

Tobacco Free Outdoors References and Sources

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Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence

Institute of Medicine. October 2009

Study results consistently indicate that exposure to secondhand smoke increases the risk of coronary heart disease by 25 to 30 percent.

Data consistently demonstrates that secondhand-smoke exposure increases the risk of coronary heart disease and heart attacks and that smoking bans reduce heart attacks.

For more information visit www.iom.edu/secondhandsmokeeffects

Cigarette Smoke Produces 10 Times More Air Pollution than Diesel Car Exhaust

Innovations Report. August 25, 2004

A turbo diesel 2 litre engine was started and left idling for 30 minutes in the garage, with the doors closed, after which the doors were left open for four hours. The car was fuelled with low sulphur fuel.

Three filter cigarettes were then lit up sequentially, and left smouldering for a further 30 minutes. The nicotine and tar content of each cigarette was 1 mg and 11.2 mg, respectively.

A portable analyser took readings every two minutes during the experiments. Combined particulate levels in the first hour after the engine had been started measured 88 ug/m³. Those recorded in the first hour after the cigarettes had been lit measured 830 ug/m³: 10 times greater.

The diesel engine exhaust doubled the particulate matter levels found outdoors at its peak; the environmental tobacco smoke particulate matter reached levels 15 times those measured outdoors.

http://www.innovations-report.com/html/reports/environment_sciences/report-32752.html
[9/29/2009 3:23:52 PM]

How Do Tobacco Smoke and Car Exhaust Compare?

Energy Independence Now Fact Sheet

www.einow.org • info@einow.org

Many of the known toxic compounds in tobacco smoke are also emitted from combustion of petroleum hydrocarbons, so there is significant overlap in the lists of compounds that have been identified in these mixtures to date. The key difference is that tobacco, being a biological product, contains much more nitrogen than does crude or refined petroleum, in which nitrogen is rare. Thus, tobacco and tobacco smoke contain several classes of nitrogen containing chemicals that are not present in petroleum fuels and their exhausts. Some of these are toxicologically important, associated with bladder cancer and other health effects. [These] carcinogenic nitrosamines derived from nicotine are a very important difference.

Particulate matter from tobacco versus diesel car exhaust: an educational perspective

Background: Air pollution is a common alibi used by adolescents taking up smoking and by smokers uncertain about quitting. However, environmental tobacco smoke (ETS) causes fine particulate matter (PM) indoor pollution exceeding outdoor limits, while new engines and fuels have reduced particulate emissions by cars. Data comparing PM emission from ETS and a recently released diesel car are presented.

Conclusions: ETS is a major source of PM pollution, contributing to indoor PM concentrations up to 10-fold those emitted from an idling ecodiesel engine. Besides its educational usefulness, this knowledge should also be considered from an ecological perspective.

Tobacco Control 2004;13:219-221; doi:10.1136/tc.2003.005975

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Why Smokers Struggle To Quit: New Findings

Just seeing someone smoke can trigger smokers to abandon their nascent efforts to kick the habit, according to new research conducted at Duke University Medical Center.

"Quitting smoking dramatically increased brain activity in response to seeing the smoking cues..." Our research shows us that when smokers encounter these cues after quitting, it activates the area of the brain responsible for automatic responses. That means quitting smoking may not be a matter of conscious control. So, if we're really going to help people quit, this emphasizes the need to do more than tell people to resist temptation. We also have to help them break that habitual response."

Duke University Medical Center (2009, January 7). Why Smokers Struggle To Quit: New Findings. *ScienceDaily*. Retrieved October 15, 2009, from <http://www.sciencedaily.com/releases/2009/01/090105175324.htm>

Real-Time Measurement of Outdoor Tobacco Smoke Particles

Neil E. Klepeis, Wayne R. Ott, and Paul Switzer, Stanford University, Stanford, CA
Journal of The Air and Waste Management Association (May 2007).

We monitored OTS levels during 15 on-site visits to 10 outdoor public places where active cigar and cigarette smokers were present, including parks, sidewalk cafés, and restaurant and pub patios. For three of the visits and during 4 additional days of monitoring outdoors and indoors at a private residence, we controlled smoking activity at precise distances from monitored positions. The overall average OTS respirable particle concentration for the surveys of public places during smoking was approximately 30 $\mu\text{g m}^{-3}$. OTS exhibited sharp spikes in particle mass concentration during smoking that sometimes exceeded 1000 $\mu\text{g m}^{-3}$ at distances within 0.5 m of the source. Some average concentrations over the duration of a cigarette and within 0.5 m exceeded 200 $\mu\text{g m}^{-3}$, with some average downwind levels exceeding 500 $\mu\text{g m}^{-3}$. OTS levels in a constant upwind direction from an active cigarette source were nearly zero. OTS levels also approached zero at distances greater than approximately 2 m from a single cigarette. During periods of active smoking, peak and average OTS levels near smokers rivaled indoor tobacco smoke concentrations. However, OTS levels dropped almost instantly after smoking activity ceased. Based on our results, it is possible for OTS to present a nuisance or hazard under certain conditions of wind and smoker proximity.

Exposure to secondhand tobacco smoke in outdoor settings a risk, study shows

Stanford Report, May 2, 2007

<http://news-service.stanford.edu/news/2007/may9/smoking-050907.html>

the Stanford team concluded that a nonsmoker sitting a few feet downwind from a smoldering cigarette is likely to be exposed to substantial levels of contaminated air for brief periods of time.

"Some folks have expressed the opinion that exposure to outdoor tobacco smoke is insignificant, because it dissipates quickly into the air," said Neil Klepeis, assistant professor (consulting) of civil and environmental engineering at Stanford and lead author of the study. "But our findings show that a person sitting or standing next to a smoker outdoors can breathe

in wisps of smoke that are many times more concentrated than normal background air pollution levels."

"We were surprised to discover that being within a few feet of a smoker outdoors may expose you to air pollution levels that are comparable, on average, to indoor levels that we measured in previous studies of homes and taverns," said Wayne Ott, professor (consulting) of civil and environmental engineering at Stanford and co-author of the JAWMA study. "For example, if you're at a sidewalk café, and you sit within 18 inches of a person who smokes two cigarettes over the course of an hour, your exposure to secondhand smoke could be the same as if you sat one hour inside a tavern with smokers. Based on our findings, a child in close proximity to adult smokers at a backyard party also could receive substantial exposure to secondhand smoke."

Each instrument was calibrated to measure an airborne pollutant known as particulate matter-2.5 (PM2.5), which consists of thousands of microscopic particles that are less than 2.5 micrometers in width—about 30 times narrower than a human hair.

"PM2.5 is a toxic pollutant produced by cigarettes, wood-burning stoves, diesel engines and other forms of combustion," Ott explained. "It contains benzo(a)pyrene, a carcinogen, and many other toxic chemicals that can penetrate deep inside the lungs."

According to the Environmental Protection Agency, exposure to PM2.5 can lead to serious health problems, including asthma attacks, chronic bronchitis, irregular heartbeat, nonfatal heart attacks and even premature death in people with heart or lung disease. The current EPA ambient air standard for PM2.5 is 35 micrograms per cubic meter of air averaged over 24 hours. Levels that exceed 35 micrograms are considered unhealthy. "However, since tobacco smoke contains many toxic components, including carcinogens, it may be even less healthy than typical ambient air pollution," Klepeis noted.

Outdoor tobacco smoke consists of brief plumes that sometimes exceed 1,000 micrograms, Klepeis added. "On the other hand, clean air typically contains less than 20 micrograms of PM2.5," he said. "Therefore, a person near an outdoor smoker might inhale a breath with 50 times more toxic material than in the surrounding unpolluted air."

Filtration

"In indoor workplaces where smoking is permitted, [secondhand smoke] can spread throughout the airspace of all workers. The most direct and effective method of eliminating ETS from the workplace is to prohibit smoking in the workplace."

The National Institute of Occupational Safety and Health (NIOSH)

"...general ventilation as delivered by heating, ventilation and air condition (HVAC) systems, is not an acceptable engineering control measure for controlling occupational exposures to [environmental tobacco smoke] ETS."

Department of Labor, Occupational Safety and Health Administration, Federal Register notice of proposed rulemaking, "Indoor Air Quality", FR 59:15968-16039, April 5, 1994
www.osha-slc.gov/FedReg_oseha_data/FED19940405.html

Third-Hand Smoke: Another Reason To Quit Smoking

<http://www.sciencedaily.com/releases/2008/12/081229105037.htm>

Particulate matter from tobacco smoke has been proven toxic. According to the National Toxicology Program, these 250 poisonous gases, chemicals, and metals include hydrogen cyanide, carbon monoxide, butane, ammonia, toluene (found in paint thinners), arsenic, lead, chromium (used to make steel), cadmium (used to make batteries), and polonium-210 (highly radioactive carcinogen). Eleven of the compounds are classified as Group 1 carcinogens, the most dangerous.

Small children are especially susceptible to third-hand smoke exposure because they can inhale near, crawl and play on, or touch and mouth contaminated surfaces. Third-hand smoke can remain indoors even long after the smoking has stopped. Similar to low-level lead exposure, low levels of tobacco particulates have been associated with cognitive deficits among children, and the higher the exposure level, the lower the reading score. These findings underscore the possibility that even extremely low levels of these compounds may be neurotoxic and, according to the researchers, justify restricting all smoking in indoor areas inhabited by children.

"The dangers of third-hand smoke are very real," says Winickoff, who is a professor of Pediatrics at Harvard Medical School and a member of the American Academy of Pediatrics' Richmond Center. "Our goal was to find out if people who were aware of these harmful effects were less likely to smoke inside of their home."

Perceptions of Second-hand Smoke Risks Predict Future Adolescent Smoking Initiation

This new paper shows that concern over secondhand smoke is a much more powerful motivator of smoking behavior than is peer smoking.

Perceptions of Second-hand Smoke Risks Predict Future Adolescent Smoking Initiation. Song AV, Glantz SA, Halpern-Felsher BL. University of California, Merced, School of Social Sciences, Humanities, and Arts, Psychological Sciences, Merced, California.

J Adolesc Health 2009 Dec;45(6):618-25. Epub 2009 Jun 28.

PURPOSE: To directly test whether perceptions of second-hand smoke risks deter adolescent smoking initiation.

METHODS: A longitudinal survey design was utilized in this study. Baseline surveys measuring perceptions of tobacco-related risks and smoking behaviors were administered to 395 high school students, with three follow-up assessments every 6 months.

RESULTS: Perceptions of personal second-hand smoke risks and parental second-hand smoke risks significantly deterred adolescent smoking initiation. Perceptions of personal second-hand smoke risks reduced the odds of smoking by a factor of 0.63 (95% confidence interval

[CI]=0.42-0.94) for each quartile increase in perceptions of personal second-hand smoke risks. Adolescents who provided the highest estimates of risks for personal second-hand smoke were 0.25 as likely to smoke as adolescents who provided the lowest estimates of risk. Perceptions of parental second-hand smoke risks reduced the odds of smoking by a factor of 0.64 (95% CI=0.43-0.93) for each quartile increase. Adolescents who perceived the highest estimates of risks associated with parental second-hand smoke were 0.26 as likely to smoke in the future compared to adolescents who provided the lowest estimates of risk. These effects are over three times as large as a smoking peer's influence on a nonsmoking adolescents' risk for smoking initiation, odds ratio [OR]=1.18 (95% CI=1.02-1.35).

CONCLUSIONS: Adolescent perceptions of risks of second-hand smoke are strongly associated with smoking initiation. Encouraging adolescents to express their objections to second-hand smoke, as well as encouraging parents to create smoke-free homes, may be powerful tobacco control strategies against adolescent smoking.

The full paper is at <http://www.ncbi.nlm.nih.gov/pubmed/19931835>

Perceptions of smoking-related risks and benefits as predictors of adolescent smoking initiation.

Am J Public Health. 2009 Mar;99(3):487-92. Epub 2008 Dec 23.

Song AV, Morrell HE, Cornell JL, Ramos ME, Biehl M, Kropp RY, Halpern-Felsher BL.

Center for Tobacco Control Research and Education, University of California, San Francisco, CA 94118, USA.

OBJECTIVES: The predictive value of perceptions of smoking-related risks and benefits with regard to adolescent smoking initiation has not been adequately established. We used prospective, longitudinal data to directly test whether smoking-related perceptions predict smoking initiation among adolescents.

METHODS: We administered surveys assessing perceptions of smoking-related risks and benefits to 395 high school students, beginning at the start of their ninth-grade year. We conducted follow-up assessments every 6 months until the end of 10th grade, obtaining 4 waves of data.

RESULTS: Adolescents who held the lowest perceptions of long-term smoking-related risks were 3.64 times more likely to start smoking than were adolescents who held the highest perceptions of risk. Adolescents who held the lowest perceptions of short-term smoking-related risks were 2.68 times more likely to initiate. Adolescents who held the highest perceptions of smoking-related benefits were 3.31 times more likely to initiate.

CONCLUSIONS: Findings from this study provide one of the first sets of empirical evidence to show that smoking initiation is directly related to smoking-related perceptions of risks and benefits. Thus, efforts to reduce adolescent smoking should continue to communicate the health risks of smoking and counteract perceptions of benefits associated with smoking.

Other stuff:

- Calabasas, CA, a smoke-free city <http://www.cityofcalabasas.com/secondhandsmoke.html>
- Ith Common Council Planning Committee Agenda with current draft of ordinance <http://bit.ly/d01fYE>
- Ithaca Times: How about a ban on legislating morality? <http://bit.ly/dbNMr3>

Whereas...*Family Smoking Prevention and Tobacco Control Act*

(33) Tobacco dependence is a chronic disease, one that typically requires repeated interventions to achieve long-term or permanent abstinence.

(34) Because the only known safe alternative to smoking is cessation, interventions should target all smokers to help them quit completely.

School of Medicine extends smoking ban to outdoor zones

Stanford Report, August 22, 2007

“A lot of people might assume that the smoke is very dilute and just floats away immediately. But if you are downwind of one or two smokers while sitting at a table or bench, you could be exposed as much as if you were in a smoky bar,” said Neil Klepeis, PhD, assistant professor (consulting) of civil and environmental engineering and lead author of the study. The study was published in the *Journal of the Air and Waste Management Association*.

Even brief exposures to this kind of secondhand smoke can have immediate adverse effects on the heart and respiratory system and can increase the frequency of asthma attacks, especially in children, according to a 2006 report from the U.S. Surgeon General.

City of Watertown, N.Y.

WHEREAS the City believes that tobacco use in the proximity of children and adults while watching outdoor recreational activities at City owned and operated playgrounds is detrimental to their health and can be offensive to those using such facilities; and

WHEREAS the City has a unique opportunity to create and sustain an environment that supports a smoke free norm through a non-smoking policy and adult peer role modeling on City-owned playgrounds; and

WHEREAS the City believes parents, leaders, and officials involved in recreation are role models for youth and can have a positive effect on the lifestyle choices they make; and

WHEREAS cigarettes, once consumed in public places, are often discarded on the ground requiring additional maintenance expenses, diminish the beauty of the City’s recreational facilities, and pose a risk to toddlers due to ingestion; and

WHEREAS the City of Watertown determines that the prohibition of smoking at the City’s recreational playgrounds serves to protect the health, safety and welfare of the citizens of our community;

WHEREAS the City owned playgrounds listed below will be deemed smoke free as well as any future City owned playgrounds:

Commentary: How acute and reversible are the cardiovascular risks of secondhand smoke?

Terry F Pechacek, Stephen Babb. BMJ VOLUME 328 24 APRIL 2004 bmj.com Downloaded from bmj.com on 27 November 2007

Exposure to secondhand smoke increases the risk of fatal and non-fatal coronary heart disease in non-smokers by about 30%.

Even small exposures to tobacco smoke rapidly increase the risk

A substantial body of epidemiological and laboratory data indicates that, unlike the case with lung cancer, the risk of acute myocardial infarction and coronary heart disease associated with exposure to tobacco smoke is non-linear at low doses, increasing rapidly with relatively small doses such as those received from secondhand smoke or actively smoking one or two cigarettes a day.

Consistent with the epidemiological findings both for active smoking at lower numbers of cigarettes a day and for exposure to secondhand smoke, laboratory data suggest that even small exposures significantly and rapidly increase platelet aggregation and induce other arterial and haemodynamic changes. An acute myocardial infarction is commonly precipitated by the activation and aggregation of platelets and the resulting formation of a thrombus or clot that obstructs the arterial blood supply to part of the heart.

Highlights

HEART RISKS

Study results consistently indicate that exposure to secondhand smoke increases the risk of coronary heart disease by 25 to 30 percent. (Institute of Medicine, Oct 2009)

ETS VS DIESEL

ETS is a major source of PM pollution, contributing to indoor PM concentrations up to 10-fold those emitted from an idling ecodiesel engine. Besides its educational usefulness, this knowledge should also be considered from an ecological perspective.

Tobacco Control 2004;13:219-221; doi:10.1136/tc.2003.005975

The diesel engine exhaust doubled the particulate matter levels found outdoors at its peak; the environmental tobacco smoke particulate matter reached levels 15 times those measured outdoors.

VISUAL IMPACT

Just seeing someone smoke can trigger smokers to abandon their nascent efforts to kick the habit, according to new research conducted at Duke University Medical Center. So, if we're really going to help people quit, this emphasizes the need to do more than tell people to resist temptation. Duke University Medical Center (2009, January 7).

OTS

"But our findings show that a person sitting or standing next to a smoker outdoors can breathe in wisps of smoke that are many times more concentrated than normal background air pollution levels."

"Therefore, a person near an outdoor smoker might inhale a breath with 50 times more toxic material than in the surrounding unpolluted air." During periods of active smoking, peak and average OTS levels near smokers rivaled indoor tobacco smoke concentrations. Based on our findings, a child in close proximity to adult smokers at a backyard party also could receive substantial exposure to secondhand smoke."

Outdoor tobacco smoke consists of brief plumes that sometimes exceed 1,000 micrograms, Klepeis added. "On the other hand, clean air typically contains less than 20 micrograms of PM2.5," he said. "Therefore, a person near an outdoor smoker might inhale a breath with 50 times more toxic material than in the surrounding unpolluted air."

According to the Environmental Protection Agency, exposure to PM2.5 can lead to serious health problems, including asthma attacks, chronic bronchitis, irregular heartbeat, nonfatal heart attacks and even premature death in people with heart or lung disease. Stanford study (2007).

Journal of The Air and Waste Management Association (May 2007).

THIRD HAND SMOKE

Small children are especially susceptible to third-hand smoke exposure because they can inhale near, crawl and play on, or touch and mouth contaminated surfaces. Third-hand smoke can remain indoors even long after the smoking has stopped. Similar to low-level lead exposure, low levels of tobacco particulates have been associated with cognitive deficits among children, and the higher the exposure level, the lower the reading score. These findings underscore the possibility that even extremely low levels of these compounds may be neurotoxic and, according to the researchers, justify restricting all smoking in indoor areas inhabited by children.

PERCEPTIONS OF SECOND-HAND SMOKE RISKS PREDICT FUTURE ADOLESCENT SMOKING INITIATION

This new paper shows that concern over secondhand smoke is a much more powerful motivator of smoking behavior than is peer smoking. Perceptions of personal second-hand smoke risks and parental second-hand smoke risks significantly deterred adolescent smoking initiation. Adolescents who provided the highest estimates of risks for personal second-hand smoke were 0.25 as likely to smoke as adolescents who provided the lowest estimates of risk. Perceptions of parental second-hand smoke risks reduced the odds of smoking by a factor of 0.64 (95% CI=0.43-0.93) for each quartile increase. Adolescents who perceived the highest estimates of risks associated with parental second-hand smoke were 0.26 as likely to smoke in the future compared to adolescents who provided the lowest estimates of risk. Encouraging adolescents to express their objections to second-hand smoke, as well as encouraging parents to create smoke-free homes, may be powerful tobacco control strategies against adolescent smoking. *J Adolesc Health* 2009 Dec

According to the U.S. Surgeon General, there is no safe level of exposure to secondhand smoke.

Air near an outdoor smoker can be 50-times more toxic than surrounding air.

Tobacco smoke is more harmful than exhaust from a modern diesel engine.

Even small amounts of secondhand smoke can cause a heart attack.

Even brief exposure to secondhand smoke can cause asthma attacks.

Youth who are aware there are risks from exposure to secondhand smoke are less likely to try smoking.

“Third-hand smoke” — residue that sticks to clothing & surfaces — is highly toxic to children.