

Limitations of Environmental Epidemiology for Guiding Environmental Policy

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Background and Aims: Environmental epidemiologists aspire to generate research findings that provide an objective basis for the formulation of environmental policy. The ideal scenario in which epidemiologic research and policy are perfectly aligned is rarely realized, and efforts to force the epidemiologic evidence to fit sound policy can be detrimental to both.

Methods: I will examine illustrative current debates in environmental health policy in which the incremental, future contributions of epidemiology to their resolution appears to be limited: environmental tobacco smoke, drinking water treatment by-products, and electromagnetic fields. The past contributions and limits of further epidemiologic studies in these areas for guiding policy will be summarized.

Results: Sound policy decisions benefit from general guidance from epidemiology but also draw heavily on findings from toxicology and other contributory sciences, consideration of social and financial costs of alternative courses of action, and extrapolation of epidemiologic evidence. Epidemiologic research should be undertaken to inform policy in these areas when the capabilities of epidemiology match the needs of policy makers. In these examples, the inherent limitations in available epidemiologic methods (which could change with fundamental advances) suggest that additional studies offer little promise of contributing meaningfully to regulatory policy.

Conclusions: Recognizing that sound policy cannot and need not rely on definitive epidemiologic evidence would reduce the pressure to overstate certainty of epidemiologic findings, focus attention on identifying important policy questions that epidemiology is capable of addressing, and free policy makers of needing to invoke direct epidemiologic support for their decisions. Acknowledgment of the important but imperfect connection between environmental epidemiology and environmental policy would promote a more even-handed appraisal of the epidemiologic evidence and more strategically conceived epidemiologic studies, and potentially improve the quality of environmental policy.