EDITORIAL

Real epidemiologists don’t do ecological studies?

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The papers by Tapia Granados1,2 and the accompanying commentaries3–8 provide a most welcome debate for epidemiologists interested in the role of macro-level socioeconomic factors in determining mortality risk. Leaving aside technical arguments around the statistical methods, this work is challenging and should be of interest to many readers. The observation that mortality actually increases during periods of economic expansion, though not new, is counterintuitive and strikes deep at the heart of social epidemiology that believes improving socioeconomic conditions should be associated with better health. It is therefore unsurprising that this observation is strongly challenged. However, as Tapia Granados,1,2 Edwards,4 and Rhum8 discuss, there are reasons (access to health care, health behaviours, working conditions, road traffic accidents, etc.) why economic upturns may be associated with worse health in the US. The fact that this paradoxical observation is in the opposite direction to the long-term trends in economic growth and life expectancy, and that epidemiological studies have consistently shown that unemployed populations have worse health than those in employment, does not necessarily refute these ecological patterns. I won’t dwell on the arguments here as the papers by Tapia Grandos and the accompanying commentaries go into these in depth and make for excellent reading.

It is perhaps not surprising that most of the research in this area has been undertaken by economists, demographers, or social scientists rather than epidemiologists. However studying fluctuations in economic growth should be of great interest to social epidemiologists and public health practitioners. The last decade or so has seen a major revival for both theoretical9–13 and empirical14 uses of contextual or macro-level variables in explaining health variations. This runs parallel to the emphasis of pregnant women during the World War II to examine the potential effects of under-nutrition during the fetal period on childhood growth and development and has more recently been applied to chronic disease aetiology.21

Simple cross-sectional ecological associations are usually dismissed as mere hypothesis-generating exercises, confounded by the ecological fallacy and very weak evidence for causality. For example, the effect of daily variations in air pollution on mortality, where individual confounding factors remain constant over time, provides strong evidence for a causal effect.22 Applying such environmental approaches to variations in health care and economic or social policies has been relatively under-utilized though is clearly not without problems. Ecological comparisons of different health care systems remain confounded by other societal factors that influence the nature of health care provision (insurance or national health) and other social welfare policies.

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time may be confounded by other secular trends. However, by combining secular and geographical variations it may be possible to examine how likely associations are to be explained by confounding factors since different patterns of confounding are likely to be at play over time in the same geographical area and at the same time between different geographical areas for some of these factors. In addition, the analysis of temporal rather than cross-sectional data can allow one to examine for lagged effects rather than simple acute responses through either the effects of early life programming on disease risk or long-term accumulation of adverse exposures through a variety of different life course pathways.23,24 The ultimate in any ‘fantasy epidemiology’ is the dataset that combines both individual and contextual variables over the life course for many different areas or populations with heterogeneous ecosocial factors. This would enable one to examine the potential influence of macro-level variables on both individual level intermediary causal factors as well as interactions between macro-level and individual variables as policy changes may not affect all segments of society equally or all countries in the same way. Whilst such a dataset may currently be in the realms of make-believe, we must clearly make greater use of other ‘naturalistic’ opportunities to answer policy-related questions.

In the international bestseller ‘Freakonomics’, Steven Levitt and Stephen Dubner describe the natural experiment imposed by the Chicago Public School system on school choice, whereby parents who wished to send their child to a high performing school outside their area were randomly selected to get their choice or not, through a lottery-based system, thus allowing researchers to determine whether school choice made a difference on academic performance.25 Sadly for us, policymakers rarely allocate interventions on a random basis and often do not even pilot major initiatives. However, different macro-level policies within populations over time and between populations should remain fertile ground to try and test aetiological hypotheses both around aetiology as well as evaluating the public health impact of such policies. Perhaps we need more freaky epidemiology?

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