Secondhand Smoke and Legislating Clean Indoor Air

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Section A

SHS and the Health Effects of Passive Smoking
Definition of SHS and Passive Smoking

- **SHS**
  - Mixture of sidestream smoke released by the smoldering cigarette and the mainstream smoke that is exhaled by the smoke

- **Passive Smoking**
  - Inhalation of tobacco smoke by nonsmokers. Also referred to as involuntary smoking
SHS or ETS?

- Some Terminology
  - Active smoking
  - Passive smoking
  - Involuntary smoking

- SHS or ETS
  - SHS preferred
  - ETS originated with industry
Some Selected Contents of SHS

- **Irritants and Toxicants**
  - Ammonia, formaldehyde, carbon monoxide, nicotine, toluene, nitrogen dioxide, hydrogen cyanide, acrolein, acetaldehyde

- **Carcinogens**
  - Benzo[a]pyrene, 2-napthylamine, 4-aminobiphenyl, benzene, vinyl chloride, arsenic, chromium, polonium-210
Where SHS Exposure Occurs

- Homes, workplaces, transportation, public places
- Exposure varies with time-activity pattern
- Exposure in multiple locations adds up to total personal exposure
Personal Exposure to CO across a Day

CO and RSP Measured in a Smoky Bar/Restaurant

The 24-hour average time NHAPS respondents spent in each location

- Residential, indoors: 996 minutes
- Residential, outdoors: 156 minutes
- Mall/store: 119 minutes
- Near vehicle: 78 minutes
- In vehicle: 95 minutes
- Other, outdoor: 199 minutes
- School/public bldg.: 284 minutes
- Bar/restaurant: 112 minutes
- Other, indoor: 226 minutes

24-Hour Average Duration (minutes)

Exposure to SHS in Each Location

The 24-hour average time NHAPS respondents spent exposed to SHS in each location

- Other, indoor: 255 minutes
- Bar/restaurant: 143 minutes
- School/public bldg.: 249 minutes
- Mall/store: 198 minutes
- Office/factory: 363 minutes
- Other, outdoor: 247 minutes
- Near vehicle: 160 minutes
- In vehicle: 79 minutes
- Residential, outdoor: 178 minutes
- Residential, indoor: 305 minutes

24-Hour Average Duration (minutes)

The percentage of NHAPS respondents exposed to SHS in each location:

- Residential, indoors: 58.3%
- Residential, outdoors: 10.4%
- In vehicle: 33.1%
- Near vehicle: 10%
- Other, outdoor: 8.3%
- Office/factory: 9.9%
- Mall/store: 6.6%
- Bar/restaurant: 22.7%
- School/public bldg.: 5.8%
- Other, indoor: 6%

Section B

Health Effects of Passive Smoking
Health Effects of Passive Smoking

- SHS is tobacco smoke—tobacco smoke kills
  - Similar irritants, toxicants, and carcinogens found in SS and MS
  - No evidence of a threshold dose for health effects of active smoking, e.g., lung cancer
  - Biomarkers of tobacco smoke, such as cotinine, show that SHS is taken up by nonsmokers
  - Epidemiologic studies provide evidence that SHS causes diseases in children and adults
Initial epidemiological investigations reported in the late 1960s focused on parental smoking and illness in children.

- Scientific Evidence That SHS Kills

First major studies on lung cancer reported in 1981 from Japan and Greece

Hirayama T. 1990 Life-Style and Mortality: a Large-Scale Census-Based Cohort Study in Japan (Vol)6 (Contributions to Epidemiology and Biostatistics) Basel: Karger.


Notes: Hirayama. (1981); Trichopoulos et al. (1981).
BMJ Letters Concerning the Hirayama Study

- Misclassification
  - Active smoking
  - Passive smoking
- Confounding
- Statistical error
- Plausibility
“Error Invalidates Japanese Smoking Study, Experts Say”

“Independent statisticians have confirmed a fundamental arithmetical error which invalidates the claim in a widely publicized Japanese study that environmental cigarette smoke is associated with lung cancer in non-smokers.”

“One of the authorities who found the error is Professor Nathan Mantel of the George Washington University Biostatistics Center. He is co-author of the statistical test which was used in the Japanese study, and in which the arithmetical error occurred.”

1986 Surgeon General’s Report

Former U.S. Surgeon General
C. Everett Koop, M.D.

Source: 1986 Surgeon General’s Report
http://www.cdc.gov/tobacco/sgr/sgr_1986/
accessed 1/3/06

Photo source: http://profiles.nlm.nih.gov/QQ/B/B/D/M/
accessed 1/3/06
1986: Three Key Reports

- **Evaluation of the Carcinogenic Risk of Chemicals to Humans: Tobacco Smoking**
- **The Health Consequences of Involuntary Smoking**
- **Environmental Tobacco Smoke**


1992 EPA Risk Assessment


- Based on meta-analysis of 31 studies
- Extensively criticized by the tobacco industry
- Federal court decision around methods
- Policy implications key
“Involuntary smoking (exposure to second-hand or 'environmental’ tobacco smoke) is carcinogenic to humans.”

Image source: http://www.who.int/bookorders/anglais/detart1.jsp?sesslan=1&codlan=1&codcol=72&codcch=83# accessed 3/1/06
“The massive effort launched across the tobacco industry against one scientific study is remarkable.”

SHS and Controversy?

- Maintained controversy about SHS control
- Health effects
- Extent of exposure
- Control strategies
- Costs of control measures
“Parties recognize that scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease, and disability.”
Health Effects in Children

- Sudden infant death syndrome (SIDS)\(^1\)
- Acute respiratory illnesses\(^2\)
- Chronic respiratory symptoms\(^3\)
- Reduced lung function growth\(^4\)
- Asthma and exacerbation of asthma symptoms\(^5\)
- Acute and chronic middle ear disease\(^6\)

Source: 1. CALEPA/C; UK/A; WHO/C
2. SG ’84/A; SG’86/A; EPA/C; CALEPA/C; UK/C; WHO/C for increased prevalence or respiratory illnesses and SG ’84/A; SG’86/A; EPA/A; CALEPA/C; WHO/C for increased frequency of bronchitis and pneumonia
3. SG’86/A; WHO/C
4. SG ’84/A; SG’86/A; EPA/A; CALEPA/A; WHO/C
5. EPA/C; CALEPA/C; WHO/C for exacerbation and EPA/A; CALEPA/C for new cases
6. SG ’86/A; EPA/C; CALEPA/C; UK/A; WHO/C
Health Effects in Adults

- Established
  - Lung cancer\(^1\)
  - Cardiovascular disease\(^2\)

- Possible
  - Reduced lung function
  - Other cancers
  - Exacerbation of asthma\(^3\)
  - Respiratory symptoms\(^4\)

Source: 1. SG '86/C; EPA/C; CALEPA/C; UK/C; IARC/C
2. CALEPA/C; UK/C; WHO/A
3. CALEPA/C
4. SG '84/A
Is There a Safe Level of SHS?

- There is **no safe level** of SHS!

Warning: You don’t have to smoke to die from it. Second-hand smoke kills.
Section C

Controlling Passive Smoking
Reducing Exposure to SHS

- Control source
  - Reduce smoking
- Change the source
- Separate smokers and nonsmokers
- Increase ventilation
- Use air cleaning
The Mass-Balance Model

- Concentration of SHS depends on—
  - Strength of source
    - Number of smokers and smoking pattern
    - Emissions from cigarettes
  - Ventilation
    - Rate of exchange of outdoor with indoor air
  - Air cleaning
What Works?

- What works?
  - Elimination of the source

- What does not work?
  - Separation of smokers and nonsmokers in the same space
  - Ventilation
  - Air cleaning
“... our ultimate objective is to maintain the ability for our consumers to enjoy our products in public venues, such as restaurants, hotels, bowling centers, and shopping malls.”

- Philip Morris and the Hospitality Industry
“FOR IMMEDIATE RELEASE
JT to Accelerate Expansion of
“Reduced Odor Cigarette Segment”

Tokyo, October 6, 2003 --- Japan Tobacco Inc. (JT) (TSE:2914) announced today an initiative aimed at the “reduced odor cigarette segment” through the launch of “Mild Seven Prime Super Lights Box” (Mild Seven Prime/JPY 300 per pack) and a sales area expansion of “Lucia Citrus Fresh Menthol” (Lucia/JPY 300 per pack), starting November 4, 2003.

In its latest medium-term management plan, JT PLAN-V, JT stated that the company is creating a new category of cigarettes with reduced tobacco odors. The creation of this new segment is part of JT's commitment to allow smokers and non-smokers to more easily coexist.

Lucia is the first product in this category, launched in the Tokyo metropolitan area, in February of this year. Following its successful market entry in Tokyo, the brand’s sales area was expanded into the neighboring four prefectures in August. Since its launch, Lucia has maintained market share at levels almost twice as large as other newly marketed brands, and from November 4 onwards it will be available nationwide.”

- JT delight world

Source: http://www.jti.co.jp/JTI_E/Release/03/no28.html retrieved 3/2/06
ASHRAE Standard

Ventilation for acceptable indoor air quality

(American Society of Heating Refrigerating and Air Conditioning Engineers, Inc.)

“This standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of standard.”
Public places comprise a broad spectrum of enclosed areas to which the public is invited or in which the public is permitted, including but not limited to—

- Banks
- Educational facilities
- Health care facilities
- Public transportation
- Reception areas
- Restaurants
- Retail food/markets
- Shops/shopping malls
- Sport arenas
- Theaters
- Waiting rooms
Benefits of Controlling SHS

- **Short-term**
  - Reduction in respiratory effects
  - Evidence of reduction in heart attacks
  - Economic savings

- **Long-term**
  - Reduction in prevalence
  - Increase in cessation
  - Reduction in lung cancer
  - Changing societal norms
History of Effort to Protect Nonsmokers in U.S. From SHS

1970
- 1st report to review ETS effects (Jan. 1972)
- S.G. Jesse Steinfeld calls for non-smokers bill of rights (Jan. 1971)
- ICC restricts smoking to rear 20% of interstate buses

1975
- CAB requires smoking and nonsmoking seating on airlines (July 1973)
- MN passes 1st law requiring employees to protect nonsmokers (June 1975)

1980
- 1st epidemic studies published linking ETS w/lung cancer (Jan. 1981)
- 1st report to review ETS effects (Jan. 1972)
- S.G. Jesse Steinfeld calls for non-smokers bill of rights (Jan. 1971)
- ICC restricts smoking to rear 20% of interstate buses
- CAB requires smoking and nonsmoking seating on airlines (July 1973)

1985
- Congress imposes temporary ban aboard flight <2hrs. (1988)
- Congress eliminates smoking aboard commercial flights (Feb. 1991)
- NCI publishes airline study which shows those in nonsmoking sections significantly exposed to ETS (Feb. 1989)

1990
- NCI publishes airline study which shows those in nonsmoking sections significantly exposed to ETS (Feb. 1989)

1995
- CalEPA links ETS to CHD and SIDS deaths (1997)

2000
- EPA issues major report on ETS in adults and children (Jan. 1993)

### Airline Action to Restrict Smoking

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>U.S. Federal Aviation Commission outlaws smoking in airplane lavatories</td>
</tr>
<tr>
<td>1972</td>
<td>Introduction of separate smoking and nonsmoking sections</td>
</tr>
<tr>
<td>1987</td>
<td>Association of Flight Attendants endorses complete ban on smoking on commercial flights</td>
</tr>
</tbody>
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*Continued*
1987
Air Canada introduces first non-smoking flights

1988
Ban on smoking aboard U.S. domestic flights less than two hours

1992
ICAO resolves to eliminate smoking on international commercial flights by 1996
## Airline Action to Restrict Smoking

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<th>Year</th>
<th>Action</th>
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<td>1994</td>
<td>Some airlines have smoke-free international flights</td>
<td>Singapore Airlines, American Airlines, Cathay Pacific, British Airways, Virgin Atlantic, Delta, United</td>
</tr>
<tr>
<td>1998</td>
<td>Some airlines have bans on smoking on <strong>ALL</strong> flights</td>
<td>Finnair, Aer Lingus, British Airways, Lufthansa, SAS</td>
</tr>
<tr>
<td>2000</td>
<td>U.S. bans smoking on all domestic and international flights</td>
<td></td>
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</tbody>
</table>
“Many of the largest airports [in the U.S.] already restrict smoking to designated smoking lounges, but air inside these airports is still unhealthy, according to a recent study by the U.S. Centers for Disease Control and Prevention.

The CDC says these smoking lounges - even if they have separate ventilation systems - don't contain all smoke.

Many airports also lack regulations that keep smokers away from building entryways, creating an unhealthy zone that everyone coming and going must enter.”

Source: Airports urged to go totally smoke-free, by Matt Leingang Cincinnati Enquirer [02/25/05]
http://www.no-smoking.org/feb05/02-28-05-3.html accessed 3/2/06
Workers exposed to SHS on the job are **34% more likely to get lung cancer**

− Fontham et al. (1991)

International Labor Organization reported that cancer is the **number one killer in the workplace** and SHS is estimated to cause **2.8% of all worksite cancers**

− ILO. (2002)

Workplace smoking increases an employer’s potential legal liability

Nonsmoking employees have received settlements in cases based on their exposure to SHS

− Sweda. (1997)
Priority Interventions—Workplaces

- Effectively reduce SHS exposure
  - Percentage of workers reporting NO exposure to SHS rose from 19% to 54% one year after national smoke-free workplace legislation in Finland.

- Major impact on cessation and prevalence
  - Smoke-free workplaces are associated with a 29% reduction in cigarette consumption
    - Fichtenberg and Glantz. (2002)
Priority Interventions—Workplaces

- **Employee benefits**
  - Safer and healthier working environment
  - May benefit from cessation opportunities and support

- **Employer benefits**
  - Increased worker productivity
  - Reduced health care costs
  - Reduced maintenance costs
  - Reduction in the risk of fire
Change in Worker Protection from SHS

Notes: All estimates based on 1998–99 CPS data should be considered preliminary; 1986 data based on 18 years and older; all others—15 and older.
Data source: 1986 Adults Use of Tobacco Survey; all others—Current Population Study.
Change in Smoke-free Workplace Policy Coverage among Indoor American Workers by Type of Worker

Impact of Smoke-free Workplaces

- If all workplaces would become smoke-free, per capita consumption would drop by
  - 4.5 percent (U.S.)
  - 7.6 percent (U.K.)

- Achieving this type of reduction would require an increase from $0.76 to $3.05 and £3.44 to £6.59 per pack of cigarettes
  - Similar to tax increase to $1.11 and £4.26

“Smokers facing workplace restrictions have an 84 percent higher quit rate than average”

“Ten percent industry decline if smoking was banned in all workplaces”

“Anticipate a 74 percent increase in quitting rate if smoking was banned in all workplaces”

-Philip Morris

Impact of workplace restrictions on consumption and incidence
“Total prohibition in workplaces strongly affects industry volume.”

“Milder workplace restrictions, such as smoking only in designated areas, have much less impact on quitting rates and very little effect on consumption.”

-Philip Morris

Impact of workplace restrictions on consumption and incidence

Industry Challenges

Industry recognized by the early 1970s that clean indoor air restrictions would severely undermine their business

- "Smokers facing workplace restrictions have an 84 percent higher quit rate than average"

None of the major companies fully accepts the scientific evidence on SHS

Directly involved in activities aimed to undermine science

- Quote from WHO report on IARC

Directly counters attempts to legislate clean indoor air
What the tobacco industry is saying privately—

― “The immediate implication for our business is clear: if our consumers have fewer opportunities to enjoy our products, they will use them less frequently and the result will be an adverse effect on our bottom line.”¹

― “Smoking bans are the biggest challenge we have ever faced. Quit rate goes from 5% to 21% when smokers work in nonsmoking environments.”²

What the Tobacco Industry is Saying Privately—

“Those who say they work under [smoking] restrictions smoked about one-and-one quarter fewer cigarettes each day than those who don’t. That may sound light but remember we are talking about light restrictions, too. Those 220 people in our survey who work under smoking restrictions represent some 15 million Americans. That one-and-one quarter per day cigarette reduction, then, means nearly 7 billion fewer cigarettes smoked each year because of workplace smoking restrictions. . . .”

Source: Tobacco Institute internal document, Bates No. TIMN0014554/4565.
What the tobacco industry is saying privately—

“...At a dollar a pack, even the lightest workplace smoking restrictions is costing this industry 233 million dollars a year in revenue. How much more will it cost us with far more restrictive laws such as those in Suffolk County and Fort Collins now being enacted?”

Source: Tobacco Institute internal document, Bates No. TIMN0014554/4565.
Priority Interventions—Restaurants and Bars

- Highest levels of exposure
  - 160 to 200 percent higher than in smoking offices
- Nonsmoking areas are NOT effective in controlling exposure
- Smoke-free ordinances DO NOT result in lost business or negative impacts on local economies
What restaurateurs are saying—

— “We have had great business. Sales have gone up because of it. When the single-room restaurant allowed patrons to smoke, it went everywhere. There have been no complaints since the change.”¹

— “I haven’t had anybody complain about it since the ban. Even smokers say they don’t want to deal with secondhand smoke when they’re eating.”²

Reactions of Smokers to Smoking Bans in Restaurants

Reactions of European and American smokers to smoke-free ordinances in restaurants

- **Continued to eat out as frequently**
- **Eat out less frequently**
- **Stop eating out**

A survey done by Philip Morris Incorporated in 1989 demonstrated that European smokers were more accepting of smoke-free regulations than were Americans.

Data source: Minnesota Tobacco Litigation Depository (Bates No. 2500147496).
Smokers’ Beliefs About Where Smoking Should Be Banned

Percentage of adult respondents reporting that smoking should not be allowed at all in each venue

- U.S. minus CA '95-'96
- California '95-'96
- U.S. minus CA '98-'99
- California '98-'99

A large body of research—studies of more than 180 localities—shows that the passage of smoke-free ordinances has no effect on aggregate restaurant revenues.¹

“Taxes generated by the sale of food and beverages in the city are up 4.4 percent for the first nine months of this year compared to the same period last year. Food and beverage sales are up 5.8 percent over 2000, according to the city’s treasury division. Adjusted for inflation, the increases are about 2.8 percent and 1.6 percent, respectively.”²

A 1999 study of the effects of smoke-free ordinances in Wisconsin’s Dane County found “no support for the dire predictions of those who opposed the smoke-free ordinances.” The researchers controlled for economic factors that might influence the strong showing of the county’s restaurants. Some measures, they concluded, suggest that the legislation helped the county’s restaurant business.

Studies Show That Going Smoke-free Won’t Hurt Business

- A Massachusetts study found that 46% of nonsmoking adults avoid smoky places, primarily because they dislike the smell of smoke, have concerns about their health, and suffer physical symptoms (like eye and throat irritation). The researchers concluded that advertising a smoke-free environment is likely to attract patrons, especially health-conscious, well-educated nonsmokers.

Studies Show That Going Smoke-free Won’t Hurt Business

New York City after the ban. A success.

“Almost two years into cigarette ban, New York City bars thrive and many smokers shrug”
- The New York Times

“New York smoking ban proves a success, even among previously fiery opponents. Predicted economic hit never came, officials say.”
- The New York Times
Industry Reaction to Restaurant Smoking Restrictions

- Front Groups
  - Third-party allies in the hospitality industry
  - Act on tobacco industry’s behalf in opposing smoking control laws
  - Claim not to be allied with the industry but receive funding directly from the industry
  - Examples:
    - Hospitality Coalition on Indoor Air Quality
    - California Business and Restaurant Alliance
    - National Smokers Alliance
    - Beverly Hills Restaurant Association
“What if they passed a law that took away 30% of your business?”
- The Tobacco Institute

- The Tobacco Institute ran an ad in the hospitality trade press suggesting that business tanked after Beverly Hills went smoke-free in 1987
Priority Interventions—Hospitals

- Smoking is inconsistent with the health goals of medical institutions
- Protect patients and health staff
- Promotes lower prevalence and higher quit rates among employees, including doctors and nurses
- Improves ability to help patients quit smoking and provides strong role models

Image source: Institute for Global Tobacco Control
Governments lack authority to restrict smoking in homes—but other public interventions and health practitioners can—

- Educate smokers about the risks that their smoking poses to their families
- Encourage smokers to go outside to smoke
- Stress protection of the vulnerable—children, pregnant women, the elderly, and the ill
Challenges to Clean Indoor Air

- Political will
- Industry opposition
- Public acceptance and enforcement
Focus on priority areas
Gather community support
Know industry tactics and front groups
Overcoming Industry Challenges

- Reveal industry activities
- Publicly engage the industry
- Work at the local level
  "It’s barely controlled chaos [at the local level]. We can’t be everywhere at once."

Concluding Thoughts

- SHS is tobacco smoke—tobacco smoke kills!
- Prohibition of smoking, rigorously enforced, can eliminate exposure
- Exposure at home remains a challenge