

When Science Gets Distorted for Nonscientific Reasons

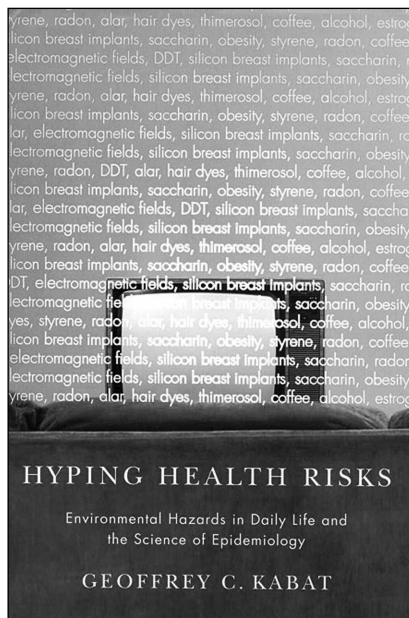
TERENCE HINES

Hyping Health Risks: Environmental Hazards in Daily Life and the Science of Epidemiology. By Geoffrey C. Kabat. Columbia University Press, New York, NY, 2008. ISBN 978-0-231-1418-2. 250 pp. Hardcover, \$27.95.

Geoffrey C. Kabat, a senior epidemiologist at the Albert Einstein College of Medicine, argues strongly and persuasively in this excellent book that misinterpretations of epidemiological data, often by epidemiologists themselves, have resulted in a society “hyperattuned to anything that may affect our health” (p. xi). He tells four important scientific detective stories, all ending with the accused being cleared of almost all charges. The original charges were brought by epidemiological studies of, at best, dubious quality. In one case, that of possible effects of second-hand cigarette smoke, the science was badly perverted to support the preexisting expectations of the prosecutors. Findings that contradicted the politically correct view were met with attempts at outright suppression and when published, were followed by personal attacks on the authors’ integrity but not on the quality of their science. This is a disturbing story of science’s betrayal by the very people who are charged with using scientific results to guide rational decisions about health risks.

An introductory chapter titled “Toward a Sociology of Health Hazards in Daily Life” sets the stage for the author’s

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discussion of how social and political influences shape the way health risks are investigated and reported. The second chapter, “Epidemiology: Its Uses, Strengths, and Limitations,” is an excellent review of epidemiological methods and techniques. It clearly explains different types of studies, such as descriptive, case-control, cohort, randomized, etc., and the strengths and weaknesses of each. Tricky subjects such as statistical interactions, establishment of causality, absolute versus relative risks, pooling of studies, and meta analysis are all covered.

The next four chapters are case studies of specific health scares. The chapters cover environmental causes of breast cancer (chapter 3); power lines and cancer

(chapter 4); risks of residential radon (chapter 5); and, finally, the risks of second-hand cigarette smoke (chapter 6). There is a concluding chapter followed by two appendices, extensive bibliographical notes, bibliography, and an index.

In the 1990s it was claimed that there was an epidemic of breast cancer on Long Island. Sometimes cancer does occur more often than would be expected by chance. The psychological desire to blame something obvious and identifiable for such clusters is easy to understand. It’s much more satisfying to have a known villain to blame than to put the cause down to amorphous statistical deviations from chance. The result is a search of the local environment. Inevitably, such a search yields an excess of power lines, leaky old oil tanks, microwave towers, or some such, which are promptly blamed for the cluster.

The villain singled out in the Long Island breast cancer scare was unspecified environmental pollution. The belief that this was responsible led Congress to require an expensive study of environmental factors in the causality of breast cancer on Long Island that ended up costing millions of dollars but provided no new knowledge about the causes of breast cancer. This is a prime example of political and social—as opposed to scientific—factors driving which issues receive research funding. In the end, all the expensive government-funded research showed no influence by environmental

pollutants on breast cancer rates.

In the next chapter Kabat takes up the claim that electromagnetic fields from power lines cause cancer. This health scare first popped up in the 1980s. Even though it has been entirely debunked in the scientific community, it is still alive and well in the public mind. It is far easier to whip up fears than to reduce them. Much like the Long Island breast cancer scare, the hysteria over power lines started when untrained individuals, especially parents of children with cancer, noted that cases of childhood cancer seemed to be more common in areas with a large number of power lines. This sort of “evidence” is emotionally compelling but totally invalid—a dangerous combination. The hysteria was further fed by conspiracy theorist Paul Brodeur, who wrote a series of articles in the *New Yorker* and books promoting the view that the power companies were covering up the danger of power lines. This chapter covers the history of the power line controversy quite well, with discussions of some of the hypotheses put forth to explain the relationship between power lines and cancer that, in the end, didn't exist.

One failing of this otherwise excellent book is that Kabat doesn't emphasize one of the major reasons for the false belief in these various health scares: the multiple comparison fallacy. The basic idea is that if one makes enough comparisons one can find, just by chance, results that seem to show that, say, stamp collecting causes cancer. The classic example of this was the infamous Swedish study of the dangers of power lines. The published paper reported sixty-six different risk ratios. The only one that got much attention was one that showed a four times higher risk of cancer for those living near power lines. But this one was only one out of sixty-six reported results. It gets worse. The published paper (*American Journal of Epidemiology*, 1993, 138, pp. 467–481) was just a summary of a study in which nearly 800 risk ratios were computed.

Out of that huge number, it would be very surprising if at least one result *didn't* show such an increased risk, just by chance. And, of course, among those 800 results many showed that those who lived near power lines had a reduced risk for developing cancer.

The next chapter discusses the risks of residential radon. Remember that scare from the 1980s? That health worry has happily gone the way of eight-track tapes. But as Kabat explains, the hype about the risks of radon was based on the same sorts of errors as those made in overstating the risks of environmental pollution for breast cancer and power lines for cancer. A special strength of this chapter is an important discussion of the difficulty in measuring actual exposure to residential radon, which might seem simple but certainly is not.

The final case study is by far the most controversial. Kabat argues that there is essentially no risk of getting cancer or heart disease from second-hand or passive tobacco smoke. This flies in the face of accepted wisdom. I was very surprised as I read this chapter to see that the evidence linking second-hand smoke to disease was so weak as to be basically nonexistent. So where does the hype come from? It is here that Kabat is at his best as he describes how the actual results of studies of second-hand smoke have been co-opted to push the political agenda of those wanting to ban smoking in public places. I'm totally in agreement that such smoking should be banned. It's as annoying and repulsive as someone sitting at a nearby table in a restaurant playing a loud radio. But we can quite properly ban playing loud radios in restaurants, theaters, airplanes, trains, and offices without having to resort to distorting the science to argue that “second-hand listening” causes cancer of the inner ear.

The misrepresentation of the studies of the effects of passive smoking has clearly distorted the science that aims to prove ill effects of passive smoking. At this point, I expect that someone will point out that Kabat was an author of a

large study funded by the tobacco industry that found no effect of passive smoke. True enough—the study, funded by the Center for Indoor Air Research (CIAR), was published in the *British Medical Journal* (May 17, 2003). It reported further follow up of more than 115,000 individuals who had been examined for effects of passive smoking over a period of many years. The American Cancer Society (ACS) had started the study in 1959. Kabat and his co-author James Enstrom tried to obtain funding for this study from several sources, including the ACS, and were turned down. Kabat makes it clear that CIAR had absolutely no influence over the study at any time and was not even given a copy of the paper. They, like everyone else, saw it upon publication. The paper was roundly attacked by the American Cancer Society and its supporters. Letters poured into the *British Medical Journal*. But the great majority simply raged at the authors without making any attempt to criticize the paper on scientific grounds.

Kabat quite properly calls this response scientific McCarthyism. He shows that agencies like the ACS and state and federal environmental protection agencies have willfully distorted the science of second-hand smoke to push the otherwise laudable goal of banning smoking in public places. In one case the Massachusetts Lung Association attempted to suppress publication of a study that did not support its position that second-hand smoke is dangerous, but “Harvard University had a firm policy” (p. 163) that allowed the paper to be published. These attempts to distort the science to support a particular policy, something done for years by the tobacco industry when it came to the dangers of actual smoking, can properly be called a “betrayal of science.” This book, especially this chapter, should be read by anyone interested in how political pressure can change not only what science gets funded but how science is misrepresented even in official documents that should be objective. □