

CONTROLLING TOBACCO SMOKE POLLUTION:
VENTILATION, SMOKING ROOMS, SMOKING BANS --
WHAT WORKS AND WHAT DOESN'T?

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**Controlling Tobacco Smoke
Pollution:
Questions to be asked and
answered.**

- **WHAT ARE THE RISKS TO BE CONTROLLED?**
- **WHAT ARE THE VARIABLES THAT DETERMINE RISK?**
- **HOW BIG IS THE EXISTING RISK?**
- **WHAT IS THE REQUIRED LEVEL OF CONTROL FOR ACCEPTABLE RISK?**
- **CAN THE PROPOSED CONTROL YIELD ACCEPTABLE RISK TO WORKERS?**
- **CAN ENFORCEMENT BE ACHIEVED AT ACCEPTABLE COST?**



WHAT ARE THE RISKS TO BE CONTROLLED?

State of California

Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant

Part B: Health Effects

As Approved
by the Scientific Review Panel
on June 24, 2005

California Environmental Protection Agency
Office of Environmental Health Hazard Assessment

TABLE ES.1
HEALTH EFFECTS ASSOCIATED WITH EXPOSURE
TO ENVIRONMENTAL TOBACCO SMOKE

Effects Causally Associated with ETS Exposure

Developmental Effects
Fetal growth: Low birth weight and decrease in birth weight
Sudden Infant Death Syndrome (SIDS)
Pre-term Delivery

Respiratory Effects
Acute lower respiratory tract infections in children
(e.g., bronchitis and pneumonia)
Asthma induction and exacerbation in children and adults
Chronic respiratory symptoms in children
Eye and nasal irritation in adults
Middle ear infections in children

Carcinogenic Effects
Lung cancer
Nasal sinus cancer
Breast cancer in younger, primarily premenopausal women

Cardiovascular Effects
Heart disease mortality
Acute and chronic coronary heart disease morbidity
Altered vascular properties

Effects with Suggestive Evidence of a Causal Association with ETS Exposure

Reproductive and Developmental Effects
Spontaneous abortion, intrauterine Growth Retardation
Adverse impact on cognition and behavior
Allergic sensitization
Decreased pulmonary function growth
Adverse effects on fertility or fecundability

Cardiovascular and Hematological Effects
Elevated risk of stroke in adults

Respiratory Effects
Exacerbation of cystic fibrosis
Chronic respiratory symptoms in adults

Carcinogenic Effects
Cervical cancer
Brain cancer and lymphomas in children
Nasopharyngeal cancer
All cancers - adult and child

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WHAT ARE THE VARIABLES THAT DETERMINE RISK?

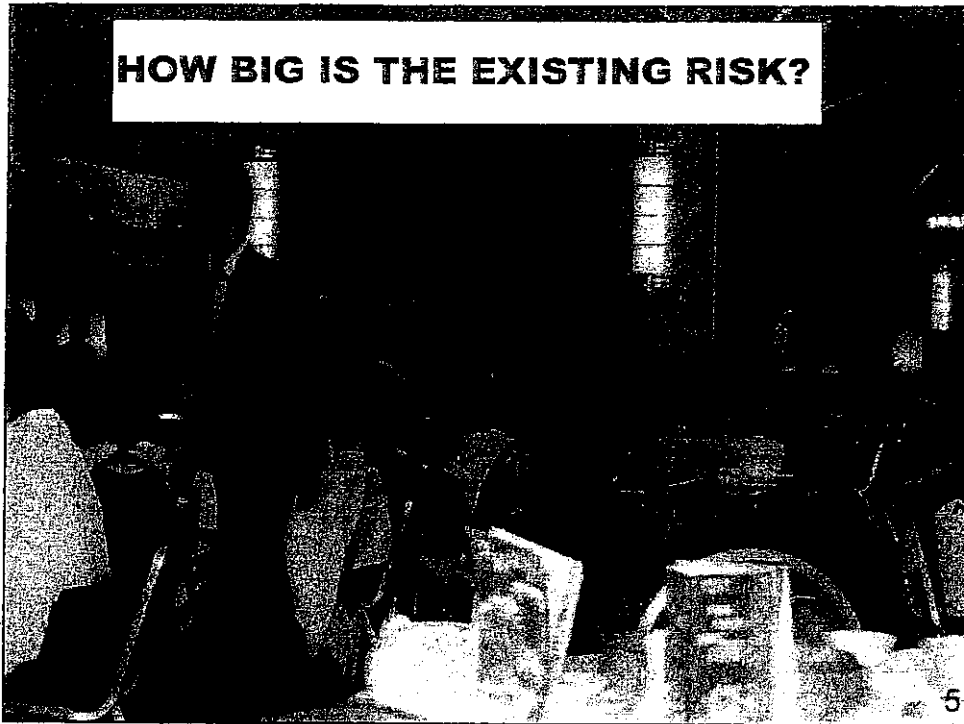
VARIABLES DETERMINING SECONDHAND SMOKE (SHS) POLLUTION LEVELS :

- **NUMBER OF SMOKERS**
- **SMOKING RATES**
- **CIGARETTE, PIPE, CIGAR EMISSIONS**
- **SIZE OF ROOM**
- **VENTILATION RATE**

**BOTTOM LINE: SMOKING POLICIES
AND DESIGN VENTILATION RATES.**

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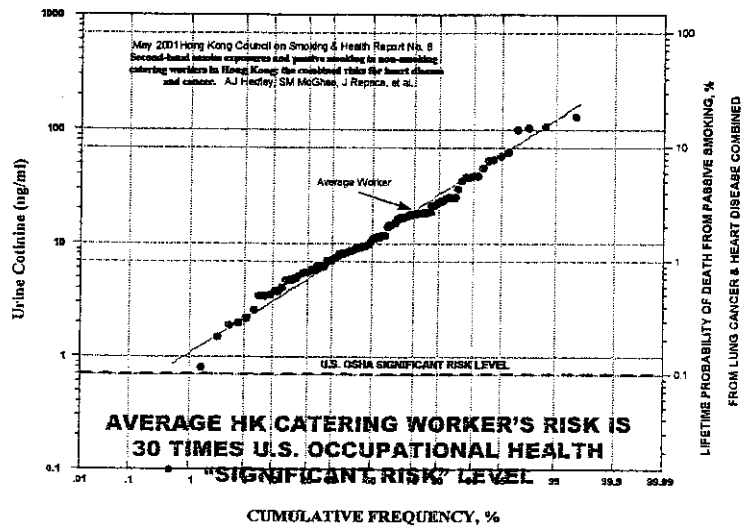
HOW BIG IS THE EXISTING RISK?



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3 IN 100 HONG KONG CATERING WORKERS ESTIMATED TO DIE FROM PASSIVE SMOKING Over a Working Lifetime, or 150 deaths per year.
RISK TO MOST EXPOSED: 16-20 per 100.

104 Hong Kong Catering Workers Exposed Only at Work



Estimated Dose-Response = 1.44 Heart & Lung Deaths per 1000 workers per nanogram of cotinine per milliliter of urine per 45-year Working Lifetime

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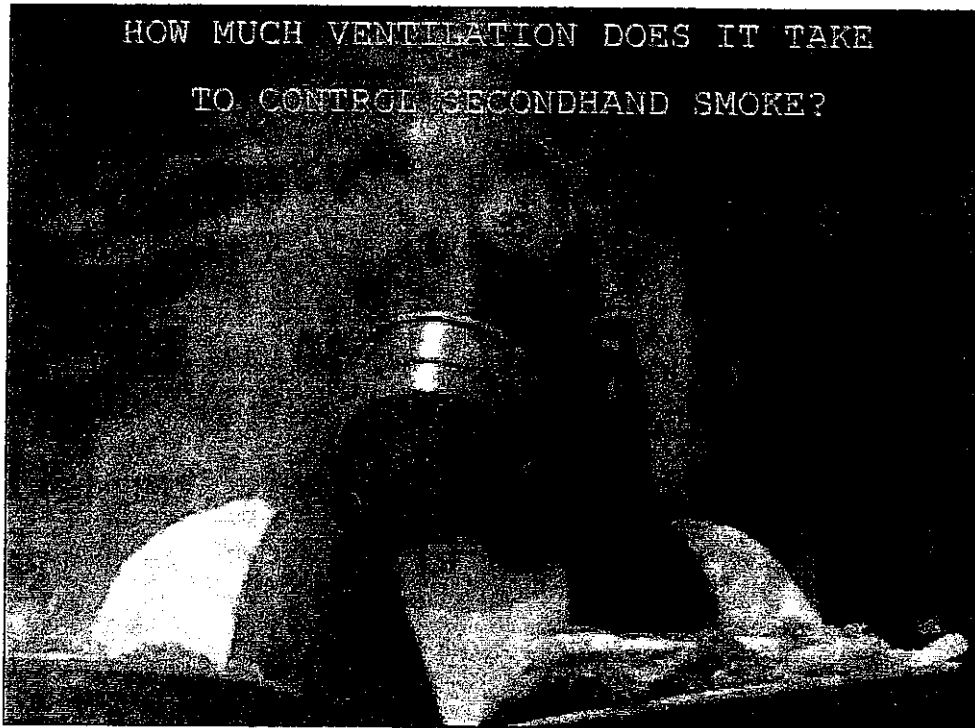
Estimated Cost Per Life Lost from Passive Smoking: ~HK\$35 million

- Cost of passive-smoking mortality among 200,000 catering workers (64% of them nonsmokers), (150 deaths per year) times (US \$4.5 million per life lost from pollution)* = US \$675 million/year. Assuming a life in Hong Kong is valued the same as a life in the U.S., this is an estimated (US \$675 million/year) times (7.75 Hong Kong dollars/ U.S. dollar) = HK \$5.2 billion/year.
- *(U.S. Environmental Protection Agency, Washington, DC, 1997. The Benefits and Costs of the Clean Air Act: 1970-1990. EPA Report 410-R-97-002.)
- Such estimates must be balanced against any estimated losses to industry from a smoking ban.



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HOW MUCH VENTILATION DOES IT TAKE
TO CONTROL SECONDHAND SMOKE?




How Much Ventilation Would be Required to Control Tobacco Smoke Pollution In Hong Kong?

- HK ventilation rate is 4.5 litres/second-occupant
- HK restaurant seating is 67 persons/100 m²
- Assuming a 4 metre ceiling: 2.7 air changes/hour
- Average worker has 3,000/100,000 lifetime risk
- *De minimis* risk level is 1 death/1,000,000 persons
- To attain *de minimis* risk, ventilation must be increased by 30,000 times, to 81,000 air changes per hour, or 135,000 litres/second per occupant
- Can ventilation deliver such rates of air exchange?

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It would take
VENTILATION
at 81,000
air changes per hour
TO YIELD
ACCEPTABLE RISK
For Hong Kong
Catering Workers
From
Secondhand Smoke



Report II: Controlling
Tobacco smoke pollution:
ASHRAE 150 Application
& (2015) 11-15 (2009)

TORNADO-like rates of air flow are necessary to
attain acceptable risk from secondhand smoke

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The Standard

China's Business Newspaper

Wednesday, September 21, 2005

PRINT SAVE CMAIL

SECTIONS

- Business
- Metro
- Focus
- Opinion
- Markets
- World
- Sports
- Entertainment

SPECIALS

- Monday Money
- Property
- Macau
- Weekend

Metro

Bars and karaoke try to stub out smoking ban

Entertainment industry advocates are making a last-ditch effort to make their voices heard by releasing figures showing discrepancies between the government's surveys on smoking bans at bars and karaoke and their own.

Mimi Lau

Wednesday, September 21, 2005

WHY SHOULD ENTERTAINMENT VENUES BE EXEMPT FROM A SMOKING BAN?

Entertainment industry advocates are making a last-ditch effort to make their voices heard by releasing figures showing discrepancies between the government's surveys on smoking bans at bars and karaoke and their own.

They have also called for an open meeting on October 6 at the Legislative Council at which 60 industry representatives can air their views to health chief York Chow.

"The government's findings were based on the dining industry, but there is a big difference between drinking and dining. There is a close link between cigarette smoking and alcohol consumption," said Jeffery Tam, chairman of the Hong Kong Bars and Karaoke Rights Advocacy.

A spokesman for the Health, Welfare and Food Bureau said, however, the ban on smoking intends to prevent staff in bars and karaoke from inhaling second-hand smoke.

SECURITY BUREAU

LIU SHINGHUI

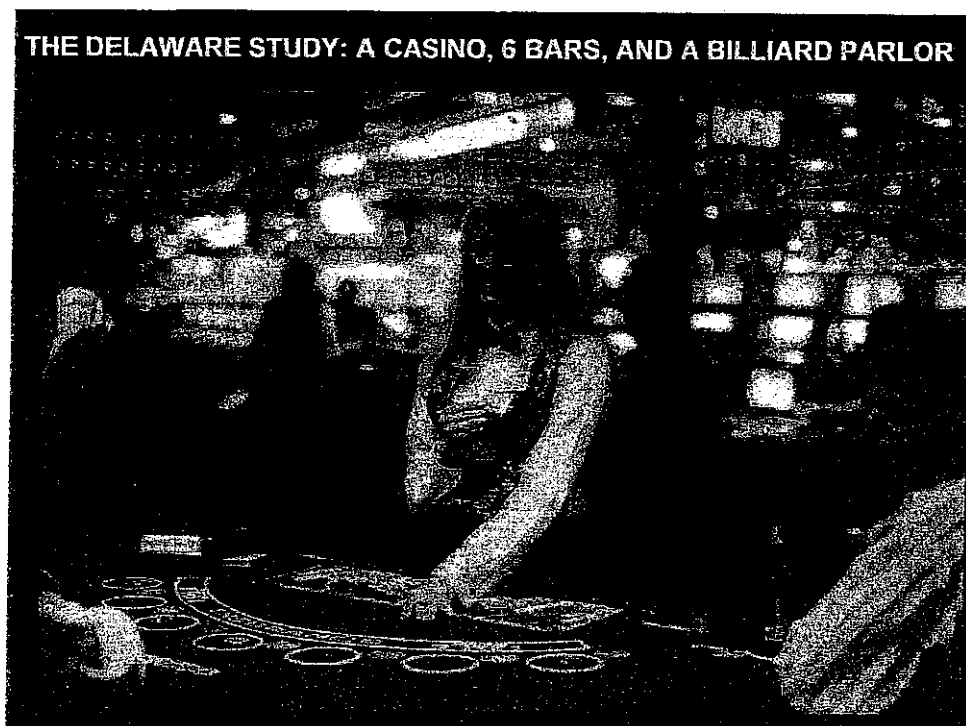
SNAPSHOT

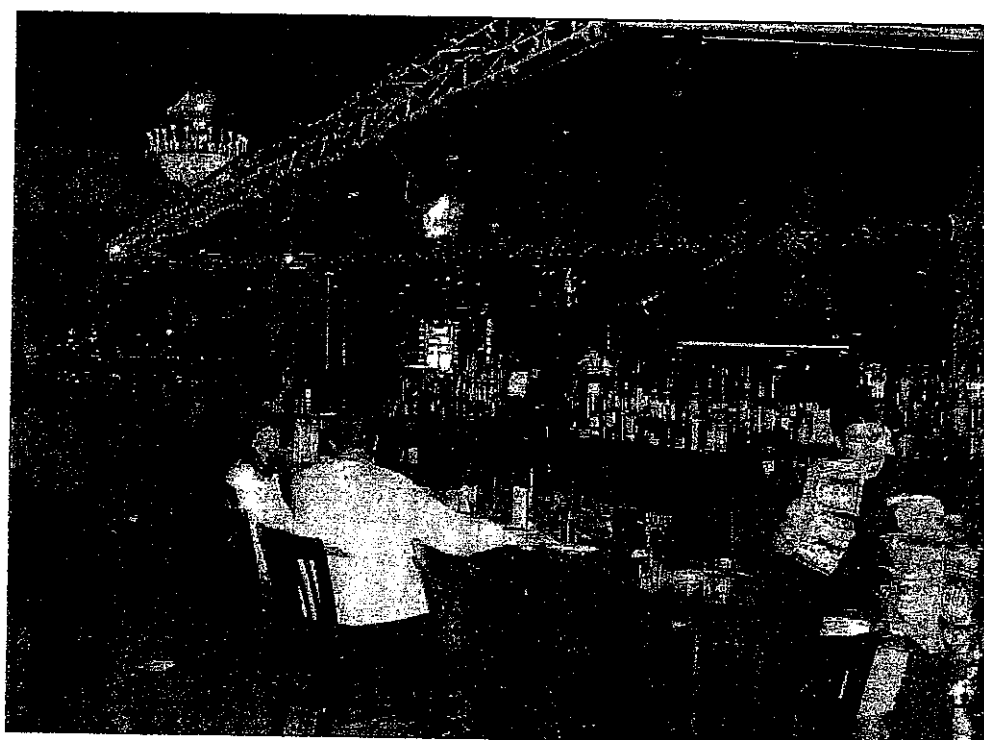
Hong Kong Index

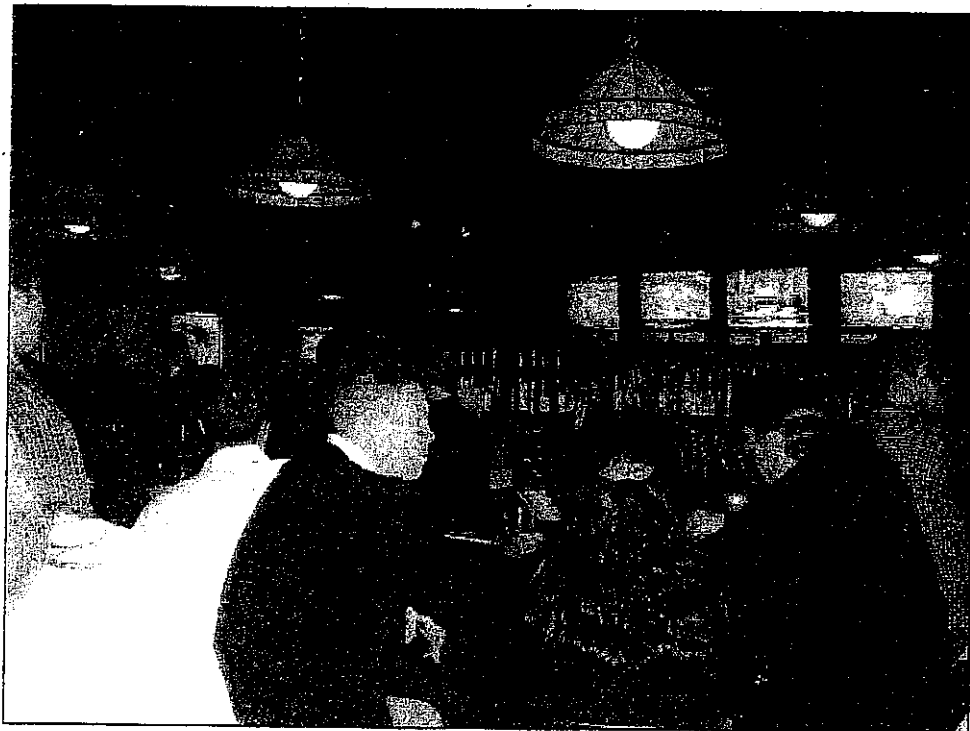
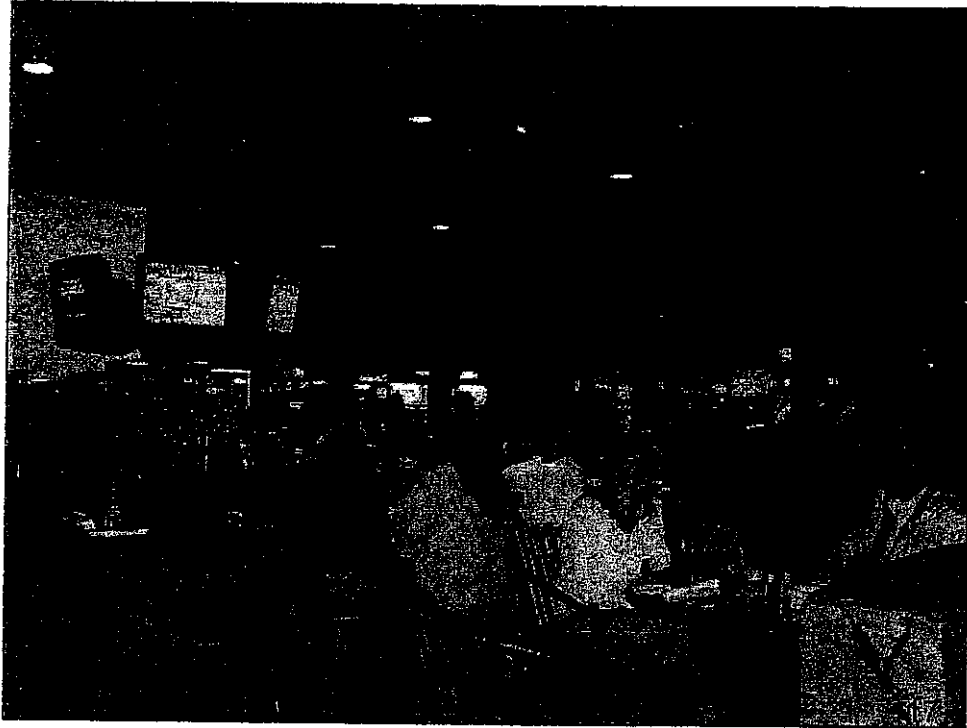
Hong Kong Sectors

Sector	Index	Change
Banking	10,000	+100
Insurance	10,000	+100
Real Estate	10,000	+100
Technology	10,000	+100
Telecommunications	10,000	+100
Transport	10,000	+100
Utilities	10,000	+100

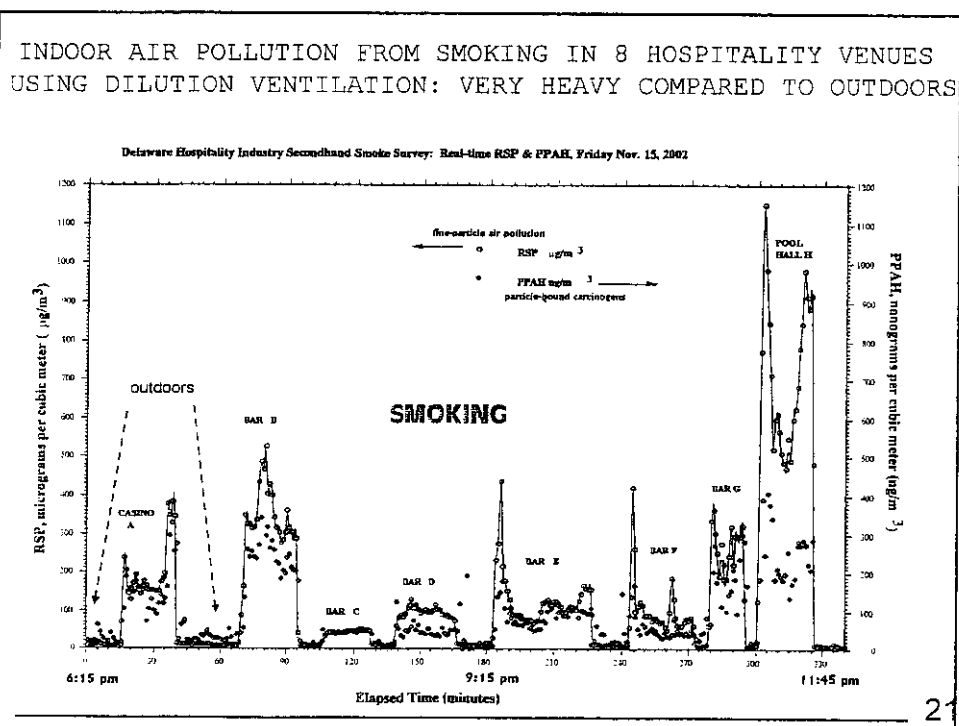






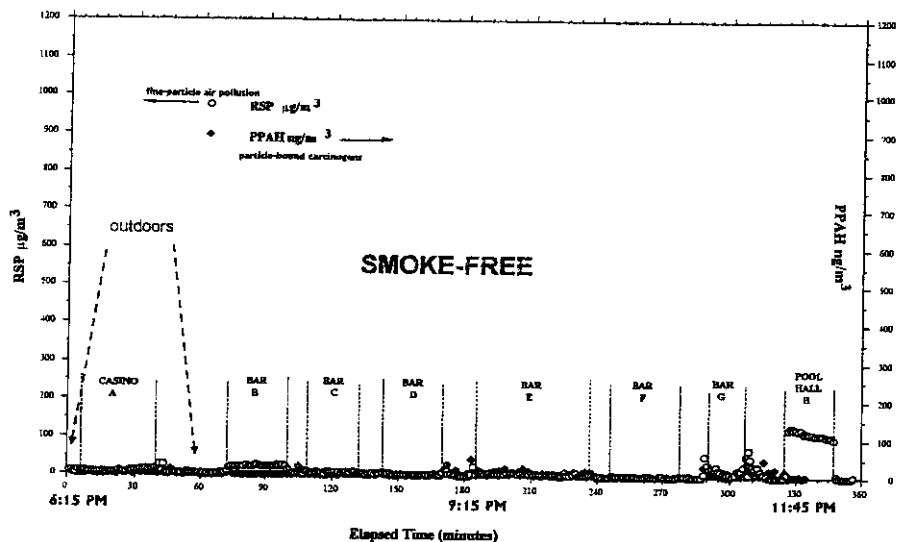






INDOOR AIR POLLUTION IN 8 HOSPITALITY VENUES AFTER A SMOKING BAN: COMPARABLE TO OUTDOOR LEVELS

Delaware Hospitality Industry Secondhand Smoke Survey: Real-time RSP & PPAH After The Smoking Ban



22.

Baltimore Highway Toll - South Beach, Carolanville, and
Wilmington Hospitality - Memorial Park, Carolanville, and

(Replaces JLNJOEM 46887-805, 2004)

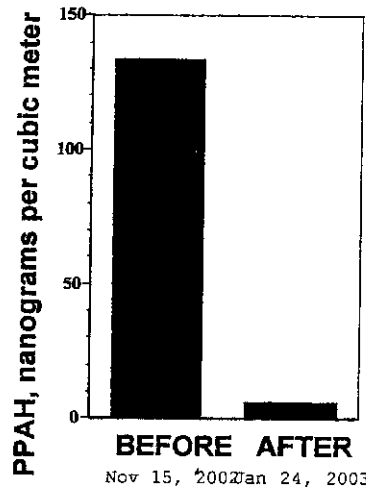
Secondhand Smoke Pollution in the Hospitality Industry is Worse than at a Highway Toll Booth



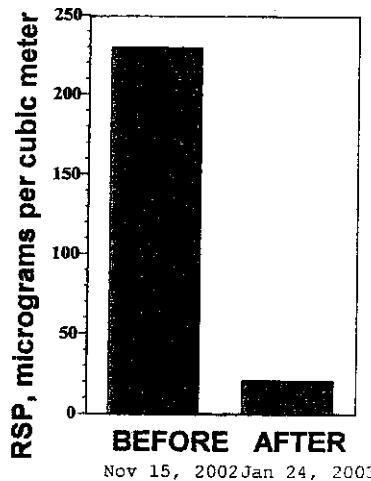
SMOKE-FREE LAW CLEARS THE AIR

Repace JL, JOEM 46:887-905 (2004)

**CARCINOGEN (PPAH)
LEVELS DROP BY 95%**



**FINE PARTICLE AIR POLLUTION
(RSP) LEVELS DROP BY 90%**



8 Delaware Hospitality Venues: Casino, 6 Bars, & Pool Hall

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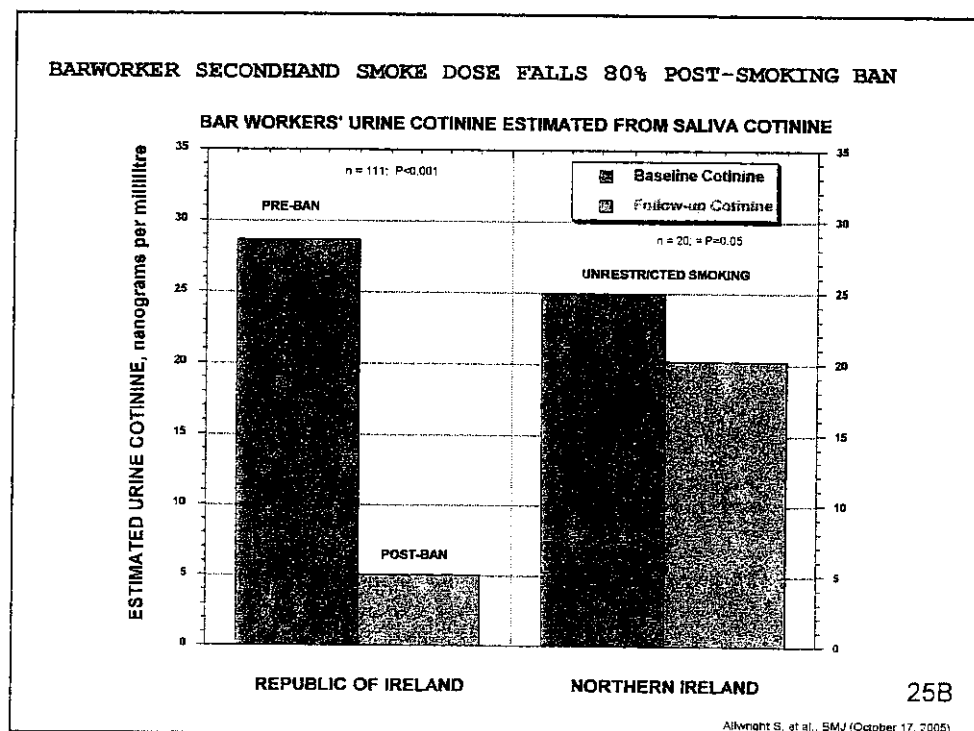
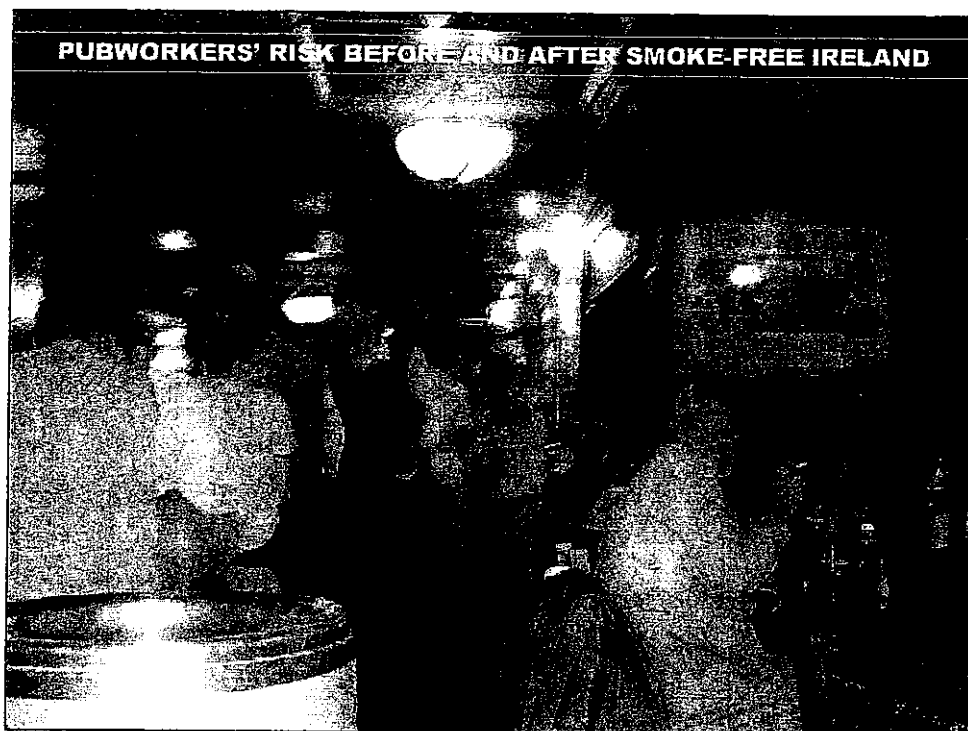
CONSEQUENCES OF DELAWARE'S SMOKE-FREE LAW

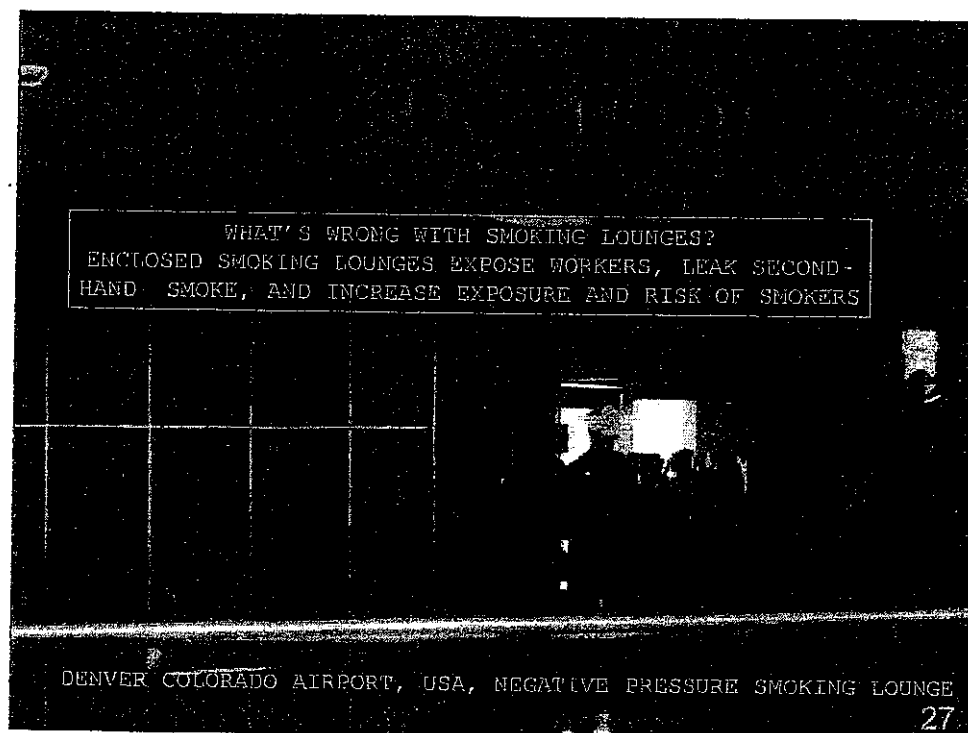
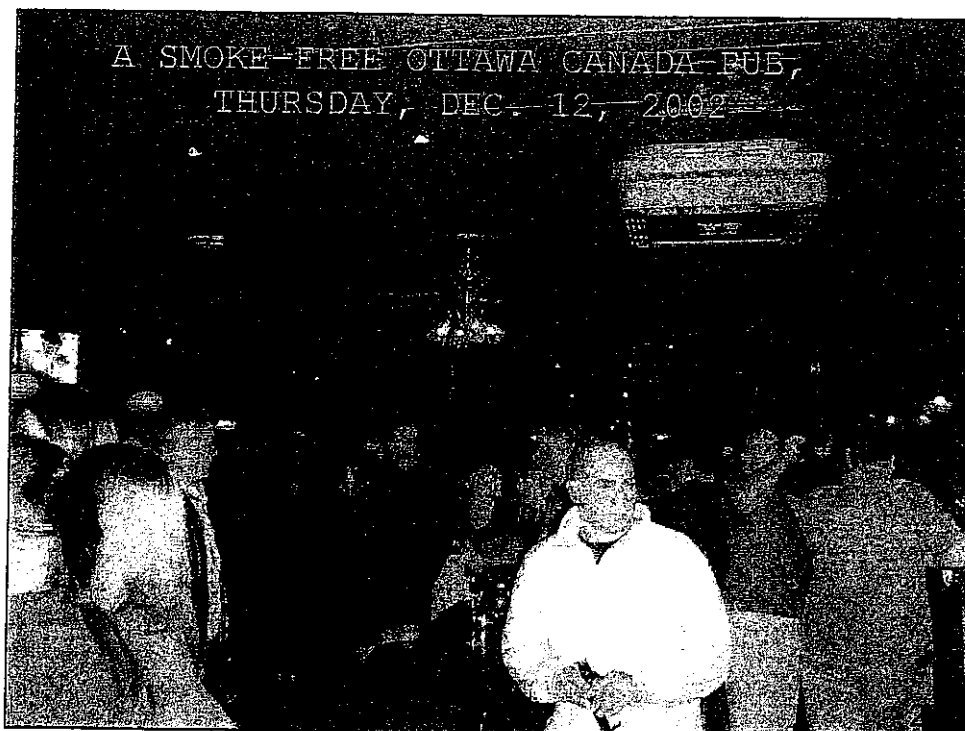
- **STATEWIDE SMOKING PREVALENCE DROPPED BY 11% AFTER 1 YEAR**
- **SMOKING PREVALENCE IN 18-24 YEAR-OLDS DROPPED BY 25% AFTER 1 YEAR**
[Repace JL, JOEM 46:887-905 (2004)]
- **REVENUES IN DELAWARE'S GAMING INDUSTRY WERE UNAFFECTED**

[Mandel LL, Alamar BC, and Glantz SA, Tobacco Control 2005;14;10-12]



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ARE DESIGNATED SMOKING AREAS ACCEPTABLE?

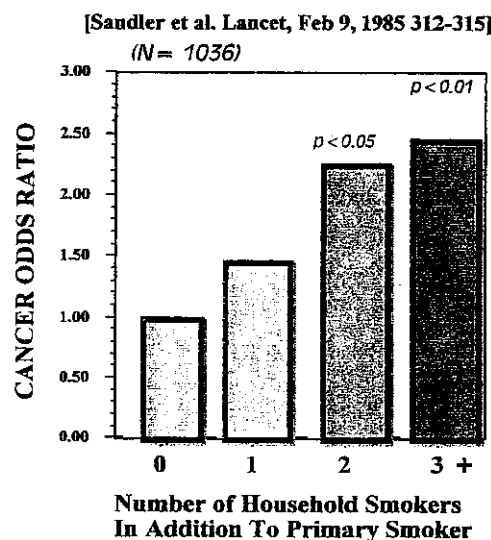
- **U.S. OSHA: "No employee will be required to work in a [designated] area where there will be contamination from [secondhand smoke]."**
- **U.S. OSHA: "To the extent that there are failures of enforcement of the [separately ventilated designated smoking area] and of the ventilation system, the risk will not be totally eliminated."**

(Federal Register, Tuesday, April 5, 1994, Part II Department of Labor - Occupational Safety and Health Administration 29CFR Parts 1910, 1915, 1926 and 1928, Indoor Air Quality; Proposed Rule.)

**SANDLER (1985): SMOKERS' RISK OF CANCER IS
INCREASED BY EXPOSURE TO OTHERS' SMOKE**

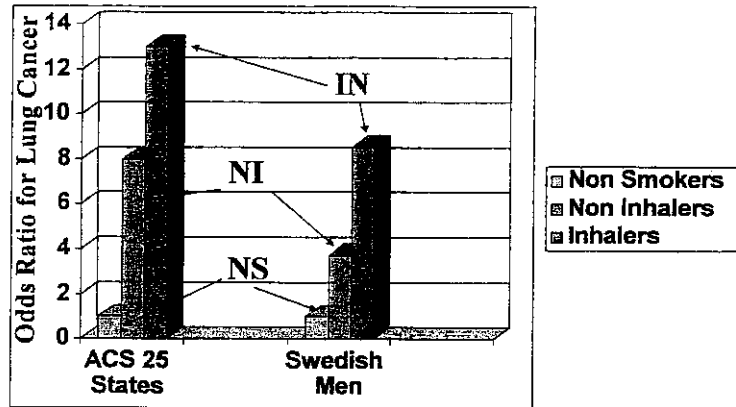
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Secondhand Smoke is Hazardous to Smokers:
Smokers living with smokers have higher
cancer risk

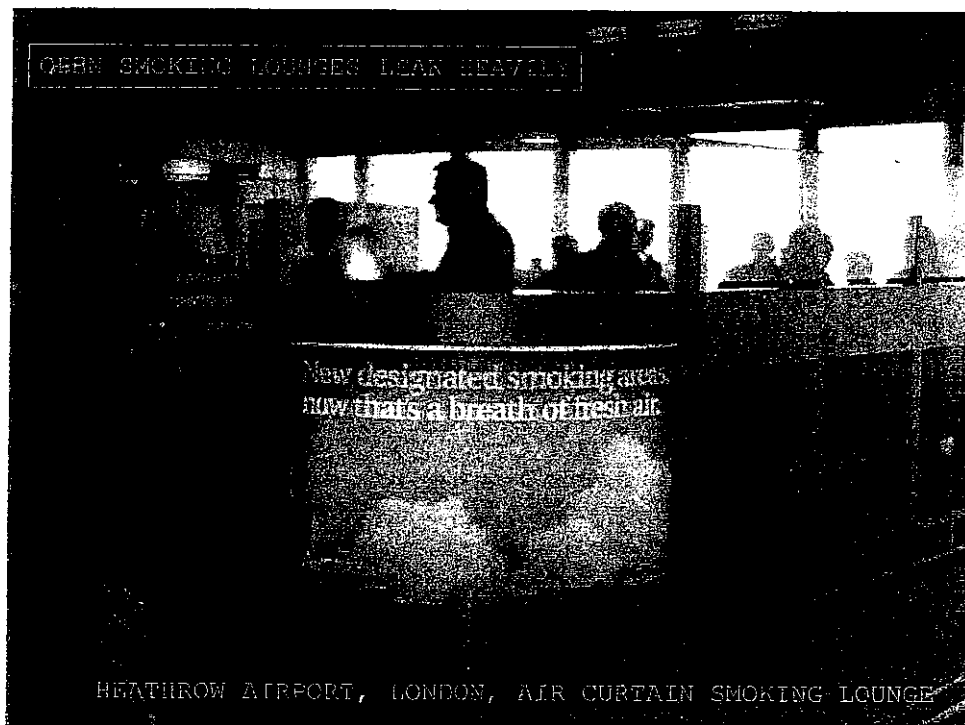


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**Lung Cancer Risks in Non-Inhaling
Cigarette Smokers Exposed to ETS are
Major Fractions of Those in Inhalers:
Secondhand Smoke is Hazardous to Smokers**



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Environmental Tobacco Smoke in the Nonsmoking Section of a Restaurant: A Case Study

RA Jenkins*, D Finn, BA Tomkins*, and MP Maskarinec*

*Oak Ridge National Laboratory, Oak Ridge Tennessee

Regulatory Toxicology and Pharmacology 34, 213-220 (2001)

Sponsored by the Hotel Association of Canada


- **“Ventilation techniques for restaurant/pubs with separate smoking and nonsmoking areas are capable of achieving non-smoking area concentrations that are comparable to those of similar facilities that prohibit smoking outright.”**

IS THIS STUDY VALID?

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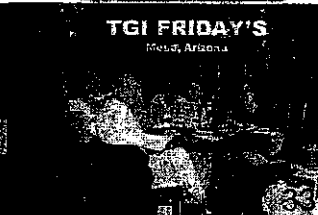


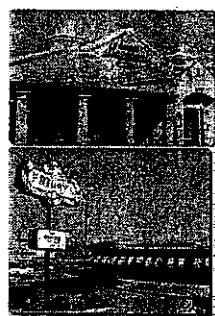

15th Annual Conference, International Society
for Exposure Analysis October 30 - November 3
2005 Tucson, Arizona

Displacement Ventilation Falls to Control Secondhand Smoke: a 3 Pub Air Quality Study



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BLACK DOG PUB
Toronto, Canada

MACARONI GRILL
Tulsa, Oklahoma

TGI FRIDAY'S
Mesa, Arizona

DIRECTED FLOW VENTILATION, 100% OUTDOOR AIR

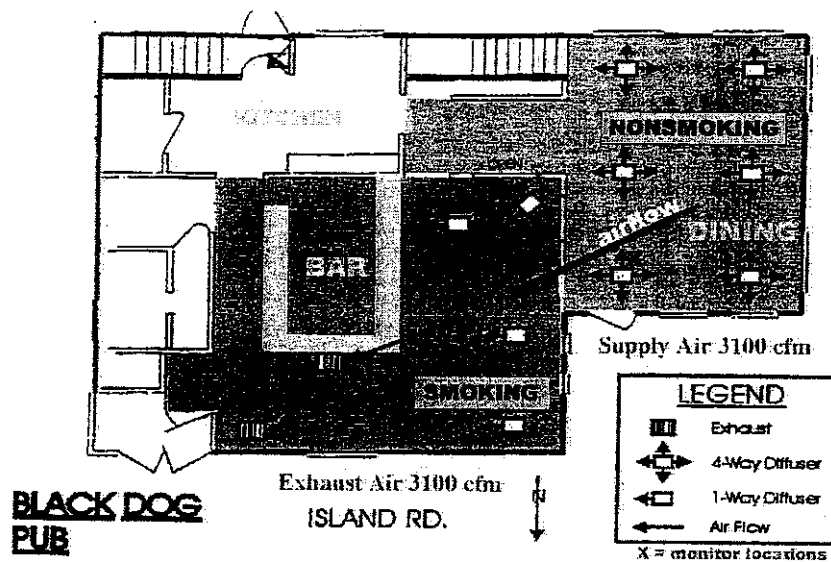
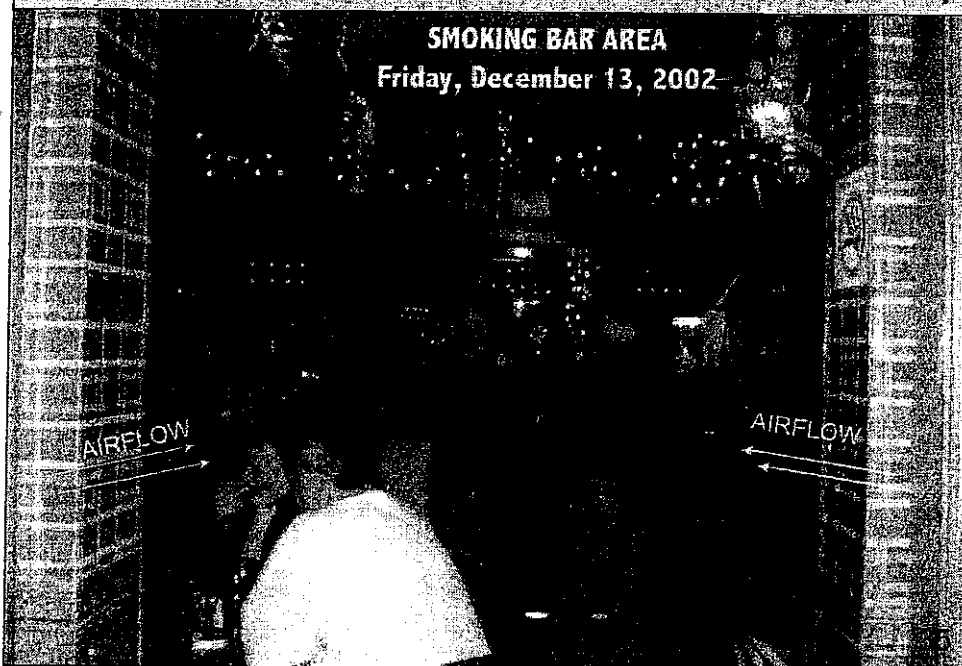
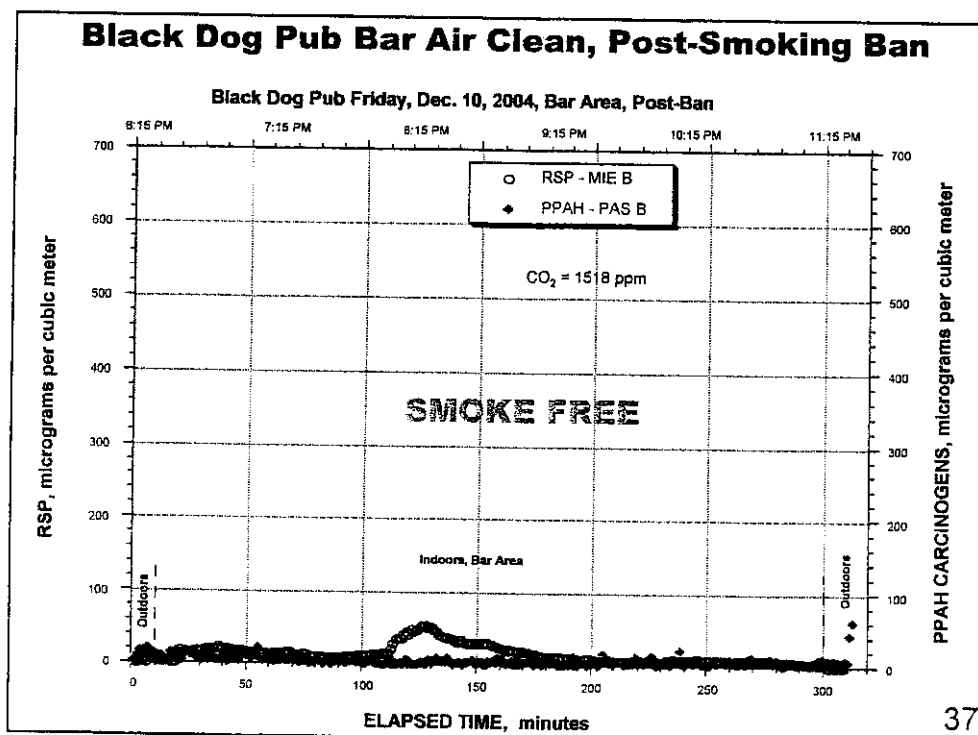
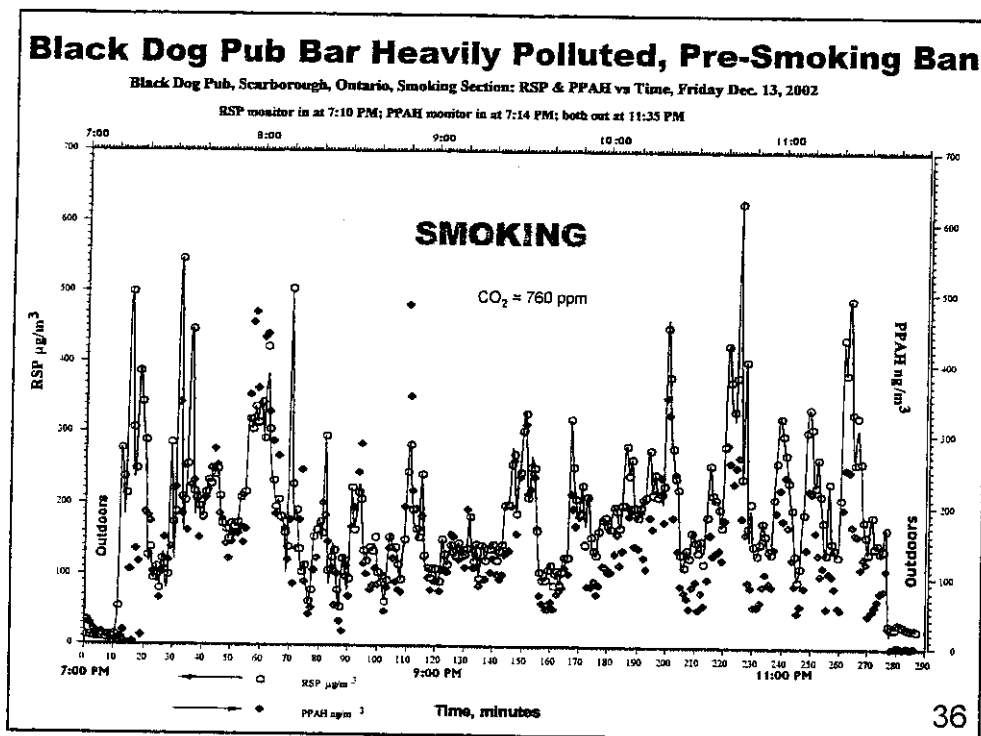


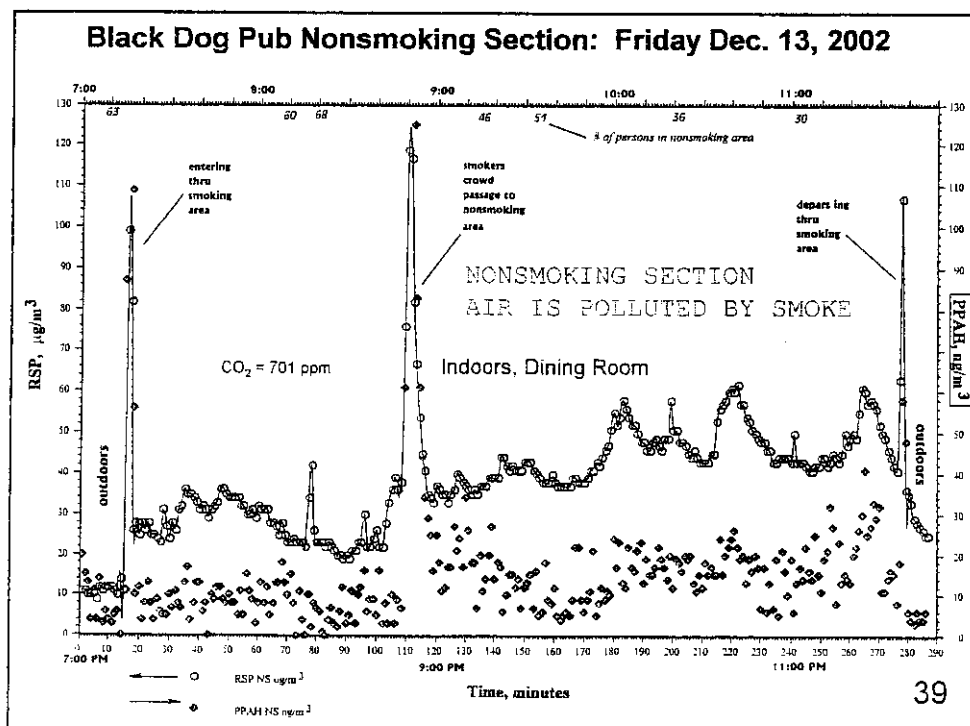
FIG. 1. Schematic diagram of layout of Black Dog Pub.

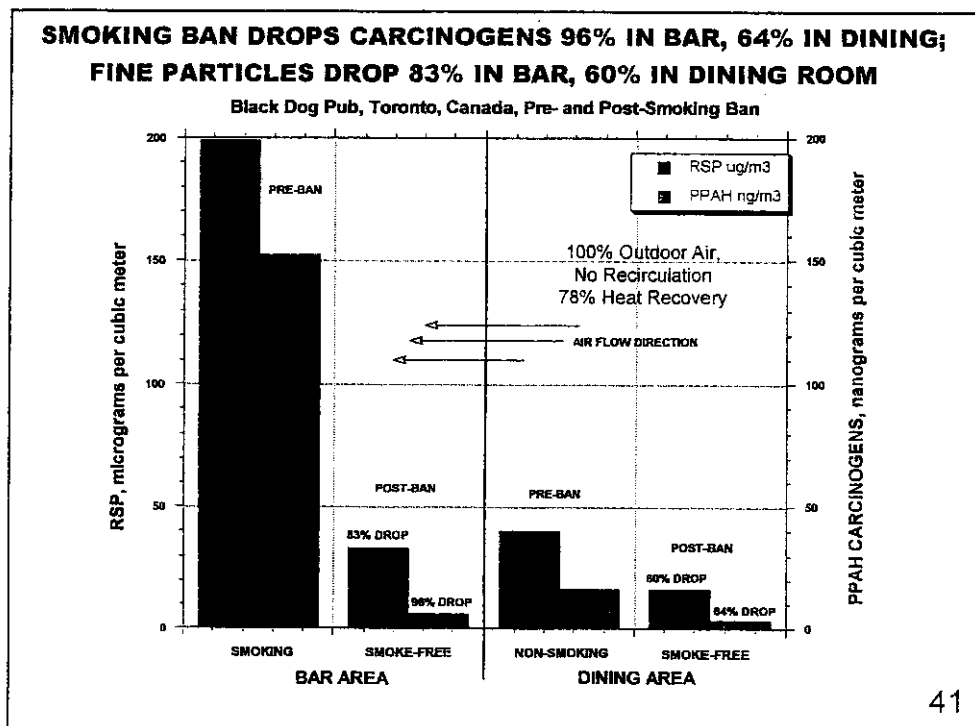
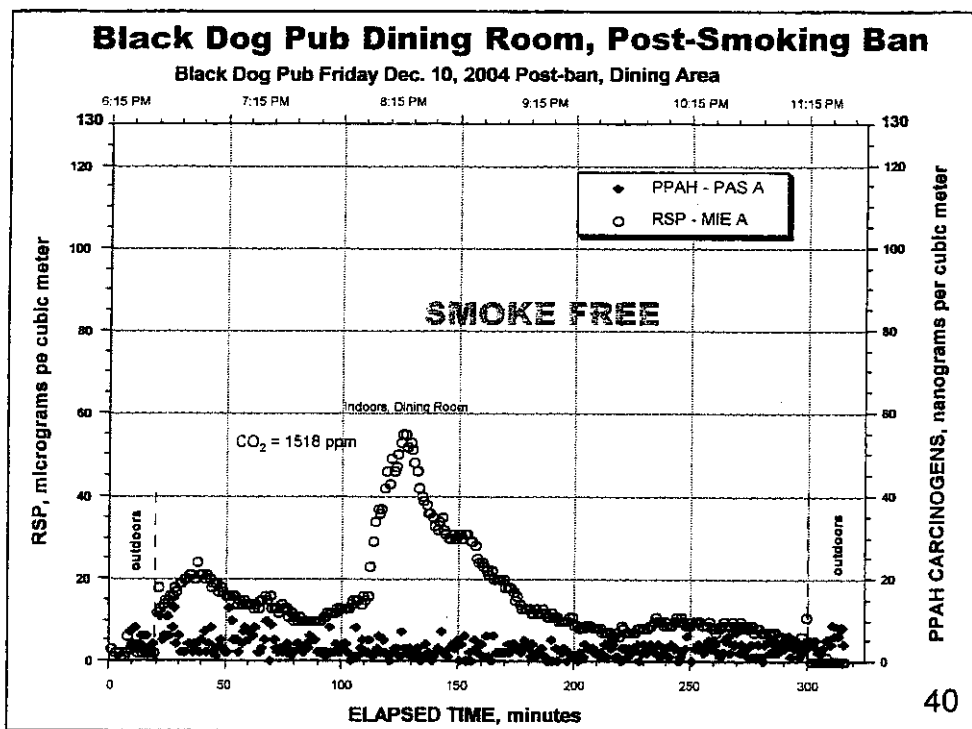
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THE BLACK DOG PUB RE-INVESTIGATED: REPACE (2005)









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ANANOVA™

FAILURE TO BAN SMOKING INJURES WORKERS' HEALTH

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Ananova:

Barmaid with cancer wins record passive smoking damages

An Australian barmaid who developed throat cancer from years of passive smoking has been awarded record damages of £164,000.

The landmark court decision in Australia has been applauded by anti-smoking groups.

Marlene Sharp, 62, sued the Port Kembla Returned and Services League Club, a military veterans' group, for negligence. She claimed her cancer was caused by breathing customers' tobacco smoke between 1984 and 1995.

A New South Wales state Supreme Court jury took just four hours to decide in Sharp's favour.

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Only Bans Eliminate Smoke Pollution



- Ventilation places workers at very high risk
- Air cleaning does not remove toxic & carcinogenic gases; is inferior to ventilation
- Smoking lounges expose workers & patrons to increased risk of cancer & heart disease
- Smoking lounges leak to nonsmoking areas
- Smoking bans reduce air pollution 90% to 95%, to outdoor background levels



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ENVIRONMENTAL TOBACCO SMOKE (ETS)

**POSITION DOCUMENT APPROVED BY ASHRAE
BOARD OF DIRECTORS, JUNE 30, 2005**

- **"AT PRESENT THE ONLY MEANS OF EFFECTIVELY ELIMINATING ETS IS TO BAN SMOKING ACTIVITY."**
- **"ADVERSE HEALTH EFFECTS FOR OCCUPANTS OF SMOKING ROOMS CANNOT BE CONTROLLED BY VENTILATION."**
- **"NO CURRENT AND ADVANCED DILUTION VENTILATION OR AIR CLEANING TECHNOLOGIES SHOULD BE RELIED UPON TO CONTROL HEALTH RISKS FROM ETS ..."**



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AMERICAN SOCIETY OF HEATING, REFRIGERATING & AIR CONDITIONING ENGINEERS