*, **68**, 1439-47.
- Hahn EJ, Rayens MK, York N, et al (2006). Effects of a smoke-free law on hair nicotine and respiratory symptoms of restaurant and bar workers. *J Occup Environ Med*, **48**, 906-13.
- Hofstetter CR, Hovell MF, Lee J, et al. (2004). Tobacco use and acculturation among Californians of Korean descent: A behavioral epidemiological analysis. *Nicotine Tobacco Res*, **6**, 481-9.
- Hofstetter CR, Ayers JW, Irvin VL, et al (2009). Does church participation facilitate tobacco control? A report on Korean

- immigrants. *J Immigrant Minority Health*, **12**, 187-97.
- Hofstetter CR, Hovell MF, Irvin VL, et al (2010). It's Others, Not the Police: Smoking, reprimand, and fines among adults of Korean descent in California. *Health Psychology*, **29**, 255-61.
- Hovell MF, Hughes SC (2009). The behavioral ecology of secondhand smoke exposure: A pathway to complete tobacco control. *Nic Tob Res*, **11**, 1254-64.
- Hughes SC, Corcos IA, Hofstetter CR, et al (2008). Secondhand smoke exposure among nonsmoking adults in Seoul, Korea. *Asian Pac J Cancer Prev*, **9**, 247-52.
- Hughes SC, Corcos IA, Hofstetter CR, Hovell MF, Irvin VL (2009). Longitudinal study of household smoking ban adoption among Korean Americans. *Am J Prev Med*, **37**, 437-40.
- Hughes SC, Usita PM, Hovell MF, Hofstetter CR (2011). Reactions to secondhand smoke by nonsmokers of Korean descent: Clash of culture? *J Immigrant Minority Health*, **13**, 766-71.
- Huh J, Sami M, Abramova ZS, Spruijt-Metz D, Pentz MA (2013). Cigarettes, culture and Korean American emerging adults: An exploratory qualitative study. *West J Nurs Res* **35**, 1205-21
- Jee SH, Samet JM, Ohr H, Kim JH, Kim IS (2004). Smoking and cancer risk in Korean men and women. *Cancer Causes Control*, **15**, 341-8.
- Johnson HH, Becker C, Inman L, Webb K, Brady C (2010). Why be smoke-free? A qualitative study of smoker-free restaurant owner and manager opinions. *Health Promotion Practice*, **11**, 89-94.
- Kang HG, Kwon KH, Lee IW, et al (2013). Biochemically-verified smoking rate trends and factors associated with inaccurate self-reporting of smoking habits in Korean women. *Asian Pac J Cancer Prev*, **14**, 6807-12.
- Katz SK, Lavack AM (2002). Tobacco related bar promotions: insights from tobacco industry documents. *Tobacco Control*, **11**, 92-101.
- Katanoda K, Jiang Y, Park S, et al (2014). Tobacco control challenges in East Asia: proposals for change in the world's largest epidemic region. *Tob Control*, **23**, 359-68.
- Kim SS, Son H, Nam KA (2005). The sociocultural context of Korean American men's smoking behavior. *Western J Nursing Res*, **27**, 604-23.
- Klein EG, Forster JL, Collins NM, Erickson DJ, Toomey TL (2010). Employment change for bars and restaurants following a statewide clean indoor air policy. *Am J Prev Med*, **39**, 16-22.
- Lazuras L, Zlatev M, Rodafinos A, Eiser JR (2012). Smokers' compliance with smoke-free policies and non-smokers' assertiveness for smoke-free air in the workplace: a study from the Balkans. *Int J Pub Health*, **57**, 769-75.
- Lee JP, Antin TMJ, Moore RS (2008). Social organization in bars: Implications for tobacco control policy. *Contemporary Drug Problems*, **35**, 59-98.
- Levy DT, Cho SI, Kim YM, et al (2010). SimSmoke model evaluation of the effect of tobacco control policies in Korea: the unknown success story. *AJPH*, **100**, 1267-73.
- Long N, Moore MA, Chen W, et al. (2010). Cancer epidemiology and control in north-East Asia-past, present and future. *Asian Pac J Cancer Prev*, **11**, 107-48.
- Moore RS, Lee JP, Martin SE, Todd M, Chu BC (2009). Correlates of persistent smoking in bars subject to smokefree workplace policy. *Int J Environ Res Public Health*, **6**, 1341-57.
- Myers MG, Doran NM, Trinidad DR, Wall TL, Klonoff EA (2009). A prospective study of cigarette smoking initiation during college: Chinese and Korean American students. *Health Psychol*, **28**, 448-56.
- Nebot M, Lopez MJ, Ariza C, et al (2009). Impact of the Spanish smoking law on exposure to secondhand smoke in offices and hospitality venues: before-and-after study. *Environmental Health Perspectives*, **117**, 344-7.
- Park S, Bae J, Nam BH, Yoo KY (2008). Aetiology of cancer in Asia. *Asian Pac J Cancer Prev*, **9**, 371-80.
- Park EY, Lim KM, Yang W, et al (2013). Policy effects of secondhand smoke exposure in public places in the Republic of Korea: Evidence from PM2.5 levels and air nicotine concentrations. *Asian Pac J Cancer Prev*, **14**, 7725-30.
- Satterlund TD, Lee JP, Moore RS, Antin TM (2009). Challenges to implementing and enforcing California's smoke-free workplace act in bars. *Drugs: Educat Prevent Policy*, **16**, 422-35.
- Schoj V, Alderete M, Ruiz E, et al (2010). The impact of a 100% smoke-free law on the health of hospitality workers from the city of Neuquén, Argentina. *Tobacco Control*, **19**, 134-7.
- Stolzenberg L, D'Alessio SJ (2007). Is nonsmoking dangerous to the health of restaurants? The effect of the California's indoor smoking an on restaurant revenues. *Eval Rev*, **31**, 75-92.
- Suinn RM, Ahuna C, Khoo G (1992). The Suinn-Lew Asian Self-Identity Acculturation Scale: Concurrent and factorial validation. *Educational Psychological Measurement*, **52**, 1041-6.
- Tang H, Cowling DW, Lloyd JC, et al (2003). Changes of Attitudes and Patronage Behaviors in Response to a Smoke-Free Bar Law. *Am J Public Health*, **93**, 611-7.
- Thewissen R, van den Hout M, Havermans RC, Jansen A (2005). Context-dependency of cue-elicited urge to smoker. *Addiction*, **100**, 387-96.
- Tong EK, Tang H, Tsoh J, Wong C, Chen MS Jr (2009). Smoke-free policies among Asian-American women: comparisons by education status. *Am J Prev Med*, **37**, 144-50.
- Verdonk-Kleinjan WM, Rijswijk PC, Candel MJ, et al (2012). Agreement between self-reports and on-site inspections of compliance with a workplace smoking ban. *Nic Tob Res*, **14**, 1121-5.