

The Impact of a Smoke-Free Ordinance on the Health and Attitudes of Bartenders

Karen A. Palmersheim, PhD, MS^a, Patrick L. Remington, MD, MPH^b,

David F. Gundersen, MPH^c

Abstract

Introduction: This report presents the findings from a longitudinal study of bartenders in Madison and Appleton, designed to assess change in their health and attitudes after the implementation of a smoke-free workplace ordinance in July 2005.

Methods: Surveys conducted before and after the ordinance was implemented collected information on the number of hours exposed to secondhand smoke, prevalence of upper respiratory tract symptoms, attitudes towards smoking in bars and restaurants, and perceptions of risk related to secondhand smoke exposure. Spirometric assessments were conducted on a subset of the survey participants to measure forced vital capacity (FVC), forced expiratory volume in 1 second (FEV₁), and forced expiratory flow, midexpiratory phase (FEF_{25%-75%}).

Results: Exposure to secondhand smoke during an average week decreased from 22 hours to 3 hours in the workplace and from 8 hours to about 3 1/2 hours in other places. Among non-smokers, the prevalence of all eight upper respiratory symptoms decreased significantly (wheezing or whistling in chest, shortness of breath, cough first thing in the morning, cough during the rest of the day and night, cough up any phlegm, red or irritated eyes, runny nose, nose irritation, or sneezing, and sore or scratchy throat). Support for not allowing smoking in bars that are also restaurants increased significantly for all respondents; with Madison bartenders reporting a significant increase in support, but not Appleton bartenders. Support for totally smoke-free bar/taverns decreased slightly though this change was not statistically significant. Perceived level of health risk associated with exposure to secondhand smoke did not change

^a Dr. Palmersheim is an epidemiologist and director of the Tobacco Surveillance and Evaluation Program, University of Wisconsin Comprehensive Cancer Center.

^b Dr. Remington is Associate Director of Cancer Control and Outreach, University of Wisconsin Comprehensive Cancer Center.

^c Mr. Gundersen is Tobacco Treatment and Addiction Coordinator with the Wisconsin Tobacco Prevention and Control Program, Department of Health and Family Services.

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significantly. A significant increase in mean absolute change in FVC was observed among non-smokers who had not experienced cold or flu prior to the study.

Conclusion: This study demonstrates a significant reduction in upper respiratory symptoms among non-smoking bartenders following the establishment of a smoke-free workplace ordinance in two Wisconsin cities. These results suggest that this policy will help reduce the future risk of disease related to secondhand smoke among employees and patrons of bars in Madison and Appleton.

Introduction

Exposure to secondhand smoke is associated with an increased risk for lung cancer and coronary heart disease in non-smoking adults.^{1,2,3} Young children exposed to secondhand smoke are at increased risk of sudden infant death syndrome (SIDS), asthma, bronchitis, and pneumonia.^{1,4} Other conditions that have been found to be associated with secondhand smoke include chronic coughing, phlegm, wheezing, chest discomfort, eye and nose irritation.^{1,3,5,6}

Individuals are differentially exposed to secondhand smoke, depending upon their home and work environments. For example, Wortley et al. analyzed data on a nationally representative sample of the non-institutionalized population from the Third National Health and Nutrition Examination Survey (NHANES III) (1988 to 1994).⁷ The analysis was restricted to 4,952 employed nonsmoking adults who reported no home exposure to cigarette smoke. They found mean serum cotinine levels were highest for those working in the restaurant and hospitality industry (i.e., wait staff, bartenders). These findings suggest that individuals employed in these types of occupations would be at an increased risk of developing conditions associated with secondhand smoke, and accordingly, would benefit most from the elimination of such exposure.

The purpose of this study was to assess change in the health and attitudes of bartenders relative to decreased exposure to secondhand smoke in the workplace, after the establishment of a smoke-free workplace ordinance.

Methods

The baseline and follow-up surveys were conducted by the University of Wisconsin Survey Center, under the direction of the University of Wisconsin Tobacco Surveillance and Evaluation Program and the Wisconsin Tobacco Prevention and Control Program. Baseline data were collected during the 2 months prior to the ordinance, which went into effect July 1, 2005. A detailed report discussing the methods and results of the baseline study can be found at <http://www.medsch/mep/>. The follow-up survey was conducted 3-5 months after the establishment of the ordinance.

Study Population: The sampling frame for the baseline survey included all individuals licensed to sell alcoholic beverages in Madison (n=2,405) and Appleton (n = 847). The questionnaire included a statement that instructed only recipients who were tending bar at that time to complete

the survey. Others were instructed to indicate that they were no longer working as a bartender and return the questionnaire in the postage-paid envelope provided without completing the remaining questions.

Using the number of licensees with valid addresses as a denominator, the final adjusted response rate for the baseline survey was 60% in Madison and 56% in Appleton. The sampling frame for the follow-up survey included all individuals that participated in the baseline survey who were working as bartenders in the cities of Madison (n=693) and Appleton (n=177). The response rate for the follow-up survey was 71% for Madison and 75% for Appleton.

Data Collection: Information was collected using a 4-page, self-administered mail questionnaire that assessed the number of hours exposed to secondhand smoke while at home, at work, and in other places, the prevalence of eight upper respiratory tract symptoms, attitudes towards smoking in bars and restaurants, and perceptions of the health risk associated with secondhand smoke exposure.

Pulmonary Function Tests: A subset of the survey participants also participated in a study designed to assess ventilatory function. Using a portable spirometer, certified pulmonary function technologists conducted assessments of forced vital capacity (FVC), forced expiratory volume in 1 second (FEV₁), and forced expiratory flow, midexpiratory phase (FEF_{25%-75%}). Adhering to American Thoracic Society Guidelines, each subject performed 5 forced expiratory maneuvers. Three of the maneuvers had to be within 5% reproducibility in order to qualify as an acceptable pulmonary function test (PFT). The majority of assessments were conducted in a controlled environment, allowing for consistent air temperature and quality at baseline and follow-up. In a few cases, the pulmonary function technologist conducted the tests in the subject's home.

Analytical Samples: In order to be included in the current analysis, subjects had to be bartending within the city limits of either Appleton or Madison at both baseline and follow-up. In addition, they had to be working in an establishment that allowed smoking during the baseline survey, and that was smoke-free during the follow-up phase. There were 405 participants meeting these criteria. Further, bartender smoking status needed to be known in order to control for this factor in analyses. Two respondents did not report their smoking status. Therefore, the final sample was 403. Paired t-tests were employed to compare baseline scores to follow-up scores on measures of upper respiratory symptoms, attitudes towards smoking in bars, and level of perceived risk associated with exposure to secondhand smoke.

All analyses were conducted with the Appleton and Madison survey respondents combined in one data set, and then repeated for each group of respondents separately. The findings presented in the body of this report are those from the combined analysis. Tables and figures displaying the data and outcomes for the separate analyses can be found in the form of appendices at the end of this report (Appendix A: Appleton, Appendix B: Madison).

In order to be included in the spirometry analysis, subjects had to meet the same criteria as outlined above. In addition, the participant had to complete the mail survey (from the larger survey study) at both baseline and follow-up, and had to perform at least 3 acceptable

(reproducible within 5%) maneuvers at both baseline and follow-up. There were 73 participants meeting these criteria. The best maneuver was selected by an expert over-reader for both baseline and follow-up. Paired t-tests were employed to compare baseline assessments to those obtained at follow-up on the absolute values for FVC, FEV₁, and FEF_{25%-75%}. In addition, an average of the “within subject” percent change for each measurement was calculated across all subjects.

Results

Survey: Sample characteristics of bartenders who participated in both the baseline and follow-up studies are presented in Table 1. The final sample ranged from 19 to 75 years of age (mean = 37, median = 34), was 54% female, 97 % White, and 1% Hispanic. About 2% of the participants had less than a high school education, 19% had a high school diploma or GED, 38% had completed some college while 11% had an associate’s degree, 24% had a bachelor’s degree, and 6% had obtained a professional or graduate level of education. The number of months working at the “current bar” ranged from 2 to 468, (mean = 75, median = 48), and bartenders reported working from 2 to 70 hours per week (mean = 24, median = 22). Forty-three percent of the sample were current smokers, with level of consumption ranging from 1 to 70 cigarettes per day (mean = 14, median = 13).

Table 2 displays the ranges and mean estimates of exposure to secondhand smoke in the home, at work, and other places, during baseline and at follow-up. Exposure was self-reported as the number of hours exposed during the past 7 days. Outliers were truncated at the sample 99th percentile (those subjects that reported an extra-ordinarily high number of hours were assigned the value at which 99% of the sample fell at or below). Exposure to secondhand smoke in the home ranged from 0 to 60 hours at both baseline and follow-up. Mean exposure was 3.4 hours at baseline and 3.2 hours at follow-up. Exposure to secondhand smoke at work ranged from 0 to 60 hours at baseline, and from 0 to 56 hours at follow-up. Mean exposure at work decreased from 22.1 hours at baseline to 2.8 hours during follow-up. Exposure to smoke in other places ranged from 0 to 50 during both time periods. Similar to workplace exposure, mean exposure in other places decreased from 7.9 hours at baseline to 3.6 hours during the follow-up phase. The last column displays the p-value for the t-test analyses. The observed decrease in exposure was statistically significant at both work and in other places.

Respondents were also asked to report how often they experienced a number of upper respiratory symptoms over the past 4 weeks. Data were dichotomized (collapsed into yes/no categories) for the current analyses. In order to control for the effects of smoking status, the sample was stratified by bartender smoking status at follow-up. Table 3 presents the findings for those participants who reported being non-smokers. A statistically significant decrease was observed for all eight upper respiratory symptoms. For example, an absolute percent change of 10% was revealed for ‘wheezing or whistling in chest’ (31% to 21%; p=.001) and ‘cough first thing in the morning’ (43% to 33%; p=.014). For ‘sore or scratchy throat’, an absolute percent change of 23% was noted (61% to 38%; p=.000).

Table 4 presents the prevalence of upper respiratory symptoms at baseline and follow-up for those participants who reported being current smokers. Fewer bartenders experienced seven of the eight symptoms at follow-up, compared to baseline. This decrease was statistically significant for one symptom, 'red or irritated eyes'. Sixty percent of the participants reported experiencing this symptom at baseline compared to 50% at follow-up ($p=.037$). A decrease in the symptom 'cough up any phlegm' was close to significance (59% to 51%; $p=.080$).

Respondents were asked whether they thought smoking should be allowed in bars that are also restaurants (restaurant/bars), and in bars that are not restaurants (bars/taverns). Overall, there was a statistically significant increase in support for smoke-free restaurant/bars from baseline to follow-up (50% to 55%; $p=.017$) (see Table 5). The sample was further stratified by smoking status in analyzing these data. Non-smokers were generally more supportive of smoke-free restaurant/bars at both baseline and follow-up. However, a significant increase in support was observed among smokers, but not among non-smokers (35% to 42%; $p=.042$ vs. 61% to 66%; $p=.166$, respectively). To investigate potential regional differences in attitudes, the sample was stratified by city. Madison bartenders expressed stronger support, and a significantly greater increase in support, for smoke-free restaurant/bars compared to Appleton bartenders (53% to 59%; $p=.016$ vs. 40% to 42%; $p=.620$, respectively).

A parallel question examined whether participants thought smoking should be allowed in bars that are not restaurants (bars/taverns). Table 6 displays the percentage of bartenders that felt smoking should not be allowed in bars/taverns at baseline and follow-up, respectively. Overall, there was a slight decrease in support for smoke-free bars/taverns from baseline to follow-up, though this change was not statistically significant (28% to 25%; $p=.132$). While non-smokers were considerably more supportive of smoke-free bars/taverns than smokers, a decrease in support was observed among both smokers and non-smokers (8% to 7%; $p=.529$ and 43% to 39%; $p=.171$). As with restaurant/bars, Madison bartenders expressed stronger support in general for smoke-free bars/taverns, but a slight decrease in support was noted among both Madison and Appleton bartenders (31% to 30%; $p=.318$ vs. 15% to 11%; $p=.158$).

Finally, respondents indicated on a scale from 1 to 5, how great of a health risk they think secondhand smoke presents, with "1" representing "no risk at all" and "5" indicating "extremely serious risk" (Table 7). In general, there was very little change in bartenders' perceptions of the health risk associated with exposure to secondhand smoke. Overall perceived risk was 3.3 at baseline, and 3.2 at follow-up ($p=.233$). While non-smokers were more likely to think secondhand smoke is harmful than smokers at both baseline and follow-up, the scores for each group did not change significantly (3.6 to 3.6; $p=.838$, and 2.8 to 2.7; $p=.112$, respectively). Regional differences also remained consistent pre- to post-ordinance, with Madison bartenders perceiving secondhand smoke as a greater health risk than Appleton bartenders. Yet, neither group expressed a significant change in this perception (3.4 to 3.3; $p=.121$, and 2.9 to 3.0; $p=.630$, respectively).

Spirometry: The spirometry sample ranged from 19 to 69 years of age (mean = 37, median = 34), was 43% female, 90% White, and 3% Hispanic. About 1% of the participants had less than a high school education, 14% had a high school diploma or GED, 34% had completed some college while 11% had an associate's degree, 33% had a bachelor's degree, and 7% had obtained

a professional or graduate level of education. The number of months working at the “current bar” ranged from 3 to 336, (mean = 64, median = 43), and bartenders reported working from 2 to 70 hours per week (mean = 22, median = 20). Thirty-four percent of the sample were current smokers, with level of consumption ranging from 2 to 40 cigarettes per day (mean = 15, median = 15).

Among non-smokers (n=44), the mean absolute values for FVC (measured in liters), FEV₁ (measured in liters/second), and FEF_{25%-75%} (measured in liters/second) increased from baseline to follow-up. However, the observed changes were not statistically significant. The averaged “within subject” percent changes were 1.00% for FVC, 1.18% for FEV₁, and 3.59% for FEF_{25%-75%}.

For smokers (n=29), the mean absolute values for FVC and FEV₁ decreased, and FEF_{25%-75%} increased slightly, though none of the changes were significant. The averaged percent changes were all less than 1%.

In order to control for the effect of cold and flu, in addition to that associated with smoking, analyses were conducted on a subsample of non-smokers that reported not having a cold or the flu within 4 weeks of the baseline or follow-up study (n=26). For these subjects, an increase was observed for all three measurements, though only the mean absolute change in FVC was statistically significant. The averaged “within subject” percent changes were 1.19% for FVC, 0.96% for FEV₁, and 2.15% for FEF_{25%-75%}.

Discussion

This study demonstrates that establishment of a smoke-free workplace ordinance was associated with a significant reduction in secondhand smoke exposure among bartenders at work. The workplace ordinance was also associated with significant reductions in exposure in other places. This suggests that when bartenders are not at work, they may be spending some of their time in establishments that have also become smoke-free.

In addition, analyses suggest that the reduced level of exposure to secondhand smoke corresponded with a reduction in the prevalence of upper respiratory symptoms among these workers. In particular, among non-smokers, the prevalence of eight upper respiratory symptoms was significantly lower after the establishment of the smoke-free workplace ordinance compared to that observed prior to the ordinance. Though the change in symptoms was not as great among smokers, even this group reported a significant (and near significant) reduction in the prevalence of two of the eight symptoms.

These findings are similar to those reported by Eisner et al.⁶ in a study of bartenders in San Francisco. However, due to a small sample in the Eisner study, the results could not be broken down by individual symptoms, and the health impacts were grouped when the sample was stratified and analyzed by smoking status. The current study had ample power by which to analyze each symptom independently, in addition to stratifying the sample by smoking status.

Overall, there was limited change in ventilatory function. However, a statistically significant increase was observed in mean absolute change in FVC among non-smokers who had not experienced a cold or flu prior to the study. These findings may reflect a limited utility for spirometry to detect changes in otherwise healthy subjects (not presenting with serious chronic respiratory conditions). Eisner et al.⁶ observed slightly greater change in pulmonary function; yet, their findings were also limited. This study was conducted in a controlled environment with conditioned air. Bartenders in the Eisner study were tested in the bars at which they worked. Accordingly, the air quality in those establishments could have changed dramatically from pre- to post-ordinance. Their findings could reflect, in part, an acute change in function relative to air quality differences pre- to post.

The study revealed an overall increase in support for smoke-free bars if they are also restaurants. This change in opinion was more notable among smokers (35% to 42%); though, non-smokers were still more likely to condone such legislation in general (66%). Regional variations continue, with Madison bartenders reporting greater support for smoke-free bar/restaurants compared to Appleton bartenders, and, exhibiting a significant increase in this support since the establishment of the ordinance. In contrast, support for smoke-free bar/taverns decreased slightly, though the change was not significant. As with smoke-free bar/restaurants, non-smokers and bartenders in Madison reported stronger support for smoke-free bar/taverns than their counterparts. These findings may be reflective of the political climate and media coverage which has surrounded the issue in the respective cities, as well as differences in general attitudes towards these types of legislation. Moreover, these findings are consistent with those found in previous surveys (2003 Wisconsin Tobacco Survey⁸) and national public opinion polls⁹, that have revealed stronger support, and a slightly more rapid growth in support, for smoke-free restaurants, compared to bar/taverns.

Perceptions of the health risk associated with exposure to secondhand smoke did not change. As found at baseline, non-smokers perceived it as a greater risk than smokers. Madison bartenders perceived it as a greater risk than those working in Appleton. The lack of a change in perceived risk, given the apparent change in upper respiratory symptoms pre- to post-ordinance, may seem incongruent. However, on the individual level, many of the participants may not recognize their change in symptoms over the time period assessed. In addition, level of risk is generally assessed in relative terms, based on one's current knowledge and preconceived notions. In other words, an individual may not assess the health risk associated with exposure to secondhand smoke as high as the risk associated with direct cigarette smoking. Thus, while most people would likely rank direct cigarette smoking at the upper end of the risk scale, they may rank exposure to secondhand smoke somewhere below that. Yet, a majority of the bartenders surveyed did perceive exposure to secondhand smoke as presenting a moderate or greater level of risk to their health at both baseline and follow-up.

Limitations

It is difficult to know how potential differences between this sample and the entire population of bartenders in the two cities may limit the generalizability of these findings to all bartenders in Appleton and Madison. In addition, the current analytical approach did not control for

sociodemographic factors, or other factors that may affect upper respiratory symptoms (i.e., asthma or chronic obstructive pulmonary disease). Analyses revealed that 13% of the bartenders reported having asthma and 3% reported having chronic obstructive pulmonary disease. Future analyses can control for these factors.

The study did not assess the prevalence of allergies in the sample; however, findings based on data from the third National Health and Nutrition Examination Survey show that 54.3% of individuals aged 6-59 years old had a positive skin test response to at least one of the 10 allergens tested¹⁰. Given the high prevalence of allergies in the general population, it is likely that a comparable prevalence would be randomly distributed throughout the study population.

An additional limitation to the present study is the use of a self-administered questionnaire. A number of studies demonstrate a modest correlation between self-reported levels of secondhand smoke exposure and biomarkers (i.e., serum cotinine).^{11,12,13} However, it is difficult to exclude potential misclassification of exposure. Bartenders experiencing respiratory symptoms may be more likely to report secondhand smoke exposure, whereas those without symptoms may underreport exposure. There may be differential reporting depending upon whether the bartender agrees with the smoking ban ordinance.

Conclusions

This study demonstrates a significant reduction in upper respiratory symptoms among non-smoking bartenders following the establishment of a smoke-free workplace ordinance in two Wisconsin cities—a result associated with a significant reduction in exposure to secondhand smoke. These results suggest that this policy will help reduce the future risk of disease related to secondhand smoke among employees and patrons of bars in Madison and Appleton.

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Table 1. Characteristics of Follow-Up Sample (N=403)

Age (years)	
Range	19-75
Mean	37
Median	34
Gender (%)	
Female	54
Race/Ethnicity (%)	
White	97
Other	5
Hispanic	1
Education (%)	
Less than high school	2
High school diploma/ GED	19
Some college (no degree yet)	38
Associate's degree	11
Bachelor's degree	24
Graduate or professional degree	6
Months bartending at current bar (#)	
Range	2-468
Mean	75
Median	48
Hours work in current bar (# per week)	
Range	2-70
Mean	24
Median	22
Current Smoker (%)	
43	
Cigarettes smoked per day (#)	
Range	1-70
Mean	14
Median	13

Table 2. Level of Exposure to Secondhand Smoke at Home, Work, and Other Places at Baseline and Follow-up, and Results of Paired T-Test Analyses*

Place of Exposure	Baseline (# of hours/past 7 days)	Follow-up (# of hours/past 7 days)	p-value*
Home			
Range	0 - 60	0 - 60	
Mean	3.4	3.2	.717
Work			
Range	0 - 60	0 - 56	
Mean	22.1	2.8	.000
Other			
Range	0 - 50	0 - 50	
Mean	7.9	3.6	.000

* 2-tailed test

Table 3. Percent Reporting Upper Respiratory Symptoms at Baseline and Follow-up and Results of Paired T-Test Analyses* (Non-Smokers; N=230)

Upper Respiratory Symptoms (past 4 weeks)	Percent Reporting Symptom		Paired t-tests
	Baseline	Follow-up	p-value
Wheezing or whistling in chest	31%	21%	.001
Shortness of breath	41%	30%	.001
Cough first thing in the morning	43%	33%	.014
Cough during the rest of the day/night	52%	32%	.000
Cough up any phlegm	53%	34%	.000
Red or irritated eyes	70%	48%	.000
Runny nose/irritation, sneezing	78%	57%	.000
Sore or scratchy throat	61%	38%	.000

* 2-tailed test

Table 4. Percent Reporting Upper Respiratory Symptoms at Baseline and Follow-up and Results of Paired T-Test Analyses* (Smokers; N=173)

Upper Respiratory Symptoms (past 4 weeks)	Percent Reporting Symptom		Paired t-tests
	Baseline	Follow-up	p-value
Wheezing or whistling in chest	40%	38%	.649
Shortness of breath	44%	47%	.485
Cough first thing in the morning	57%	55%	.601
Cough during the rest of the day/night	56%	54%	.670
Cough up any phlegm *	59%	51%	.080
Red or irritated eyes *	60%	50%	.037
Runny nose/irritation, sneezing	61%	60%	.778
Sore or scratchy throat	54%	47%	.146

* 2-tailed test

Table 5. Bartenders’ Opinions on Whether Smoking Should Be Allowed in Restaurant/Bars, at Baseline and Follow-up and Results of Paired T-Test Analyses*

	Baseline (% “No”)	Follow-up (% “No”)	p-value
All Respondents	50	55	.017
Smokers	35	42	.042
Non-Smokers	61	66	.166
Madison	53	59	.016
Appleton	40	42	.620

*** 2-tailed test**

Table 6. Bartenders' Opinions on Whether Smoking Should Be Allowed in Bars/Taverns, at Baseline and Follow-up and Results of Paired T-Test Analyses*

	Baseline (% "No")	Follow-up (% "No")	p-value
All Respondents	28	25	.132
Smokers	8	7	.529
Non-Smokers	43	39	.171
Madison	31	30	.318
Appleton	15	11	.158

* 2-tailed test

Table 7. Bartenders' Perceived Health Risk of Exposure to Secondhand Smoke, at Baseline and Follow-up and Results of Paired T-Test Analyses*

Question: Perceived health risk of secondhand smoke (1 = no risk, 5 = extremely serious risk)

	Baseline (mean)	Follow-up (mean)	p-value
All Respondents	3.3	3.2	.233
Smokers	2.8	2.7	.112
Non-Smokers	3.6	3.6	.838
Madison	3.4	3.3	.121
Appleton	2.9	3.0	.630

* 2-tailed test

Appendix A: Appleton Bartender Survey Results

Table 1a. Characteristics of Follow-Up Sample (Appleton; N=92)

Age (years)	
Range	20-75
Mean	38
Median	35
Gender (%)	
Female	74
Race/Ethnicity (%)	
White	98
Other	2
Hispanic	0
Education (%)	
Less than high school	3
High school diploma/ GED	24
Some college (no degree yet)	39
Associate's degree	16
Bachelor's degree	11
Graduate or professional degree	7
Months bartending at current bar (#)	
Range	4-257
Mean	66
Median	47
Hours work in current bar (# per week)	
Range	3-50
Mean	20
Median	20
Current Smoker (%)	
58	
Cigarettes smoked per day (#)	
Range	1-70
Mean	14
Median	13

Appendix A: Appleton Bartender Survey Results

Table 2a. Level of Exposure to Secondhand Smoke at Home, Work, and Other Places at Baseline and Follow-up, and Results of Paired T-Test Analyses* (Appleton; N=92)

Place of Exposure	Baseline (# of hours /past 7 days)	Follow-up (# of hours /past 7 days)	p-value*
Home			
Range	0-60	0-60	
Mean	5.8	4.1	.193
Work			
Range	0-60	0-42	
Mean	20.1	3.0	.000
Other			
Range	0-50	0-28	
Mean	8.8	4.2	.000

* 2-tailed test

Appendix A: Appleton Bartender Survey Results

Table 3a. Percent Reporting Upper Respiratory Symptoms at Baseline and Follow-up and Results of Paired T-Test Analyses* (Appleton; Smokers; N=53)

Upper Respiratory Symptoms (past 4 weeks)	Percent Reporting Symptom		Paired t-tests
	Baseline	Follow-up	p-value
Wheezing or whistling in chest	25%	26%	.742
Shortness of breath	28%	42%	.090
Cough first thing in the morning	51%	55%	.674
Cough during the rest of the day/night	52%	56%	.569
Cough up any phlegm *	57%	51%	.444
Red or irritated eyes *	60%	38%	.006
Runny nose/irritation, sneezing	53%	51%	.799
Sore or scratchy throat	45%	43%	.830

* 2-tailed test

Appendix A: Appleton Bartender Survey Results

Table 4a. Percent Reporting Upper Respiratory Symptoms at Baseline and Follow-up and Results of Paired T-Test Analyses* (Appleton; Non-Smokers; N=39)

Upper Respiratory Symptoms (past 4 weeks)	Percent Reporting Symptom		Paired t-tests
	Baseline	Follow-up	p-value
Wheezing or whistling in chest	13%	10%	.771
Shortness of breath	23%	23%	1.000
Cough first thing in the morning	37%	29%	.373
Cough during the rest of the day/night	46%	27%	.051
Cough up any phlegm	54%	31%	.018
Red or irritated eyes	62%	36%	.023
Runny nose/irritation, sneezing	72%	49%	.027
Sore or scratchy throat	56%	33%	.027

* 2-tailed test

Appendix A: Appleton Bartender Survey Results

Table 5a. Bartenders' Opinions on Whether Smoking Should Be Allowed in Restaurant/Bars, at Baseline and Follow-up and Results of Paired T-Test Analyses* (Appleton; N=92)

	Baseline (% "No")	Follow-up (% "No")	p-value
All Respondents	40	42	.620
Smokers	31	38	.044
Non-Smokers	53	47	.571

* 2-tailed test

Appendix A: Appleton Bartender Survey Results

Table 6a. Bartenders' Opinions on Whether Smoking Should Be Allowed in Bars/Taverns, at Baseline and Follow-up and Results of Paired T-Test Analyses* (Appleton; N=92)

	Baseline (% "No")	Follow-up (% "No")	p-value
All Respondents	15	11	.158
Smokers	2	4	.569
Non-Smokers	33	21	.023

* 2-tailed test

Appendix A: Appleton Bartender Survey Results

Table 7a. Bartenders' Perceived Health Risk of Exposure to Secondhand Smoke, at Baseline and Follow-up and Results of Paired T-Test Analyses* (Appleton; N=92)

Question: Perceived health risk of secondhand smoke (1 = no risk, 5 = extremely serious risk)

	Baseline (mean)	Follow-up (mean)	p-value
All Respondents	2.9	3.0	.630
Smokers	2.7	2.7	.875
Non-Smokers	3.3	3.4	.584

*** 2-tailed test**

Appendix B: Madison Bartender Survey Results

Table 1b. Characteristics of Follow-Up Sample (Madison; N=311)

Age (years)	
Range	19-75
Mean	36
Median	34
Gender (%)	
Female	47
Race/Ethnicity (%)	
White	96
Other	4
Hispanic	2
Education (%)	
Less than high school	2
High school diploma/ GED	18
Some college (no degree yet)	38
Associate's degree	9
Bachelor's degree	28
Graduate or professional degree	6
Months bartending at current bar (#)	
Range	2-468
Mean	79
Median	49
Hours work in current bar (# per week)	
Range	2-70
Mean	25
Median	25
Current Smoker (%)	
39	
Cigarettes smoked per day (#)	
Range	1-40
Mean	14
Median	13

Appendix B: Madison Bartender Survey Results

Table 2b. Level of Exposure to Secondhand Smoke at Home, Work, and Other Places at Baseline and Follow-up, and Results of Paired T-Test Analyses* (Madison; N=311)

Place of Exposure	Baseline (# of hours /past 7 days)	Follow-up (# of hours /past 7 days)	p-value*
Home			
Range	0-60	0-60	
Mean	2.6	2.9	.679
Work			
Range	0-60	0-56	
Mean	22.7	2.8	.000
Other			
Range	0-50	0-50	
Mean	7.7	3.4	.000

* 2-tailed test

Appendix B: Madison Bartender Survey Results

Table 3b. Percent Reporting Upper Respiratory Symptoms at Baseline and Follow-up and Results of Paired T-Test Analyses* (Madison; Smokers; N=120)

Upper Respiratory Symptoms (past 4 weeks)	Percent Reporting Symptom		Paired t-tests
	Baseline	Follow-up	p-value
Wheezing or whistling in chest	47%	43%	.495
Shortness of breath	51%	50%	.733
Cough first thing in the morning	60%	55%	.319
Cough during the rest of the day/night	57%	53%	.413
Cough up any phlegm *	60%	51%	.114
Red or irritated eyes *	59%	55%	.468
Runny nose/irritation, sneezing	65%	64%	.867
Sore or scratchy throat	58%	49%	.096

* 2-tailed test

Appendix B: Madison Bartender Survey Results

Table 4b. Percent Reporting Upper Respiratory Symptoms at Baseline and Follow-up and Results of Paired T-Test Analyses* (Madison; Non-Smokers; N=191)

Upper Respiratory Symptoms (past 4 weeks)	Percent Reporting Symptom		Paired t-tests
	Baseline	Follow-up	p-value
Wheezing or whistling in chest	34%	23%	.000
Shortness of breath	44%	31%	.000
Cough first thing in the morning	44%	34%	.022
Cough during the rest of the day/night	53%	33%	.000
Cough up any phlegm	53%	35%	.000
Red or irritated eyes	72%	50%	.000
Runny nose/irritation, sneezing	80%	58%	.000
Sore or scratchy throat	61%	39%	.000

* 2-tailed test

Appendix B: Madison Bartender Survey Results

Table 5b. Bartenders' Opinions on Whether Smoking Should Be Allowed in Restaurant/Bars, at Baseline and Follow-up and Results of Paired T-Test Analyses* (Madison; N=311)

	Baseline (% "No")	Follow-up (% "No")	p-value
All Respondents	53	59	.016
Smokers	36	44	.140
Non-Smokers	63	69	.058

* 2-tailed test

Appendix B: Madison Bartender Survey Results

Table 6b. Bartenders' Opinions on Whether Smoking Should Be Allowed in Bars/Taverns, at Baseline and Follow-up and Results of Paired T-Test Analyses* (Madison; N=311)

	Baseline (% "No")	Follow-up (% "No")	p-value
All Respondents	31	30	.318
Smokers	11	8	.259
Non-Smokers	44	43	.579

* 2-tailed test

Appendix B: Madison Bartender Survey Results

Table 7b. Bartenders' Perceived Health Risk of Exposure to Secondhand Smoke, at Baseline and Follow-up and Results of Paired T-Test Analyses* (Madison; N=311)

Question: Perceived health risk of secondhand smoke (1 = no risk, 5 = extremely serious risk)

	Baseline (mean)	Follow-up (mean)	p-value
All Respondents	3.4	3.3	.121
Smokers	2.9	2.8	.054
Non-Smokers	3.7	3.6	.659

*** 2-tailed test**