

## Environmental epidemiology: An introduction

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Editorial

### INTRODUCTION

Epidemiology is increasingly coping with problems correlated with exposures which may have small relative risks. In fact, many chronic diseases, as the most recent common diseases all over the world, may have unknown etiology but also potentially related to environmental exposures. Environmental epidemiology considers the effect of environmental factors on health. More exposure with increasing number of potential environmental hazards has changed the initial application of environmental epidemiology. As a consequence, nowadays it is strongly emphasized on some fields such as molecular epidemiology, but some others have discussed about the importance of its population dimension and the reintegration of epidemiology into public health.

Environmental epidemiology research, as a very substantial scope of epidemiology, can consider risk assessments, development of standards and other risk management activities. In addition, it could estimate the co-benefits and co-harms of policies designed to reduce global environment changes, including policies implemented in other sectors (e.g. food and water) affecting human health.<sup>1</sup> Environmental epidemiology has indeed several unique features that could make these

debates very important. Furthermore, a large number of environmental exposures may require prioritization, with usually very low relative risks.<sup>2-3</sup> However, environmental epidemiology has also a more restricted connotation, referring to those environmental factors that are outside of the immediate control of the individual.<sup>2</sup> The most important difference of environmental epidemiology with general epidemiology is that the first one could focus more on the living/working environment of people rather than on their personal characteristics or lifestyles.

During the recent centuries, environmental epidemiology has achieved remarkable positive health gains by efforts on reduction of the population's exposure to contaminants in air, water, and soil. However, in the last decades, this concentration has been changed to follow the developments in epidemiology and molecular biology. In fact, with increasing focus on individual exposures and his/her own susceptibility as well as potential mechanisms, environmental epidemiologists may lose their traditional population perspective of disease causation and prevention.<sup>4,5</sup>

Generally, environmental epidemiology may concern on the potential health effects of

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environmental factors, mostly outside the immediate control of the person. In industrialized countries, environmental epidemiologists must mainly assess a large number of low-level inter-correlated exposures, often occurring in complex mixtures. In that respect, environmental epidemiology could be similar to nutritional epidemiology, except for the fact that environmental exposures may usually be involuntary and may not differ significantly among population of one area.<sup>6</sup>

It is worth to note that many of the problems of environmental epidemiology may become especially severe during local field investigations in response to acute public health problems, such as a cluster of cancer in a neighborhood or around a point source. In this situation, the level of exposure is often low and may have happened in the distant past. Most of the time, there is no clear hypothesis; for example, the small number of residents may give sufficient power to detect only relative risks that are unrealistically high in the environmental setting, or the latency period may be insufficient.<sup>2</sup>

Environmental epidemiologists may not be ready to consider other health outcomes and issues of public concern, such as psychological effects, aesthetic values, social disruption, or effects on property values which may be the main concern of the public at this moment. Therefore, the large number of environmental exposures should be considered

by environmental epidemiology, but it needs to be prioritized the issues to be studied, based on the local environmental problems by (environmental) epidemiologists.<sup>7</sup>

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