

Deadly Fumes

British Columbia Workplace Death Toll attributable to Secondhand Smoke 1989 to 1998

A report prepared by:

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Introduction

This report, *Deadly Fumes*, contains an estimate of workplace deaths attributable to secondhand smoke in the Province of British Columbia, Canada. The estimate covers the 10 year period, 1989 to 1998, to correspond with the Workers' Compensation Board of BC's report entitled *Lost Lives*:

<http://www.worksafebc.com/priority/lostlives/lostlives.asp>

which examines workplace death for the same 10 year period. While the WCB has concluded that secondhand smoke is a significant cause of workplace death (and has paid claims for compensation in that regard), the WCB does not include an estimate of secondhand smoke workplace deaths in *Lost Lives*.

Released on the eve of the implementation of the WCB's province-wide ban on workplace exposure to secondhand smoke, *Deadly Fumes* underscores the necessity for the ban's implementation – workers are suffering and dying from an easily preventable cause. And while many causes of workplace death are difficult to predict and prevent, deaths from secondhand smoke are predictable and preventable by the cost of a \$1.00 "No-Smoking" sign.

In recognition of secondhand smoke's impact on worker health, the WCB implemented a province-wide workplace smoking ban in April of 1998. This ban applied to all workplaces except those in the hospitality sector (i.e. restaurants, bars, bingo halls, etc.) and long-term care. Presumably, the delay was intended to give those remaining workplaces time to adjust to the upcoming change. And while secondhand smoke workplace deaths have undoubtedly been reduced through this partially-applied ban, the most heavily contaminated workplaces are those in the hospitality sector.

We wish to point out that *Deadly Fumes* is not intended to minimize the seriousness of any other cause of workplace death. Numbers in and of themselves do not convey the true human cost in terms of suffering and loss. Every workplace death is tragic and should be prevented.

In arriving at this report, we relied upon many respected health authorities, including:

World Health Organization; Physicians for a Smoke-Free Canada; American Heart Association; University of California Department of Preventative Medicine (Berkeley); Office of the US Surgeon General; Repace Associates Secondhand Smoke Experts; Canadian Council on Smoking and Health; Americans for Non-Smokers' Rights; Action on Smoking & Health USA; Clean Air Coalition of BC; Canadian Heart and Stroke Foundation; Canadian and American Cancer Societies; US and California EPA; Canadian and American Lung Associations; US National Academy of Sciences; US National Cancer Institute and Institute of Health.

In addition, we thank those organizations which provided direct assistance and were able to lend their specific expertise. References are contained in the text hereof. Additional references may be read online at <http://www.safework.ca>.

We welcome any comments or criticisms. Most importantly, on behalf of workers, we welcome the upcoming implementation of the WCB's province-wide ban.

August, 2001

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Toxic Secondhand Smoke

Secondhand smoke is a toxic combination of over 4000 chemicals, over 40 of which are known or suspected carcinogens. Secondhand smoke itself is classified as ***a known human carcinogen*** to which there is no safe level of exposure (US Dept. of Health and Human Services, 9th Report on Carcinogens, Jan. 2001). No local or international health authority, nor the tobacco industry, has established an acceptable exposure level to it. Since there is no known safe level of exposure, any exposure is unacceptable. All workers, including those in the hospitality industry, have a right to be protected from secondhand smoke.

“There is no known safe level of exposure to secondhand smoke. There are at least 42 known or suspected cancer-causing agents in tobacco smoke. Secondhand smoke is responsible for an excess of deaths and disability from heart disease, lung cancer, asthmatic attacks, and other diseases and cancers. No worker should be exposed to this hazard.” Dr. Perry Kendall, BC Prov. Health Officer

“Now, scientific consensus has been established – exposure to secondhand smoke causes lung cancer, heart disease and many other diseases. Moreover, scientists around the world agree – the only safe level of exposure to secondhand smoke is no exposure at all.” Ontario Tobacco Research Unit, UofT. Environmental Tobacco Smoke: Protection from secondhand tobacco smoke in Ontario. A review of the evidence regarding best practices. May 2001

Secondhand smoke is the third leading cause of preventable death in Canada, surpassed only by active smoking and alcohol.

“Secondhand smoke is harmful to all those exposed to it – adults, children, smokers and non-smokers alike. That secondhand smoke is classified ‘as a known human carcinogen by the US National Toxicology Program’ should elicit concerted action in all countries to eliminate, insofar as possible, all involuntary exposure to tobacco smoke.” The Ontario Tobacco Research Unit. Environmental Tobacco Smoke: Protection from secondhand tobacco smoke in Ontario. A review of the evidence regarding best practices. A report of the Ontario Tobacco Research Unit, UofT, May 2001

“In 1997, results of an analyses of 38 studies found that non-smoking women who lived with a smoker had a 24% increased risk of contracting lung cancer than non-smoking women who lived with a non-smoker.” Kackshaw AK, Law MR and Wald NJ. The accumulated evidence on lung cancer and environmental tobacco smoke. British Medical Journal. 1997; 315: 980-988.

“Exposure to secondhand smoke is a public health concern because it is a major cause of preventable illness and death in British Columbia, killing an estimated 500 non-smokers annually, and disabling thousands more.” BC Government, Ministry of Health, Secondhand Smoke: more dangerous than you realize, Health File #30, December 2000

“Women who have never smoked but who have been exposed to secondhand smoke have a significantly increased risk of developing breast cancer.” Lash TL, Aschengrau A. Active and Passive Cigarette Smoking and the Occurrence of Breast Cancer, American Journal of Epidemiology. 1999; 149(1): 5-12

“A recent study found that pre-menopausal women who never smoked and were regularly exposed to secondhand smoke, were twice as likely to develop breast cancer as those who weren’t exposed to secondhand smoke.” Johnson KC, Hu J and Mao Y. Passive and active smoking and breast cancer risk in Canada, 1994-1994. The Canadian Cancer Registries Epidemiology Research Group. Cancer causes and controls, 2000; 11(3);211-221.

“In a study of 32,000 US female nurses, it was found that regular exposure to secondhand smoke nearly doubles the risk of heart attacks.” Kawachi I, Colditz GA, Speizer FE, Manson JE, Stampfer MJ, Willett WC, Hennekeens CH. A study of passive smoking and coronary heart disease. Circulation. 1997;95(10); 2374-9

“Recent research found that male and female non-smokers exposed to secondhand smoke are 82% more likely to suffer a stroke than people who aren’t exposed.” Bonita R, Duncan J, Truelsen T, et al. Passive smoking as well as active smoking increases the risk of acute stroke. Tobacco Control. 1999;8:156-160

Even the tobacco industry knows that secondhand smoke is a killer:

“The tobacco industry has had evidence of the dangers of secondhand smoke for decades. The tobacco industry considered this knowledge so potentially devastating that it has engaged in a relentless and ruthless series of assaults on the scientific rationale behind more than 800 local clean air ordinances in the US” Headden S, Secondhand Smokescreen: Tobacco Firms Worried for Years about Risks of Passive Smoking” US News, August 3, 1998.

Previously-secret tobacco industry documents (now available on the web) reveal that the industry has extensive knowledge about secondhand smoke, for example:

“In the case of carcinogens, smoke contains not just one carcinogen but a galaxy of them.” Roe FJC, Comments on Eliminate, Modify or Neutralize. July 21, 1986 p.2, World No Tobacco Day Documents, <http://www.tobaccopapers.org/documents/psc89.pdf>, Physicians for a Smoke-Free Canada website

“We need to be candid with ourselves in recognizing that it will never be established that there are no effects [from secondhand smoke exposure].” Tobacco Institute document site <http://www.tobaccoinstitute.com> Report on Public Smoking Issue, Executive Committee. April 10, 1985, Accessed the end of March 2001

Workplace Exposure

Even a cursory glance at the scientific research reveals that secondhand smoke is a significant cause of workplace disease and death. The presence of secondhand smoke in the workplace is well documented. Exposure is also proven by measuring metabolized nicotine (cotinine) in blood serum, saliva and urine. Additionally, exposure is also proven through detection of nicotine, respirable smoke particulates, tobacco specific nitrosamines and other smoke constituents in the workplace breathing space.

A recent Health Canada study published in the International Journal of Cancer found that workers in pubs and restaurants can see their risk of lung cancer triple. Dr. Kenneth Johnson, the lead researcher confirmed: *“These data absolutely back a smoking ban in bars.”* Johnson KC, Hu J, Mao J, Canadian Cancer Registries Epidemiology Research Group Surveillance and Risk Assessment Division, Center for Chronic Prevention and Control. Lifetime residential and workplace exposure to environmental tobacco smoke and lung cancer in never-smoking women, Canada 1994-97. International Journal of Cancer, Vol. 93, Issue 6, 2001; 902-906.

Dr. Roberta Ferrence, director of the Ontario Tobacco Research Unit commented on this study:

“What’s important about this research is it demonstrates a dose-response: The more exposure you have, the higher your risk. While this may seem obvious, it has long been contested by the [tobacco] industry.” “These data absolutely back a smoking ban in bars.”

This study, and many others, confirm that hospitality workers are the workers who are most heavily exposed to secondhand smoke. Because risk increases with the level of exposure, those workplaces which present the highest level of exposure will suffer the heaviest burden of disease and death.

“The cotinine level varies depending upon occupations, with higher cotinine concentrations for those occupations where workers are exposed to higher levels of tobacco smoke; such as in restaurants, bars and bowling alleys.” Ninth Report on Carcinogens, US Department of Health and Human Services. January 2001

“Workers in bars, restaurants, bingo halls, and gaming establishments receive 4 to 6 times the exposure to secondhand smoke as the general public.” “Levels of environmental tobacco smoke in restaurants were approximately 1.6 to 2.0 times higher than in office workplaces or other businesses and 1.5 times higher than in residences with at least one smoker. Levels in bars were 3.9 to 6.1 times higher than in offices and 4.4 to 4.5 times higher than in residences.” “Environmental tobacco smoke is a significant occupational health hazard for food-service workers. To protect these workers, smoking in bars and restaurants should be prohibited.” Siegel M. Involuntary Smoking in the Restaurant Workplace; Review of employee exposure and health effects. Journal of the American Medical Association. 1993; 270(4):490-493

A unique aspect of workplace exposure to secondhand smoke is that it is not present in the workplace as a result of a manufacturing or work process. Its presence is discretionary, easily identified and easily removed without complex or costly engineering methods by banning the source of the pollution, the burning cigarette.

Canadian cigarette pack warnings (see Appendix) proclaim 'to the world' the dangers of secondhand smoke. Users (smokers) of the product in the workplace who ignore these warnings, coupled with business owners who permit them to do so, are allowing workers to be indefensibly and unjustifiably exposed. Such blatant flouting of product warnings is not tolerated with any other product (seat belts, for example).

A report entitled *Smoking and Restaurants: A Guide for Policy-Makers* (Univ. of Cal., Berkeley/SF Preventative Medicine Residency Program) published prior to California's statewide smoking ban, concluded that:

- *Involuntary smoking is the third leading cause of preventable death, behind only active smoking and alcohol.*
- *The cancer mortality from involuntary smoking alone exceeds the combined mortality from all regulated environmental carcinogens. While involuntary smoking is the **number one cause of environmental cancer**, it is essentially unregulated.*
- *In California, waitresses have the highest mortality of any female occupational group. Compared to all other women, they have almost 4 times the expected heart disease mortality rate.*
- *Heavily exposed restaurant workers have 2-3 times higher levels of carcinogens in their blood than persons with typical tobacco smoke exposure, and have higher levels of mutagenicity in their urine.*
- *Restaurant tobacco smoke pollution exposure is about 3-5 times higher than typical workplace exposure.*
- *Restaurant employee tobacco smoke exposure is about 8-20 times higher than domestic exposure.*
- *Restaurant air causes gene mutations at a rate 10-100 times higher than previously measured urban outdoor and indoor air.*
- *The mutagenic potency of restaurant air is 5-10 times that of "high risk" industrial workplace air.*

In the Survey on Smoking in Canada (1994/5), it was found that 60% of employed Canadians (about 7 million people) worked in workplaces that had little or no restriction on workplace smoking. In BC, about 50% of the workforce (about 1.5 million people) worked in places where at least some smoking was allowed.

Since this Survey, the situation has improved (for example, the implementation of by-laws restricting smoking). However, the highest workplace exposures occur in the hospitality workplace (restaurants, bars, casinos) where there is still a lack of protection.

Ventilation: No Solution

Ventilation provides no solution to the health dangers posed by secondhand smoke. A thorough compilation of authoritative opinion which so confirms can be viewed at <http://www.safework.ca>

The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) is a professional technical society that develops ventilation standards. The American National Standards Institute (ANSI) has chosen ASHRAE as the accredited ANSI standards developer.

ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, is a national standard approved by both ASHRAE and ANSI. Many regulatory bodies around the world, including jurisdictions in Canada, rely on this Standard 62 and incorporate all, or parts of it, in their respective legislation.

On June 25, 1999 ASHRAE issued a press release stating “*Since ANSI/ASHRAE Standard 62-1989 was published, a number of prominent health organizations identified environmental tobacco smoke as a significant health risk. When they make pronouncements like that, ASHRAE has to listen.*” Accordingly, ASHRAE approved “addendum e” to the standard which eliminated all reference to smoking being permissible and removed reference to supplemental smoke removal equipment (i.e. air cleaning equipment). Standard 62 now assumes a smoke-free workplace and validates the futility of ventilation as a control of toxic secondhand smoke.

ASHRAE has stated that it is not qualified to establish an acceptable safe level of exposure to secondhand smoke, considering that it contains over 40 known human carcinogens, many of which alone have no safe level of exposure.

Interestingly, we understand that the Neighbourhood Pub Association of BC joined forces with the tobacco industry and appealed the inclusion of Addendum e in the Standard 62. ASHRAE denied the appeal. The industry then appealed to ANSI, which also denied the appeal. ANSI’s approval of Addendum e means the Institute has determined ASHRAE’s consensus guidelines have been met. Comments from the ASHRAE Appeals Panel regarding the appellants’ appeals include:

- a) *Despite potential economic impact, the Panel has been directed and is obligated to ensure that the body of the standard is consistent with its purpose.*
- b) *With respect to the health impacts of ETS, the Panel is acting on the basis of current best knowledge, i.e., from cognizant health authorities.*
- c) *While smoke removal equipment may be useful for comfort purposes where smoking may occur, its effectiveness for health effects has not been adequately demonstrated.*

The Public Supports the WCB's Ban

75% of British Columbians support a province-wide ban on workplace exposure to secondhand smoke (Angus Reid Survey, commissioned by the Clean Air Coalition of BC, June 2000).

This finding is consistent with the findings of the National Population Health Survey, conducted by Statistics Canada in 1996/7. This Survey found that 88% of current smokers and 95% of non-smokers agreed that non-smokers should have a smoke-free work area.

Economic Impact

Those interests opposed to smoking bans have repeatedly stated that smoking bans will cause business, particularly in the hospitality sector, to suffer economic hardship. However, their "doom and gloom" scenario does not materialize when bans are actually put in place. Numerous jurisdictions have implemented smoking bans with little or no negative effect on business. Statistics indicate that business may even improve as a result.

"The Capital Regional District Clean Air Bylaw has had a positive effect on frequency of patronage at public entertainment facilities. Residents say they visit restaurants, cafes, neighbourhood pubs, food fairs and bars more often now that the smoking bylaw is in effect." Angus Reid Group surveys 1995-2000, commissioned Capital Regional District

"Sales figures compiled by the BC Liquor Distribution Branch show no negative impact on business [after going smoke-free] for Greater Victoria hospitality venues after 9 months. In fact, a 4.5% increase in retail liquor sales at neighbourhood and marine pubs, and 1.7% increase at all licensed establishments was reported." BC Statistics, Liquor Distribution Branch, 79th Annual Report, 1999/2000.

"For the first year following a California-wide smoking ban, an additional \$880 million of taxable sales were made in California's beer, wine and liquor serving establishments; also, the rate of growth in beer, wine and liquor serving establishments outpaced all retail outlet taxable sales by 7.7 percent." Final Taxable Sales Figures for Bars and Restaurants for the Fourth Quarter and Year End, 1998, Contact: Gregory Oliva, MPH, Department of Health Services (916)445-2563 (California went smoke-free in 1998)

"State Revenue Figures show that business in Maine restaurants increased by 7% after the first three quarters that a smoking ban was in place." The Salt Lake Tribune, Maine Declares Restaurant Smoke Ban a Success, Sept. 19, 2000

"Payroll statistics by the BC WCB revealed that going smoke-free had no negative impact on business for Victoria, BC hospitality venues." Clean Air Coalition newsletter, "Clean Air Brings Good Cheer", December 1999

“Prohibiting smoking in Flagstaff, Arizona, restaurants has had no effect on restaurant sales.” Sciacca JP, Ratliff MI. Prohibiting smoking in restaurants; effects on restaurant sales. American Journal of Health Promotion 1998; 12(3): 176-184

“Sales tax data for 15 cities with smoke-free restaurant ordinances shows that smoke-free ordinances do not adversely affect either restaurant or bar sales.” Glantz SA, Smith LRA. The effect of ordinances requiring smoke-free restaurants and bars on revenues: a follow-up. American Journal of Public Health. 1997; 87(10):1687-1693

BC Workplace Death Toll – Secondhand Smoke

Deaths from secondhand smoke occur many years after initial exposure and following an unknown accumulated threshold level. Exposure occurs often at many sites (workplace, home, etc.). Lung cancer is often discovered in the advanced stage of the disease (typically, by the coughing up of blood) and the life expectancy from that point forward is often less than one year. Making a compensation claim is not likely first on the lung cancer sufferer’s list.

Scientific research reveals that *“For every eight smokers the tobacco industry kills, it takes one nonsmoker with them.”* (Glantz SA, Parmley W. Passive Smoking and Heart Disease: Epidemiology, Physiology and Biochemistry Circulation 1991; 83(1): 1-12 and Taylor A, Johnson D & Kazemi H. Environmental Tobacco Smoke and Cardiovascular Disease, Circulation, 1992; (86): 699-702.)

“Exposure to secondhand smoke is a public health concern because it is a major cause of preventable illness and death in British Columbia, killing an estimated 500 non-smokers annually and disabling thousands more.” Government of BC, Ministry of Health, Secondhand Smoke: More dangerous than you realize. Health File #30, December 2000.

The BC Ministry of Health estimated that 37 lung cancer deaths occur annually in BC from secondhand smoke in the workplace (Quarterly Digest, May 1993). Therefore, for the 10 year period 1989 to 1998, it is estimated that approximately 370 work-related lung cancer deaths occurred in BC. Heart disease deaths occur at 10 times that of lung cancer (American Heart Association, Scientific Statement, Volume 86, No 2/92, re-confirmed November 29, 1999). Therefore, for the 10 year period 1989 to 1998, it is estimated that approximately 3,700 heart disease work-related deaths occurred in BC.

Number of Deaths	Secondhand Smoke Disease
370	Lung cancer
3,700	Heart disease

We emphasize that these numbers represent only the lung cancer and heart disease deaths from secondhand smoke. No numbers have been included for other causes of

secondhand smoke-caused death. Secondhand smoke is a known or suspected cause of death due to nasal cancer, stroke, breast cancer, cervical cancer, bladder cancer, lymphoma, asthma attacks, and a host of other deadly diseases.

It should be noted that recent estimates for heart disease and lung cancer deaths due to secondhand smoke in California are in the range of 4,500 to 7,800 deaths annually (Wells JA. Heart Disease from Passive Smoking in the Workplace, Journal of the American College of Cardiology 1998; 31: 1-9: Lung cancer from Passive Smoking at Work. American Journal of Public Health 1998; 88: 1025-1029). When these estimates are applied to British Columbia, the range is 450 to 780 deaths, annually.

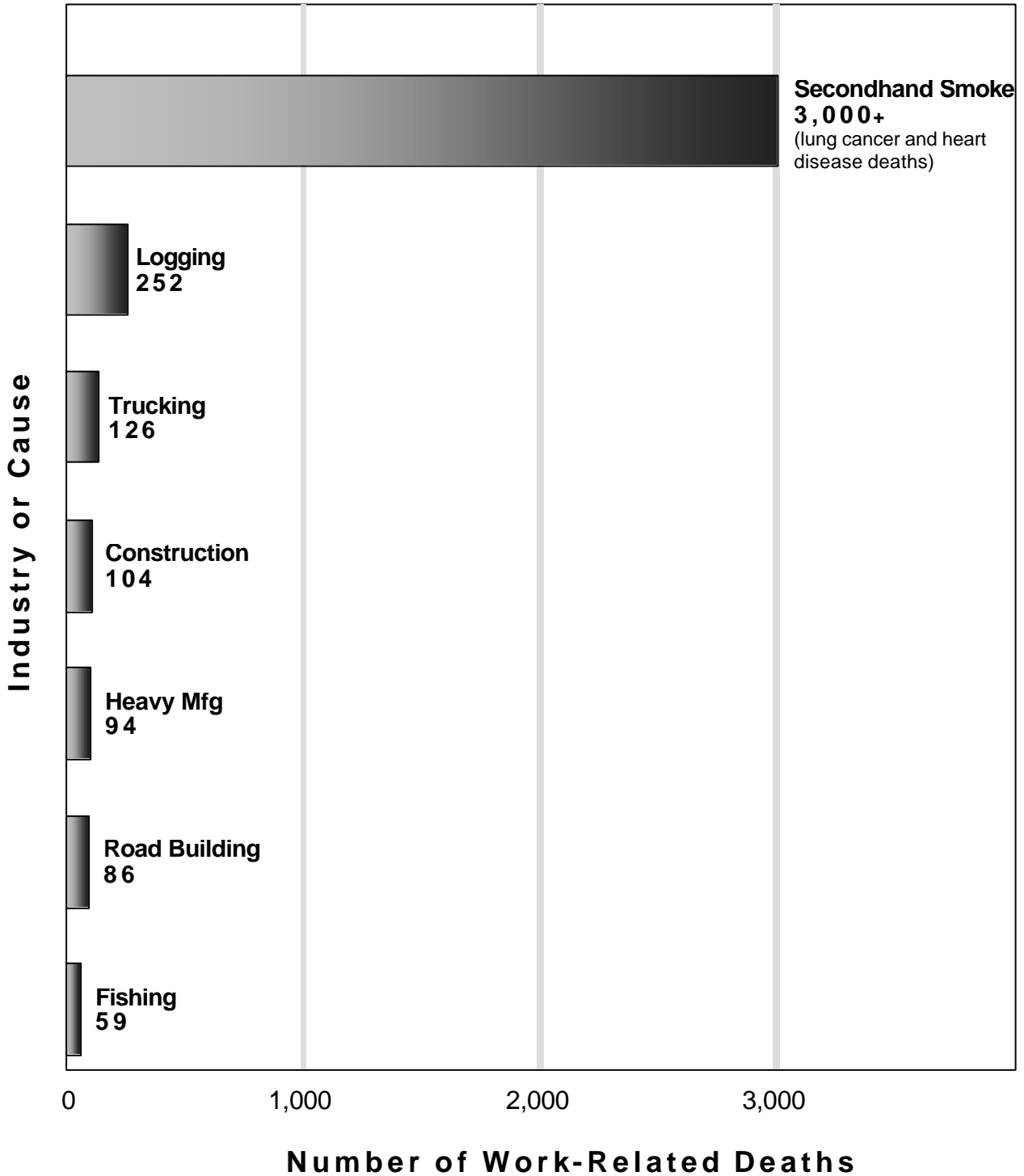
The WCB's Lost Lives looks at the tragic issue of workplace death and covers the 10 year period 1989 to 1998. The top six industries which suffer the most work-related deaths are:

Number of Deaths	Industry or Cause
252	Logging
126	Trucking
104	Construction
94	Heavy Mfg.
86	Road Building
59	Fishing

When the estimate for secondhand smoke is included, secondhand smoke surpasses logging as the number one cause of workplace death:

Number of Deaths	Industry or Cause
3,000 +	Secondhand Smoke
252	Logging
126	Trucking
104	Construction
94	Heavy Mfg.
86	Road Building
59	Fishing

**BC Workplace Death Toll -- 10 year period, 1989 to 1998
(7 leading causes)**



Appendix -- Canadian Cigarette Pack Warnings about Secondhand Smoke

Since 1994, cigarette packages have contained a number of rotating warnings. One of the eight warns about secondhand smoke, being:

TOBACCO SMOKE CAUSES FATAL LUNG DISEASE IN NON-SMOKERS

Effective January 1, 2001, this warning was upgraded to five warnings, being:

DON'T POISON US

WARNING: Secondhand smoke contains nicotine, carbon monoxide, ammonia, formaldehyde, benzo[a]pyrene and nitrosamines. These chemicals can harm your children.

YOU'RE NOT THE ONLY ONE SMOKING THIS CIGARETTE

WARNING: The smoke from a cigarette is not just inhaled by the smoker. It becomes secondhand smoke, which contains more than 50 cancer-causing agents.

TOBACCO SMOKE HURTS BABIES

WARNING: Tobacco use during pregnancy increases the risk of preterm birth. Babies born preterm are at an increased risk of infant death, illness and disability.

IDLE BUT DEADLY

WARNING: Smoke from a lit cigarette contains toxic substances. These include hydrogen cyanide, formaldehyde and benzene.

WHERE THERE'S SMOKE

THERE'S HYDROGEN CYANIDE

WARNING: Tobacco smoke contains hydrogen cyanide. It can cause headaches, dizziness, weakness, nausea, vertigo and stomach aches.

In addition, the inside pack slider contains the warning:

Can secondhand smoke harm my family?

Yes. The smoke from the burning tip of your tobacco product and the smoke you exhale are dangerous. They can harm your family, especially your children.

Children who breathe secondhand smoke suffer more chest infections, bronchitis, ear infections and asthma attacks.

Secondhand smoke also causes death from heart disease and lung cancer in non-smoking adults.

Smoking outside is one answer. The best solution is to stop smoking.