

THE EMPEROR HAS NO CLOTHES: THE TRUTH ABOUT SECONDHAND SMOKE

Exposure to secondhand smoke (SHS) is an unpleasant experience for many nonsmokers and for decades was considered merely a nuisance. The idea that it might actually cause disease in nonsmokers has been around since the 1970s, and recent surveys show that more than 80% of Americans now believe it is harmful to nonsmokers.^{1,2}

The 1972 Surgeon General's report first addressed passive smoking as a possible threat to non-smokers and called for an anti-smoking movement.³ The problem was addressed again in the 1979, 1982, and 1984 Surgeon General's Reports. The 1986 Report concluded that involuntary smoking caused lung cancer but offered only weak epidemiological evidence to support the claim.⁴ So in 1989, the Environmental Protection Agency (EPA) was charged with further evaluating the evidence for health effects of SHS.

Three years later, in 1992, EPA published its report, "Respiratory Health Effects of Passive Smoking," which claimed that SHS is a serious public-health problem, that it kills approximately 3,000 nonsmoking Americans each year from lung cancer, and that it is a Group A carcinogen (similar to benzene, asbestos, and radon).⁵ The report has been used by the tobacco-control movement and government agencies, including public-health departments, to justify the imposition of thousands of indoor smoking bans in public places. But the report's conclusions are not supported by reliable scientific evidence. It has been largely discredited and, in 1998, was legally vacated by a federal judge. Even so, it was cited in the Surgeon General's 2006 report on SHS, where then-Surgeon General Richard Carmona made the absurd claim that there is no risk-free level of exposure to SHS.⁶

With its 1992 report, the EPA arbitrarily chose to equate SHS with mainstream (or firsthand) smoke. One of the agency's stated assumptions was that because there is an association between active smoking and lung cancer, there also must be a similar association between SHS and lung cancer. But SHS is not a single entity that can be measured or even precisely defined. Documenting actual exposure has never been possible. That's why only indirect estimates have been used—primarily, exposure to spousal smoking. And, after hundreds of millions of dollars of research over more than two decades, no specific carcinogen in smoke has ever been established as the causal agent.

In addition, the problem posed by SHS is entirely different from that found with mainstream smoke. A well recognized toxicological principle is, "the dose makes the poison." We physicians record direct exposure to cigarette smoke by smokers in the medical record as 'pack-years smoked' (packs smoked per day times the number of years smoked). A smoking history of around ten pack-years alerts the physician to search for cigarette-caused illness. But even those nonsmokers with the greatest exposure to SHS probably inhale the equivalent of only a small fraction (around 0.03) of one cigarette per day, which is equivalent to smoking around 10 cigarettes *per year*.^{7,8}

Another major problem is that the epidemiological studies on which the EPA report is based are statistical studies that can only show correlation but cannot prove causation. One statistical method used to compare the rates of a disease in two populations is relative risk (RR). It is the rate of disease found in the exposed population

divided by the rate found in the unexposed population. A RR of 1.0 represents zero increased risk. Because confounding and other factors can obscure a weak association, in order to *suggest* causation a very strong association must be found, on the order of at least 300% to 400%, which is a RR of 3.0 to 4.0.⁹ For example, the studies that linked direct cigarette smoking with lung cancer found an incidence in smokers of twenty to around forty times that in non-smokers (an association of around 2000% to 4000%, or a RR of around 20.0 to 40.0).¹⁰

An even greater problem is the agency's lowering of the confidence interval (CI) used in its report. Epidemiologists calculate confidence intervals to express the likelihood that a result could happen just by chance. A CI of 95% allows a 5% possibility that the results occurred only by chance. Before its 1992 report, the EPA had always used epidemiology's gold standard CI of 95% to measure statistical significance. But because the US studies that were chosen for the report weren't statistically significant with a 95% CI, for the first time in its history the EPA changed the rules and used a 90% CI, which doubled the chance of being wrong. This allowed it to report a statistically significant 19% increase of lung cancer cases in non-smoking spouses of smokers over those cases found in non-smoking spouses of non-smokers. Even though the RR was only 1.19 the agency concluded this was proof that SHS increased the risk of US nonsmokers developing lung cancer by 19%.

In November 1995, after a 20-month study, the Congressional Research Service released a detailed analysis of the EPA report that was highly critical of EPA's methods and conclusions.¹¹ In 1998, in a devastating 92-page opinion, Federal Judge William Osteen vacated the EPA study, declaring it null and void.¹² He found a culture of arrogance, deception, and cover-up at the agency. He noted, "First, there is evidence in the record supporting the accusation that EPA "cherry picked" its data...In order to confirm its hypothesis, EPA maintained its standard significance level but lowered the confidence interval to 90%. This allowed EPA to confirm its hypothesis by finding a relative risk of 1.19, albeit a very weak association...EPA cannot show a statistically significant association between [SHS] and lung cancer." And, "EPA publicly committed to a conclusion before the research had begun; adjusted established procedure and scientific norms to validate its conclusion; and aggressively utilized its authority to disseminate findings to establish a *de facto* regulatory scheme to influence public opinion."

Several years later, in 2003, a definitive paper on SHS and lung cancer mortality was published in the British Medical Journal by Enstrom and Kabat.¹³ It is the largest and most detailed ever reported. The authors studied more than 35,000 California never-smokers over a 39-year period and found no statistically significant association between exposure to SHS and lung-cancer mortality.

The 1992 EPA report is an example of the use of epidemiology to promote an epidemic rather than to investigate one. It has damaged the credibility of the EPA and has tainted the fields of epidemiology and public health. In addition, influential anti-tobacco activists, including prominent academics, have unethically attacked the research of eminent scientists, such as Dr. James E. Enstrom of UCLA's School of Public Health and Dr. Michael Siegel of Boston University's School of Public Health, in order to further their ideological and political agendas.^{14,15}

The abuse of scientific integrity and the generation of faulty “scientific” outcomes (through the use of pseudo-science) have led to deception of the American public on a grand scale, and to draconian government over-regulation and the squandering of public monies. Millions of dollars have been spent promoting SHS as a killer and more millions of dollars have been spent by businesses in order to comply with thousands of highly restrictive bans, while personal choice and freedom have been denied to millions of smokers. Finally, all this has diverted resources away from discovering the true cause(s) of lung cancer in non-smokers.

Jerome Arnett, Jr. M.D.

Dr. Arnett is a pulmonologist who lives in Helvetia, WV.

¹ Texas Department of State. Health Services. *Most Respondents to Texas BRFSS Survey favor Protection from Second Hand Smoke in Public Places*. [<http://www.dshs.state.tx.us/chs/brfss/Reports/smokban.shtml>].

² Access Washington. Kittitas County Public Health. *Exposure to Second Hand Smoke Survey. Results of the 2004 Survey*. [<http://www.co.Kittitas.wa.us/health/toacco/shs004.asp>].

³ U.S. Public Health Service. Office of the Surgeon General. 1972. Atlanta, Ga.: *The Health Consequences of Smoking: A Report of the Surgeon General*. [http://profiles.nlm.nih.gov/NN/B/B/P/M/_/nnbbpm.pdf].

⁴ U.S. Public Health Service. Office of the Surgeon General. 1986. Atlanta, Ga.: *The Health Consequences of Involuntary Smoking: A Report of the Surgeon General*. [http://profiles.nlm.nih.gov/NN/B/C/P/M/_/nnbcpm.pdf].

⁵ U.S. Environmental Protection Agency. *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders: The Report of the Environmental Protection Agency*, EPA/600/6-90/006F, December 1992 [<http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=2835>] or [<http://heartland.temp.siteexecutive.com/pdf/16667.PDF>].

⁶ U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Office on Smoking and Health, June 27, 2006 [<http://surgeongeneral.gov/library/secondhandsmoke/report/fullreport.pdf>].

⁷ Hinds WC, first MW. Concentrations of nicotine and tobacco smoke in public places. *N Eng J Med*. 1975 April 17;292(16):844-5 [<http://legacy.library.ucsf.edu/tid/lrr57a00/pdf>].

⁸ Phillips K, Howard DA, Bentley MC, Alvan G. Measure exposures by personal monitoring for respirable suspended particles and environmental tobacco smoke of housewives and office workers resident in Bremen, Germany. *Int Arch Occup Environ Health*. 1998;71:201-12 [<http://legacy.library.ucsf.edu/tid/zdh67e00/pdf>].

⁹ Taubes G. Epidemiology Faces Its' Limits. *Science* 1995;268:164-9 [<http://legacy.library.ucsf.edu/tid/ftv34a00/pdf>].

¹⁰ Doll R, Hill AB. “Lung cancer and other causes of death in relation to smoking: A second report on the mortality of British doctors. *BMJ* 1956;2:1071-81 [<http://legacy.library.ucsf.edu/tid/fmk92f00/pdf>].

¹¹ Redhead CS, Rowberg RE. *Congressional Research Service Report for Congress. Environmental Tobacco Smoke and Lung Cancer Death Risk*. Congressional Research Service 95-1115, November 14, 1995 [<http://legacy.library.ucsf.edu/tid/eyk0lc00/pdf>].

¹² Osteen WL. Order and Judgment. *Flue-Cured Tobacco Cooperative Stabilization Corporation et al. V. United States Environmental Protection Agency, and Carol Browner, Administrator*, Environmental Protection Agency. U.S. District Court, Middle District of North Carolina. Winston-Salem Division, Decision 6:93CV00370, July 17, 1998 [www.junkscience.com/news2/osteen.htm].

¹³ Enstrom JE, Kabat GC. Environmental tobacco smoke and tobacco related mortality in a prospective study of Californians during 1960-98. *BMJ* 2003;326:1057-61 [<http://bmj.com/cgi/reprint/326/7398/1057.pdf>].

¹⁴ Enstrom JE. Defending legitimate epidemiologic research: combating Lysenko pseudoscience. *Epidemiol Perspect & Innov*. 2007;4:11 [<http://www.epi-perspectives.com/content/4/1/11>].

¹⁵ Phillips CV. Warning: Anti-tobacco activism may be hazardous to epidemiologic science. *Epidemiol Perspect & Innov.* 2007;4:13 [<http://www.epi-perspectives.com/content/pdf/1742-5573-4-13.pdf>].
