

# Assessing secondhand tobacco smoke (SHS) exposure among persons with severe and persistent mental illness (SPMI) accessing community mental health services

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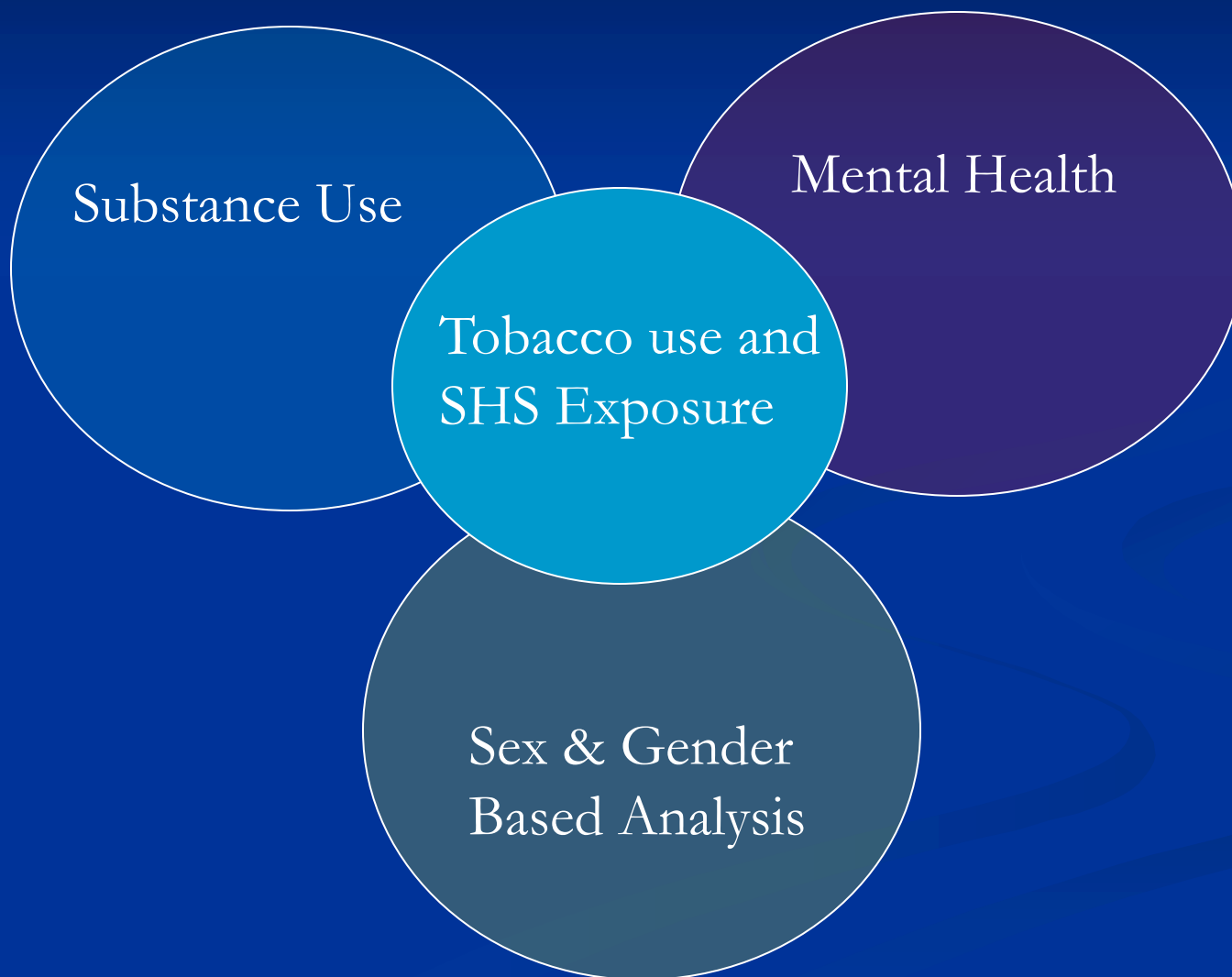
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# Overview

- Research progress to date
- Background and significance
- Study findings and implications
- Current and future investigations

# Research Progress to date



# Background and Significance

## Top 3 Smoking-Attributable Causes of Death in Canada

### #1 Lung cancer

### #2 Ischemic heart disease

### #3 Chronic airways obstruction<sup>1</sup>



#### Cancers<sup>1</sup>

Bronchus	Lung,
Esophagus	Lip, Oral cavity/pharynx
Cervix uteri	Larynx, trachea
Stomach <sup>2</sup>	Urinary bladder
Leukemia <sup>2</sup>	Colon <sup>2</sup>
Kidney,	Pancreas
other urinary	Liver <sup>2</sup>

#### Cardiovascular disease<sup>1</sup>

Ischemic heart disease  
Cerebrovascular disease  
Rheumatic heart disease  
Atherosclerosis  
Hypertension  
Aortic aneurysm  
Pulmonary heart disease  
Other arterial disease

#### Respiratory disease<sup>1</sup>

Chronic airways obstruction  
Asthma  
Bronchitis/emphysema  
Pneumonia/influenza  
Respiratory tuberculosis

#### Paediatric disease<sup>1</sup>

Low birth weight  
Respiratory conditions-newborn  
Respiratory distress syndrome  
Sudden Infant Death Syndrome

#### Reproductive Problems<sup>2</sup>

Reduced fertility  
Spontaneous Abortion  
Placental abruption

1. Makomaski Illing EM, Kaiserman, MJ. *Can J Public Health* 2004;95:38-44.

2. Ghadirian, P (for Health Canada). *Sleeping with a Killer: The Effects of Smoking on Human Health*. Health Canada. Sept. 2002.



# Smoking Prevalence in Canada: 18%

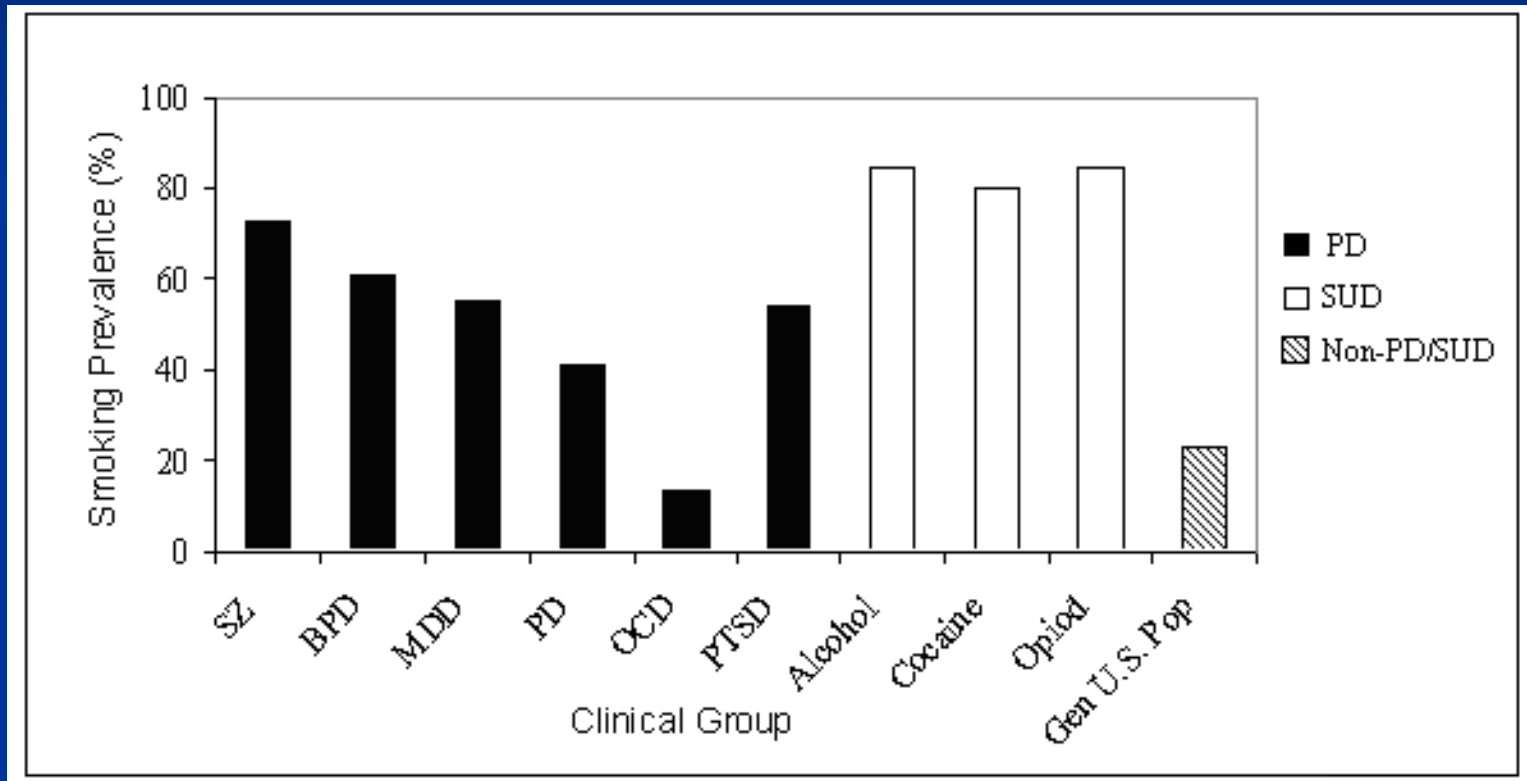
## Almost 5 Million Smokers



# Why individuals with SPMI?

- Significantly higher mortality rates and reduced life expectancy (Dembling, Chen & Bachon, 1999; Piatt, Munetz, Ritter, 2010)
- Increased deaths from suicide, heart disease, cancer incidence (Miller, Paschall & Svendsen, 2008)
- High co-occurrence of psychological and biological vulnerability for mental illness and tobacco use (Kalman, Morissette, & George, 2005)
- The culture of tobacco use in psychiatric settings (Lawn, 2005; Reilly, Murphy & Alderton, 2006)

# Prevalence of tobacco use among individuals with SPMI



Kalman, Morissette and George (2005), *Am. J. Addict.*, 14: 106-123

# Why Secondhand Tobacco Smoke (SHS) Exposure?

- Estimated 1000 deaths per year in Canada
- Associated with cardiovascular disease, lung and other cancers, and respiratory illness



**It's a scientific fact –  
he's fuming inside**

After just minutes of exposure to secondhand smoke, his *immune* system is weakened, blood thickens and his heart beats faster. Magnify that by a day, a week, a year, and he may as well be smoking, himself.

You want your teenagers to start working, not smoking. Call your elected officials and demand smokefree air!

Sponsored by **Citizens for a Healthy Workplace.**  
Everybody deserves smokefree air.

Client: Multnomah County Health  
Agency: Curtis & Jeidy, Portland, OR

# Animal studies

- Antinociceptive effects of SHS exposure (Anderson KL, Pinkerton KE, Uyeminami D, et al. 2004; Mousa SA, Aloyo VJ, Van Loon GR. 1988; Simons CT, Cuellar JM, Moore JA, et al., 2005)
- Nicotine dependence from SHS exposure (Yamada et al, 2010; Small et al, 2010; Harris, et al 2010)



# Epidemiological studies

- SHS exposure in childhood associated with
  - Reporting positive symptoms of initial smoking experience
  - Nicotine dependence symptoms
  - Smoking initiation



(Okoli et al, 2007; Belanger et al, 2008; Becklake et al, 2005)

# SHS and cognitive impairments

- *“Exposure to secondhand smoke and cognitive impairment in non-smokers: national cross sectional study with cotinine measurement.”*

Llewellyn, D. J., Lang, I. A., Langa, K. M., Naughton, F., & Matthews, F. E. (2009). *British Medical Journal*, 338(feb12\_2), b462-.

The screenshot shows the MedPage Today website interface. At the top, there is a navigation bar with links: HOME, MY MEDPAGE, NEW TOP TEN, CME/CE TRACKER, ABOUT US, and RSS. Below this is the MedPage Today logo. A search bar is present with the text 'NEW Search beta:' and a 'Go' button. A horizontal menu lists various categories: MEETING COVERAGE, NEWS BY SPECIALTY, BLOGS, COLUMNS, WASHINGTON WATCH, and STATE REQUIRED. Below the menu, there is a list of medical topics: Medical News, Primary Care, Alternative Medicine, Back Pain, Dental Health, Diabetes, Diet, Eating Disorders, Exercise & Fitness, Flu & URI, Geriatrics, Obesity, Preventive Care, Swine Flu, Vaccines, Meeting Coverage, and AGS. A section titled 'Smoking & Tobacco' is highlighted. Below this, the breadcrumb trail reads: HOME > NEWS BY SPECIALTY > PRIMARY CARE > SMOKING & TOBACCO. The main content area features a 'CME Information' section with logos for the University of Pennsylvania School of Medicine and the Office of CME and MedPage Today. It lists credits: Physicians: 0.25 AMA PRA Category 1 Credit(s). The release date is Feb. 16, 2009, and the expiration date is Feb. 16, 2010. The estimated time for completion is 15 minutes. There is a note that there is no fee for this activity. A 'To Receive Credit' section explains that users should read the information about this activity, including the disclosure statements, review the entire activity, take the post-test, and complete the evaluation form. A 'From Our Archive' section states that continuing education credit for this activity has expired. A login prompt encourages users to log in or create a free account for complete access. The article title 'Secondhand Smoke Linked to Adult Cognitive Impairment' is prominently displayed, with a link to download a complimentary source PDF. The article is by John Gever, Senior Editor, MedPage Today, published on February 16, 2009, and reviewed by Robert J. Jasmer, MD, Associate Clinical Professor of Medicine, University of California, San Francisco. The article text begins with 'CAMBRIDGE, England, Feb. 16 -- Passive smoking can damage the brain of those 50 and older, researchers here said.' An 'Action Points' section lists a point: 'Explain to interested patients that passive smoking, also known as secondhand smoke, is a risk factor for heart disease, lung disorders, and other ailments.'



# SHS and Depression

- **“Secondhand Smoke Exposure and Depressive Symptoms.”** Bandiera, F. C., Arheart, K. L., Caban-Martinez, A. J., Fleming, L. E., McCollister, K., Dietz, N. A., et al. (2010). *Psychosom Med*, 72(1), 68-72.

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## Secondhand smoke may double likelihood of depression

Updated 10/2/2009 9:09 PM | Comments 259 | Recommend 38 | E-mail | Save | Print | Reprints & Permissions |

By Marilyn Elias, USA TODAY



Enlarge

By Carolyn Kaster, AP

Cigarette butts in an ashtray at a diner. Secondhand smoke has been found to raise the risk for heart disease, lung cancer, dementia and now depression.

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### SMOKING DROPS

Whether secondhand smoke was verified by the blood, those exposed to smoke were far more likely to have symptoms of serious depression, says study leader Frank Bandiera, a public health researcher at the University of Miami School of Medicine. Even working where smoking was allowed in public places more than doubled the risk of depression, he says.

There's strong evidence that smokers have higher rates of depression than non-smokers, but studies conflict on whether the smoking came first or vice versa, Bandiera says. Animal and human studies do show that smokers have more dopamine in their brains, which he says has been tied to anxiety and depression. So secondhand smoke might have the same effect on non-smokers.

Secondhand smoke also has been found to raise the risk for heart disease and lung cancer. Another new study not reported at the meeting found that inhaling other people's cigarette smoke could increase the risk of memory problems and dementia after age 50, say researchers at the University of Cambridge. Their research was published last month in the *British Medical Journal*.

### QUIT SMOKING

Pregnancy can motivate smokers to kick habit



It takes a village to quit -- or realization you could buy a new car instead



Approach it like training for marathon

On the Web: American Cancer Society guide | SmokeFree.gov | BecomeAnEx.org

### BETTER LIFE: Secondhand smoke may increase risk of cognitive impairment 44%

About 4 out of 10 U.S. adults are covered by state or local laws against smoking in bars, restaurants and workplaces, 7 out of 10 are protected in at least one of these arenas, says Patrick Reynolds, president of the Foundation for a Smokefree America, an advocacy group.

Concern about health effects is accelerating, he adds. "There's been a tidal wave of state laws against smoking in bars and restaurants just in the last six years." Twenty-four states don't allow such smoking; 22 have passed their laws since 2003, he says.

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# SHS and Psychological distress

## ■ "Objectively Assessed Secondhand Smoke Exposure and Mental Health in Adults - Cross- sectional and Prospective Evidence From the Scottish Health Survey"

Mark Hamer, PhD; Emmanuel  
Stamatakis, PhD; G. David Batty,  
PhD  
*Arch Gen Psychiatry.*  
2010;67(8):(doi:10.1001/archgenps  
ychiatry.2010.76).

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### Secondhand Smoke Associated With Psychiatric Distress, Illness

ScienceDaily (June 8, 2010) — Exposure to secondhand smoke appears to be associated with psychological distress and the risk of future psychiatric hospitalization among healthy adults, according to a report posted online that will appear in the August print issue of *Archives of General Psychiatry*.

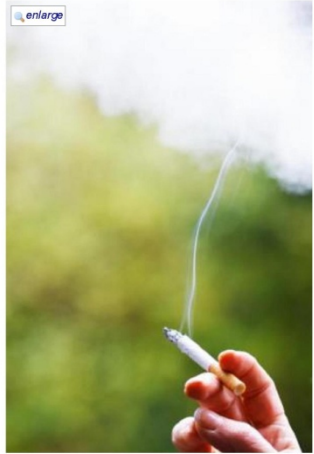
**See Also:**

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  - Bronchitis
  - Nicotine

"A growing body of literature has demonstrated the harmful physical health effects of secondhand smoke exposure," the authors write as background information in the article. "Given the highly prevalent exposure to secondhand smoke — in the United States, an estimated 60 percent of American non-smokers had biological evidence of exposure to secondhand smoke — even a low level of risk may have a major public health impact."

Mark Hamer, Ph.D., of University College London, and colleagues studied 5,560 non-smoking adults (average age 49.8) and 2,595 smokers (average age 44.8) who did not have a history of mental illness and participated in the Scottish Health Survey in 1998 or 2003. Participants were assessed with a questionnaire about psychological distress, and admissions to psychiatric hospitals were tracked over six years of follow-up. Exposure to secondhand smoke among non-smokers was assessed using saliva levels of cotinine — the main product formed when nicotine is broken down by the body — "a reliable and valid circulating biochemical marker of nicotine exposure," the authors write.

A total of 14.5 percent of the participants reported psychological distress. Non-smokers with a high exposure to secondhand smoke (cotinine levels between 0.70 and 15 micrograms per liter) had higher odds of psychological distress when compared with those who had no detectable



Second hand smoke exposure is associated with psychological distress and risk of future psychiatric illness (Credit: iStockphoto/Michael Bodmann)

#### Related Stories

**Secondhand Smoke Exposure Associated With Chronic Sinus Disease** (Apr. 20, 2010) — Individuals who are exposed to more secondhand smoke in private and public settings appear more likely to have chronic rhinosinusitis, according to a new ... [read more](#)

## Specific Aims

- a) Describe the frequency, sources, and feelings towards SHS exposure among individuals with SPMI accessing community mental health services
- b) Assess factors (i.e., gender, demographics, living situation, primary diagnosis, and substance use history) associated with SHS exposure among smokers and nonsmokers with SPMI accessing community mental health services.

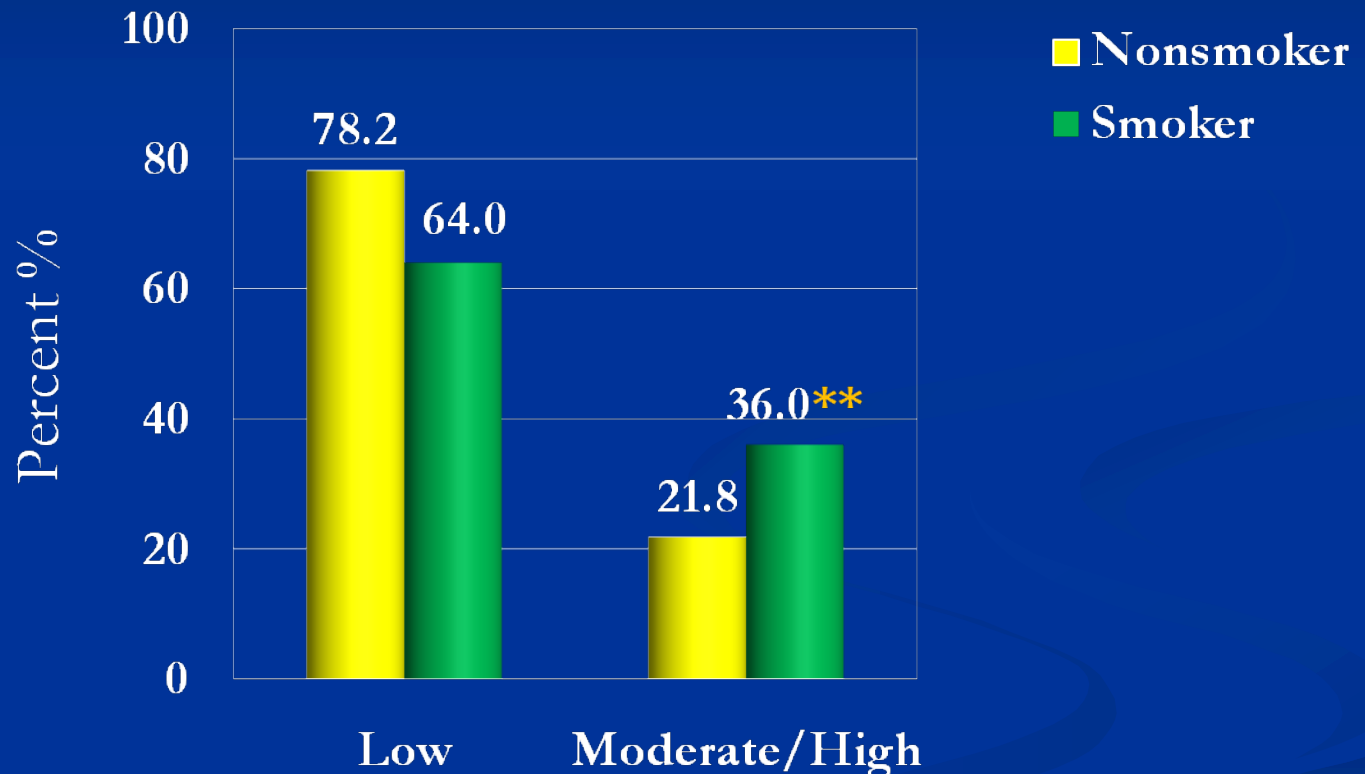
# Sample Characteristics

- A survey questionnaire administered to a convenience sample of individuals receiving mental health services from 9 Community Mental Health Centres in Vancouver, BC (N = 788).

- 51.5% female
- 47.2% smokers
- 62.6% single & never married
- 53% > high school education
- 53.1% live alone
- Primary diagnosis:
  - Schizophrenia: 46.4%
  - Schizoaffective disorder: 14.4%
  - Mood: 38.1%
  - Anxiety: 2.1%
- Mean age: 48. 7 (SD = 12.1) years
- Mean sources of SHS exposure: 2.9 (SD = 1.8) sources

# Figure 1. Perceived frequency of SHS exposure\* by smoking status

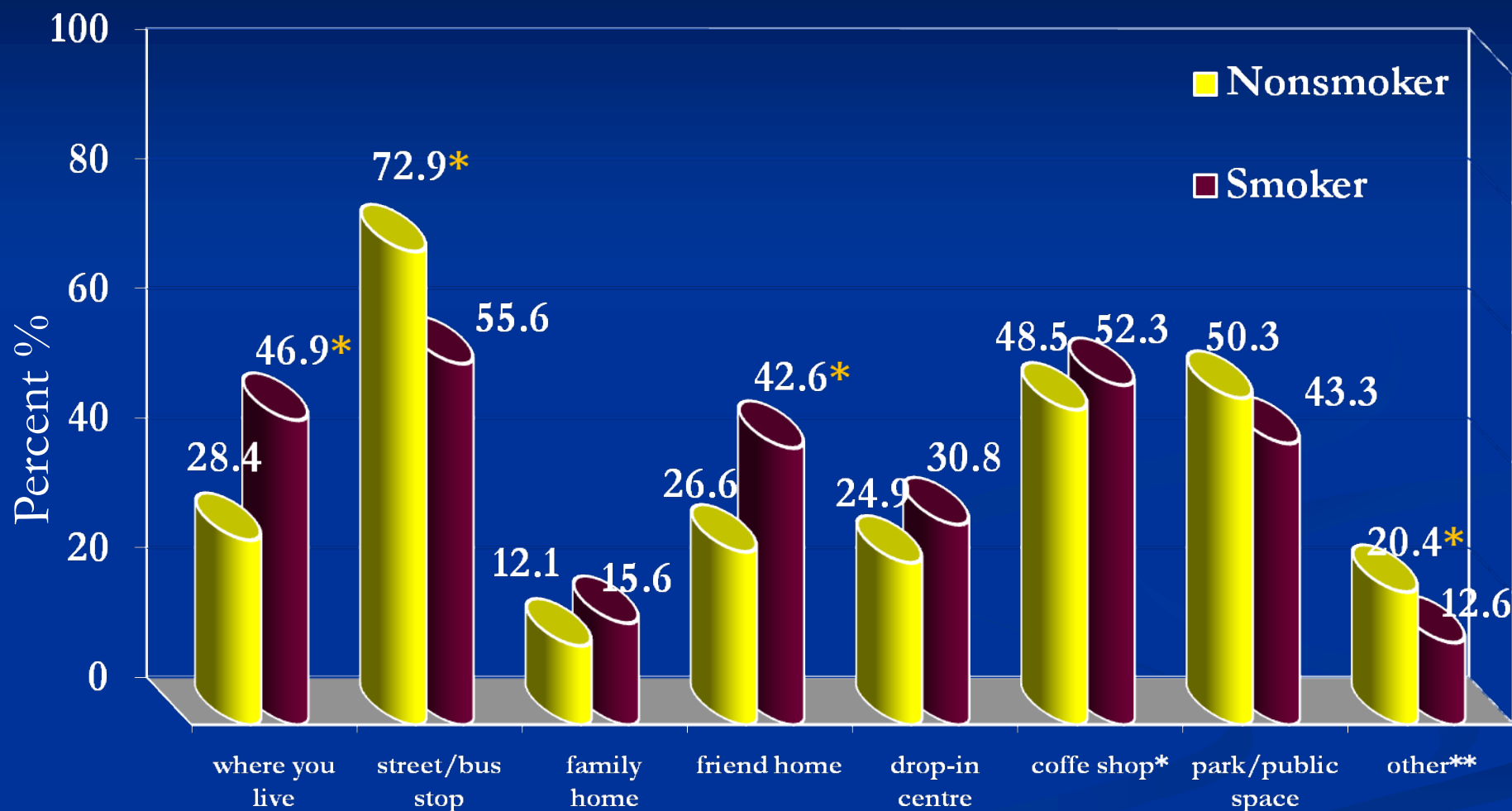
“How often are you exposed to secondhand smoke (other people’s smoke)?”



Note. \* The perceived frequency of exposure measure has been dichotomized by collapsing response choices to the question, “How often are you exposed to secondhand smoke (other people’s smoke)?” into two categories. Individuals who responded “not at all” or “sometimes” were categorized as ‘Low exposure’ and individuals responding ‘frequently’ or “all the time” were categorized as ‘Moderate/High exposure’

\*\*p <.0001 (based on chi-square analyses)

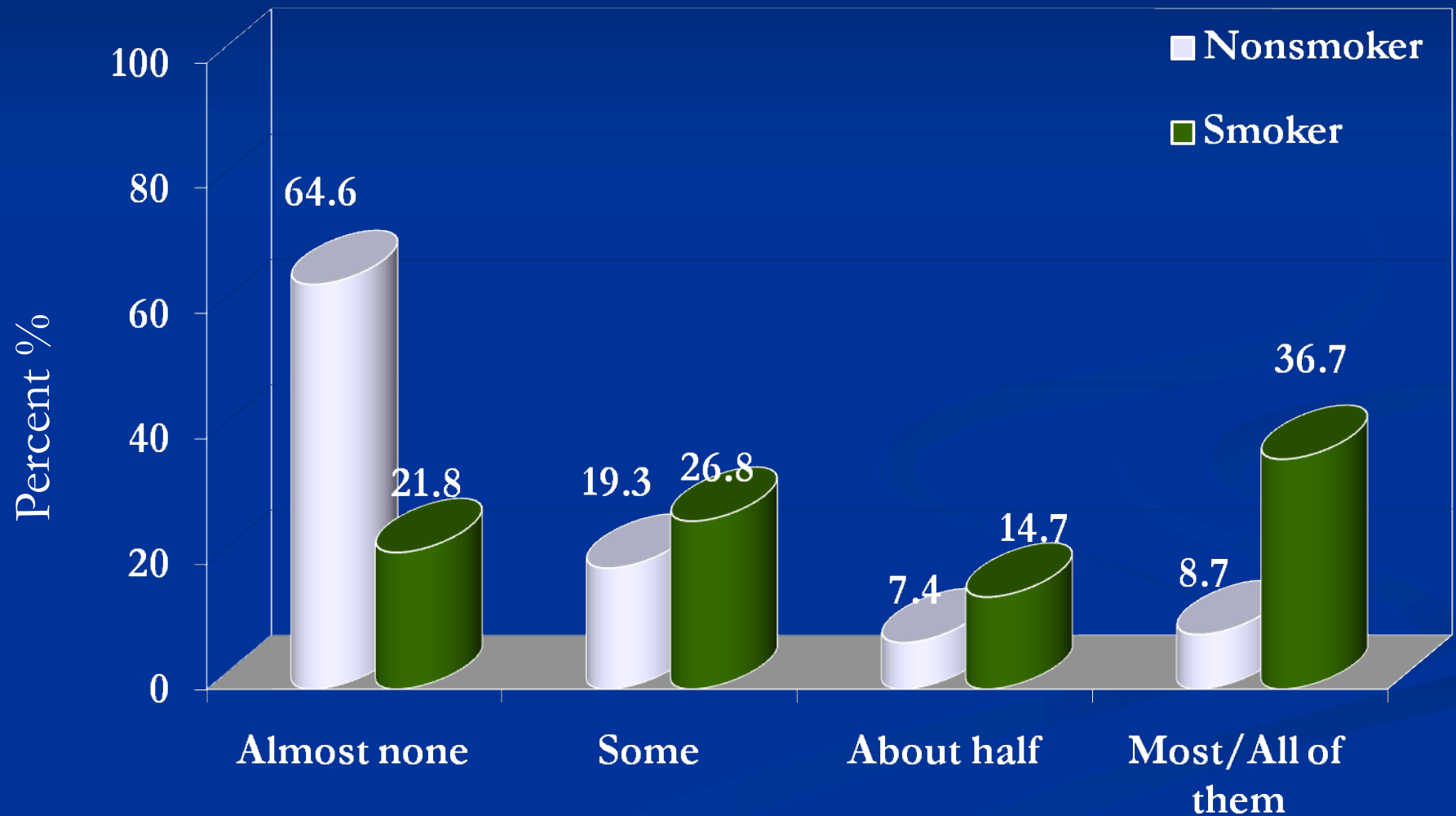
# Figure 2. Sources of SHS exposure by smoking status



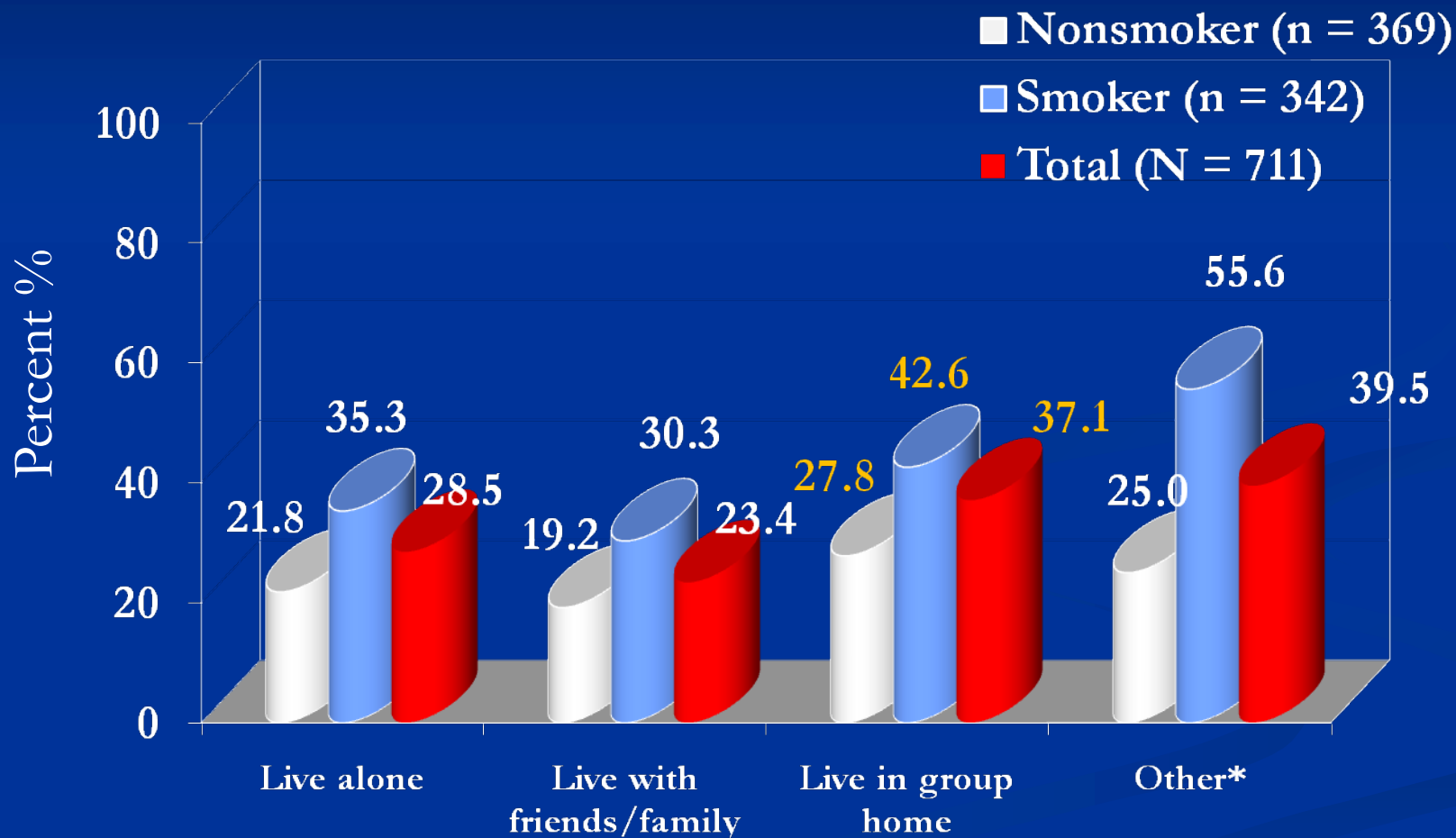
Note. \*Of those reporting exposure in a coffee shop, bar, or restaurant, 5.3% of respondents were exposed *inside* the venue, 78.3% were exposed *outside* the venue, and 16.3% reported exposure both inside and outside the venue.

\*\* other includes exposure in the car, work, or school; \* $p \leq .001$  (based on chi-square analyses)

**Figure 3. Acquaintances who smoke by smoking status**



**Fig 4. Perceived frequency of moderate/high SHS exposure by living situation and smoking status**



\*other includes homeless, YMCA/Shelter; \* $p \leq .001$  (based on chi-square analyses)

**Table 1. Correlates of perceived frequency of exposure (moderate/high vs low) total sample (N = 704)**

	<i>Odds Ratio</i>	<i>95% CI</i>
<b>Primary diagnosis</b>		
Schizophrenia	.30*	.09-.99
Schizoaffective disorder	.38	.11-1.37
Mood disorder	.33	.10-1.11
Anxiety disorder (referent)	1.0	
<b>Acquaintances who smoke</b>		
Almost none (referent)	1.0	
Some	2.21*	1.33-3.69
About half	3.72*	2.01-6.90
Most/All of them	5.96*	3.47-10.23
<b>Number of sources of SHS exposure</b>	1.34*	1.20-1.49

\* $p \leq .05$  (based on a two-step model building procedure. In the first step, univariate logistic regression analyses were used to determine the unadjusted association between the perceived frequency of SHS exposure (low exposure vs moderate/high exposure) and demographic, smoking status, primary diagnosis, substance use, SHS exposure (i.e., number of sources of SHS exposure), and the number of acquaintances who smoke. In the second step, only variables that were associated with the perceived frequency of SHS exposure ( $\alpha = .10$ ) were included in the final multivariate model. Only significant correlates from the second step are shown)



**Table 2. Correlates of perceived frequency of exposure (moderate/high vs low) stratified by smoking status**

	<i>Nonsmoker</i>		<i>Smoker</i>	
	<i>Odds Ratio</i>	<i>95% CI</i>	<i>Odds Ratio</i>	<i>95% CI</i>
<b>Gender</b>				
Female	--	--	1.72*	1.05-2.89
Male (referent)			1.0	
<b>Acquaintances who smoke</b>				
Almost none (referent)	1.0		1.0	
Some	2.27*	1.16-4.47	2.28	.97-5.37
About half	1.74	.61-4.99	5.45*	2.18-13.63
Most/All of them	5.58*	2.29-13.57	6.66*	2.95-15.03
<b>Number of sources of SHS exposure</b>	1.52*	1.25-1.83	1.28*	1.12-1.46

\* $p \leq .05$  (based on a two-step model building procedure. In the first step, univariate logistic regression analyses were used to determine the unadjusted association between the perceived frequency of SHS exposure (low exposure vs moderate/high exposure) and demographic, smoking status, primary diagnosis, substance use, SHS exposure (i.e., number of sources of SHS exposure), and the number of acquaintances who smoke. In the second step, only variables that were associated with the perceived frequency of SHS exposure ( $\alpha = .10$ ) were included in the final multivariate model. Only significant correlates from the second step are shown)

# Summary of Key Findings & Implications

- Individuals with SPMI who smoke have higher perceived SHS exposure than nonsmokers
- Primary sources of exposure- street and bus stops followed by parks/outdoor public places
- Greater perceived exposure among nonsmokers living in group home settings
- Perceived exposure is associated with diagnosis, acquaintances who smoke, female gender (among smokers only), and number of sources of exposure

# Current and Future Investigations

- Smoking on the Margins: An Equity Analysis of the Outcomes of an Outdoor Smoke-free Policy
- Examining exposure to SHS among individuals with SPMI accessing community mental health services
- Implementing smoke-free group homes for individuals with Mental illness

# Beautiful British Columbia!

