HEALTH HARMS FROM SECONDHAND SMOKE

The scientific evidence on the health risks associated with exposure to secondhand smoke is clear, convincing, and overwhelming. Secondhand smoke (also referred to as involuntary smoking, environmental tobacco smoke, and passive smoking) is a known cause of lung cancer, heart disease, low birth-weight births, and chronic lung ailments such as bronchitis (particularly in children), as well as other health problems. According to the Centers For Disease Control and Prevention (CDC), nearly 50,000 Americans die each year from lung cancer and heart disease attributable to secondhand smoke exposure.[1]

Health risks associated with exposure to secondhand smoke

- *U.S. Surgeon General* (2006) – In the report, *The Health Consequences of Involuntary Exposure to Tobacco Smoke*, the Surgeon General concluded that:

  - "Secondhand smoke exposure causes disease and premature death in children and adults who do not smoke.
  - Children exposed to secondhand smoke are at an increased risk for sudden infant death syndrome (SIDS), acute respiratory infections, ear problems, and more severe asthma. Smoking by parents causes respiratory symptoms and slows lung growth in their children.
  - Exposure of adults to secondhand smoke has immediate adverse effects on the cardiovascular system and causes coronary heart disease and lung cancer.
  - The scientific evidence indicates that there is no risk-free level of exposure to secondhand smoke."[2]

- *Institute of Medicine (2009)* – In a landmark report, *Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence*, the Institute of Medicine (IOM) concludes smoke-free laws reduce the number of heart attacks and save lives. The report also confirms that there is conclusive scientific evidence that secondhand smoke causes heart disease, including heart attacks.

  The IOM report was requested by the Centers for Disease Control and Prevention (CDC) in the wake of a growing number of studies in smoke-free localities, states and countries that found reductions in heart attack rates after smoke-free laws are implemented. After a thorough review of the evidence, an IOM committee of scientific experts reached the following conclusions:

  - "The committee concludes that there is a causal relationship between smoking bans and decreases in acute coronary events."

  - "The evidence reviewed by the committee is consistent with a causal relationship between secondhand-smoke exposure and acute coronary events, such as acute MI (myocardial infarction)."

  - "The committee concludes that it is biologically plausible for a relatively brief exposure to secondhand smoke to precipitate an acute coronary event." According to the report, experimental studies have found that secondhand smoke exposure causes adverse changes in the cardiovascular system that increase the risk of a heart attack.[3]

- The Centers For Disease Control and Prevention also stated that studies conducted in several communities, states, and countries have found that implementing smoke-free laws is associated with reductions in hospital heart attack admissions. The CDC notes that, "smoke-free laws likely reduce

heart attack hospitalizations both by reducing secondhand smoke exposure among nonsmokers and by reducing smoking, with the first factor making the larger contribution."[4] Based on earlier evidence, experts at the U.S. Centers for Disease Control and Prevention had previously noted to all clinicians with patients who have a history of coronary heart disease that those patients "should be advised to avoid all indoor environments that permit smoking."[5]

- *World Health Organization* (2007) – In its report, *Protection From Exposure To Secondhand Tobacco Smoke – Policy Recommendations*, the World Health Organization stated that, "Scientific evidence has firmly established that there is no safe level of exposure to second-hand tobacco smoke (SHS), a pollutant that causes serious illness in adults and children. There is also indisputable evidence that implementing 100% smoke-free environments is the only effective way to protect the population from the harmful effects of exposure to SHS."[6]

- *California Environmental Protection Agency* (2005) – In its report, *Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant*, the California Environmental Protection Agency (CalEPA) recommended, based on their latest, comprehensive review of the scientific literature, that secondhand smoke be declared a toxic air contaminant and therefore be subject to emissions control regulations to be promulgated by the State of California. In this report, CalEPA reiterated and strengthened many of its previous findings regarding the harms associated with exposure to secondhand smoke, including the harmful effects on children, such as sudden infant death syndrome, induction and exacerbation of asthma, increased respiratory tract infections, increased middle ear infections, developmental toxicity resulting in lower birth weight, and impaired lung function. For adults, CalEPA reiterated and strengthened its prior findings for adults including lung cancer and heart disease. The new report also included two significant, new findings including their conclusion that exposure to secondhand smoke causes nasal sinus cancer and that it causes breast cancer in younger, primarily premenopausal women.[7]

- *International Agency for Research on Cancer* (June 2002) – According to the IARC, "involuntary smoking (exposure to secondhand or 'environmental' tobacco smoke) is carcinogenic to humans (Group 1*)*."[8] Further, the IARC concluded that there is a "statistically significant and consistent association between lung cancer risk in spouses of smokers and exposure to secondhand tobacco smoke from the spouse who smokes. The excess risk is on the order of 20% for women and 30% for men."

  In addition, the IARC found that "epidemiological studies have demonstrated that exposure to secondhand tobacco smoke is causally associated with coronary heart disease" and they estimated that "involuntary smoking increases the risk of an acute coronary heart disease event by 25-35%." Further, the IARC noted that, for adults, "the strongest evidence for a causal relation exists for chronic respiratory symptoms."

- In 2000, the *American College of Occupational and Environmental Medicine* issued the following summary of current knowledge on health harms from workplace exposure to secondhand smoke:

  > "Environmental tobacco smoke (ETS) contains numerous toxins. Robust epidemiologic evidence implicates ETS as a cause of lung cancer and as a primary cause and a source of exacerbation of excess respiratory disease. There is also increasing evidence that ETS may be associated with other outcomes, including heart disease. There is currently little doubt that ETS is an important and avoidable health hazard. Unfortunately, ETS is frequently encountered in the workplace - where it is no safer than in other environments and where it presents hazards to exposed workers and others."[9]

- In January 2005, the U.S. Public Health Service's National Toxicology Program issued its *11th Report on Carcinogens*, which unambiguously states, based on a thorough review of the available scientific and medical evidence, that:

> "Environmental tobacco smoke is *known to be a human carcinogen* based on sufficient evidence of carcinogenicity from studies in humans that indicate a causal relationship between passive exposure to tobacco smoke and human lung cancer. Some studies also support an association of environmental tobacco smoke with cancers of the nasal sinus (CEPA 1997). Evidence for an increased cancer risk from environmental tobacco smoke stems from studies examining nonsmoking spouses living with individuals who smoke cigarettes, exposures of nonsmokers to environmental tobacco smoke in occupational settings, and exposure to parents' smoking during childhood (IARC 1986, EPA 1992, CEPA 1997). Many epidemiological studies, including large population-based case-control studies, have demonstrated increased risks for developing lung cancer following prolonged exposure to environmental tobacco smoke. A meta-analysis found an overall increase in risk of 20% for exposure to environmental tobacco smoke from a spouse who smokes. Exposure to environmental tobacco smoke from spousal smoking or exposure in an occupational setting appears most strongly related to increased risk." [10]

- A 2004 study published in the *British Medical Journal* found that exposure to secondhand smoke increases the risk of heart disease among non-smokers by as much as 60 percent.[11] This is the first study to show a direct physical link between secondhand smoke exposure and an increased risk of heart disease. The study, conducted over 20 years by researchers at St. George's Hospital Medical School in London, measured exposure to secondhand smoke from all sources – including in bars, restaurants, and other workplaces, as well as in the home – based on blood levels of a nicotine byproduct called cotinine. The study is one of the few that has sought to account for all sources of exposure to secondhand smoke, not just home exposure.

- A 1997 analysis of 37 epidemiological studies of lung cancer and secondhand smoke, published in the *Journal of the National Cancer Institute,* found that lifelong nonsmokers living with smokers had, on average, a 24 percent higher chance of contracting lung cancer than those living with nonsmokers, and that those exposed to the heaviest smokers for the longest time had the highest risks.[12] Subsequent research studies have made similar findings.[13]

- A June 2001 study published in the journal *Pediatrics* found that exposure to secondhand smoke through the mother in utero was associated with increased rates of hospitalization in infants with non-smoking mothers, and that use of tobacco products by household members has an "enormous adverse impact" on the health of children.[14]

- Numerous research studies in the United States and overseas have found that smoking and exposure to secondhand smoke among pregnant women is a major cause of spontaneous abortions, stillbirths, and sudden infant death syndrome (SIDS) after birth.[15]

Campaign for Tobacco-Free Kids, October 15, 2009

Related Campaign Fact Sheets
All Secondhand Smoke factsheets are available at
http://tobaccofreekids.org/research/factsheets/index.php?CategoryID=19

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[1] CDC, "Annual Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses -- United States 2000-2004," *MMWR* 57(45), November 14, 2008 http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a3.htm. See also, California EPA, *Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant*, June 24, 2005.

[2] U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.

[3] IOM (Institute of Medicine). *Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence*. Washington, DC: The National Academies Press. 2009. http://www.iom.edu/Reports/2009/Secondhand-Smoke-Exposure-and-Cardiovascular-Effects-Making-Sense-of-the-Evidence.aspx

[4] U.S. Centers for Disease Control and Prevention, "Reduced Hospitalizations for Acute Myocardial Infarction After Implementation of a Smoke-Free Ordinance—City of Pueblo, Colorado, 2002–2006," *Morbidity and Mortality Weekly Report (MMWR)* 57 (51), January 2, 2009. http://www.cdc.gov/tobacco/data_statistics/mmwrs/byyear/2009/mm5751a1/highlights.htm.

[5] Pechacek TP, Babb S, "Commentary: How acute and reversible are the cardiovascular risks of secondhand smoke?," *British Medical Journal*, Volume 328, April 24, 2004.

[6] World Health Organization, "*Protection From Exposure To Secondhand Tobacco Smoke – Policy Recommendations,"* 2007. http://www.who.int/tobacco/resources/publications/wntd/2007/PR_on_SHS.pdf

[7] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant, June 24, 2005.

[8] International Agency for Research on Cancer, *Volume 83: Tobacco Smoke and Involuntary Smoking Summary of Data Reported and Evaluation, June 2002*, http://www.iarc.fr.

[9] American College of Occupational & Environmental Medicine, *Epidemiological Basis for an Occupational and Environmental Policy on Environmental Tobacco Smoke*, www.acoem.org/paprguid/papers/etspaper.htm, July 30, 2000.

[10] National Toxicology Program, Public Health Service, U.S. Department of Health and Human Services (HHS), *Report on Carcinogens, Eleventh Edition,* January 2005, http://ntp.niehs.nih.gov/ntp/roc/eleventh/profiles/s176toba.pdf

[11] Whincup, PH et al, "Passive smoking and risk of coronary heart disease and stroke: prospective study with cotinine measurement," *British Medical Journal*, BMJ, doi:10.1136/bmj.38146.427188.55, June 30, 2004, http://bmj.bmjjournals.com/cgi/reprint/bmj.38146.427188.55v1.

[12] Hackshaw, AK et al, "The Accumulated Evidence on Lung Cancer and Environmental Tobacco Smoke," *British Medical Journal* vol. 315 980-988, October 18, 1997.

[13] Boffetta, P, et al., "Multicenter Case-Control Study of Exposure to Environmental Tobacco Smoke and Lung Cancer in Europe," *Journal of the National Cancer Institute* 90: 1440-50, October 7, 1998. See, also, NCI, *Health Effects of Exposure to Environmental Tobacco Smoke: The Report of the California Environmental Protection Agency*, 1999, http://cancercontrol.cancer.gov/tcrb/nci_monographs/MONO10/MONO10.HTM.

[14] Lam, Tai-Hing, et al, "The Effects of Environmental Tobacco Smoke on Health Services Utilization in the First Eighteen Months of Life," *Pediatrics* 107(6), June 2001. See, also, Anderson, HR & DG Cook, "Passive Smoking and Sudden Infant Death Syndrome: Review of the Epidemiological Evidence," *Thorax* 52: 1003-1009, November, 1997.

[15] See, e.g., Shiverick, K.T. & C. Salafia, "Cigarette Smoking and Pregnancy I: Ovarian, Uterine and Placental Effects," *Placenta* 20(4): 265-272, May 1999; Ness, R. B., et al., "Cocaine and Tobacco Use and the Risk of Spontaneous Abortion," *New England Journal of Medicine* 340(5): 333-339, February 4, 1999; Chatenoud, L., et al., "Paternal and Maternal Smoking Habits Before Conception and During the First Trimester: Relation to Spontaneous Abortions," *Annals of Epidemiology* 8(8): 520-26, November 1998; Kline, J., et al., "Smoking: A Risk Factor for Spontaneous Abortions," *New England Journal of Medicine* 291(15): 793-96, October 1977; Raymond, E.G. et al., "Effects of Maternal Age, Parity, and Smoking on the Risk of Stillbirth," *British Journal of Obstetric Gynaecology* 101(4): 301-306, April 1994; Ahlborg, G. Jr. & L.. Bodin, "Tobacco Smoke Exposure and Pregnancy Outcome Among Working Women: A Prospective Study At Prenatal Care Centers In Orebro County, Sweden," *American Journal of Epidemiology* 133(4): 338-347; February 1991; Cooke, R.W., "Smoking, Intra-Uterine Growth Retardation and Sudden Infant Death Syndrome," *International Journal of Epidemiology* 27(2): 238-41 (April 1998). See, also, Campaign for Tobacco-Free Kids, *Harm Caused by Pregnant Women Smoking or Being Exposed to Secondhand Smoke*, http://tobaccofreekids.org/research/factsheets/pdf/0007.pdf.