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Editorials and Topics for Our Times

Editorial: Significance of Workplace Smoking

What to do about workplace exposure to environmental tobacco smoke is becoming a serious public health policy issue.¹ That environmental tobacco smoke causes lung cancer and other adverse health effects has been well established.^{2,3} One official report attributes 3000 lung cancer deaths in the United States annually, as well as deaths from other disorders, to environmental tobacco smoke.⁴

So-called "side-stream" smoke (environmental tobacco smoke) exposes people to the same carcinogenic chemicals as those inhaled by smokers, although diluted by the ambient air. No credible evidence has been presented indicating a threshold level below which the adverse effects do not occur. In fact, the evidence demonstrates that the greater the exposure, the greater the likelihood of lung cancer, a monotonic increasing effect. A larger exposure to tobacco smoke, such as that among persons who smoke 2 packs per day, produces more lung cancer than occurs among 1-pack-per-day smokers. Those who smoke less have less likelihood of the disease, and nonsmokers exposed to environmental tobacco smoke have still less, but some. Studies of the environmental tobacco smoke effect, however, have focused largely on the residential situations in which spouses and children can be exposed.

What can be said about the lung cancer danger of workplace exposure? In this issue of the Journal, Wells⁵ presents a meta-analysis of 5 investigations (selected from 14 examined studies) that used what seem to have been reasonable criteria. A fundamental issue for any meta-analysis is the choice of studies. Exposure comparisons must be defined for each study in the same way or, at the least, to a good approximation. Thus, never vs ever smoking is the exposure comparison to be made, and studies to be included must enable this comparison. Wells added other reasonable criteria for eligibility. These criteria were defined before the data analyses were carried out, an essential requirement to eliminate selection bias in a meta-analysis.

One interesting feature of Wells's paper deserves special consideration. Using data from all 5 studies, he finds an odds ratio or relative risk of 1.39 (95% confidence interval [CI] = 1.15, 1.68). Four of the studies revealed a ratio greater than 1.00, but their confidence intervals all included 1.00. The fifth, however, which contained more than three fifths of the cases included in the meta-analysis and involved more than 50% of the studies' weight, revealed a ratio of 1.56 (95% CI = 1.21, 2.02).⁶ Thus, the 1 study with enough cases to carry by itself a confidence interval generally accepted as significant and meaningful yielded an odds ratio or relative risk similar to (even a bit higher than) the result of the meta-analysis. Should one doubt meta-analysis as an approach to the truth, the citation of the paper of Reynolds et al. confirms previous estimates of the relative risk from environmental tobacco smoke for lung cancer.⁷

The major significance of Wells's paper, however, lies in its refutation of 5 other recent meta-analyses of the relationship between lung cancer and workplace environmental tobacco smoke. Wells meticulously elucidates how these other meta-analyses obscured the finding of any relationship because they failed to take account of errors in the underlying studies accepted into their database. When these errors are corrected and all 14 of the original investigations are used (regardless of the selection criteria adopted by Wells), the result is a combined relative risk of 1.19 (95% CI = 1.07, 1.34), not that much different from the value obtained with the 5 studies originally used by Wells based on his criterion of choice.

The 5 meta-analyses that found no increased risk and that were faulted by Wells, all of which appeared in 1994 and subsequently, were authored by "tobacco industry employees or consultants." Thus, one cannot avoid the suspicion that these meta-analyses may have been undertaken as part of the

Editor's Note. See related article by Wells (p 1025) in this issue.

lawyer-directed research sponsored by tobacco companies in order to counter the accelerating moves toward tobacco use control.⁸

Media attention is now focusing on the national "settlement" proposal and on how it will fare in the next congressional session. Perhaps more significant battles against the health consequences of smoking are under way in many other situations. The latter include actions by several states to increase taxes on cigarettes and devote some of the revenue to tobacco control activities. Since such a program was inaugurated in 1988 in California, for example, the rate of decline in cigarette smoking has doubled. Local authorities throughout the country are passing ordinances forbidding the placing of cigarette vending machines where they are accessible to youngsters and prohibiting smoking in public buildings. California has extended the latter to include all restaurants and bars. In Florida, airline flight attendants were successful in their lawsuit seeking compensation for health damage from workplace environmental tobacco smoke, and efforts to prohibit smoking on international as well as domestic US flights are gaining ground. Thus, environmental tobacco smoke is being recognized as an unhealthful condition, one to be avoided.

As expected, the tobacco industry is combating this trend in every possible way: by sponsoring research aimed at contradicting the evidence of health damage from inhaled or environmental tobacco smoke, by advertisements and other promotional efforts, and by funding political campaigns designed to build legislative support for tobacco interests.

Perhaps the most subtle tobacco industry appeal is to the deeply ingrained libertarian

trend in American philosophy. That thinking emphasizes individual rights, particularly freedom from arbitrary governmental action. Thus opponents of tobacco control spread the notion—often set up by the industry as a "strawman" to be knocked down—that tobacco control advocates seek to prohibit cigarette smoking altogether. Another approach is to defend loudly an individual's right to smoke in his or her own home, knowing that Americans would clearly not tolerate such invasion of privacy. A still further step is to assert the individual right of elderly, longtime smokers in nursing homes to continue smoking in their own quarters. The latter claim begins to encroach on preserving the common good, the opposite trend in American philosophy. How much danger comes to others from environmental tobacco smoke that escapes into the nursing home's common airspace or, perhaps more pertinent, from the fire hazard created by a resident's smoking? One can then proceed to question whether enough damage to health ensues from workplace smoking to justify coercing people to "go outside" to smoke.

There is no quantitative or "scientific" answer to that question because it deals with 2 different value systems, health and individual liberty; these value systems cannot be equated quantitatively. The answer thus becomes a matter of judgment. In that conflict of values, those of us concerned with health must insist on preserving the common good and oppose any danger to the health of others created by individual actions. The issue is not whether a 20%, 40%, or 1000% increase in lung cancer risk arising from workplace environmental tobacco smoke justifies requiring smokers to "go outside" to smoke. Any increase in that

risk justifies protecting the workers' health. Firm knowledge concerning health damage from workplace environmental tobacco smoke is hence crucial to determining whether worker health needs protection on that score. The paper by Wells will contribute significantly to combating what is still the top cause of preventable mortality in the United States. □

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Editorial: Are You Certain?—Uncertainty, Health, and Safety in Contemporary Work

Driven by international competition and the rapid pace of technological change, corporate mergers, acquisitions, and downsizing have become an important part of commerce in the last decade of the 20th century. In the United States, downsizing led to more than 10 million workers being displaced or losing their jobs between 1989 and 1992 and well over 500 000 announced layoffs in both 1993 and 1994.¹ According to an analysis of Labor Department data by the *New York Times*,² 43 million jobs were eliminated between 1979 and 1995. These figures suggest that, for many American workers, this is indeed an age of uncertainty.

Social scientists and epidemiologists have long had an interest in the adverse health

impacts of what is perhaps the most individually salient of all forms of workplace uncertainty: uncertainty regarding future employment status. Beginning with the truly seminal work by Kasl and Cobb^{3,4} at the University of Michigan's Institute for Social Research, researchers over the past 32 years have linked both the anticipation of job loss and the loss itself (entailing losses of identity, social roles, and self-esteem) to a variety of deleterious physical and psychological consequences. In a recent study⁵ and in a further analysis reported in this issue,⁶ Ferrie et al. have built upon this body of work by providing yet more rigorous evidence of a relationship between employment uncertainty and morbidity.

Health concerns aside, there seems to be some uncertainty regarding if and when downsizing is an effective business strategy. Many employers seem steadfast in the belief that downsizing (which often engenders employee uncertainty) results in better corporate performance. Evidence in the US labor market that jobs are becoming less stable and that long-term employment relationships are becoming less common⁷ seems to attest to this conviction. Findings from a recent study⁸ of companies in 5 highly competitive industries, however,

Editor's Note. See related article by Ferrie et al. (p 1030) in this issue.