


Causal Thinking as a Critical Tool for Eliminating Social Inequalities in Health

 See also Galea and Vaughan, p. 602; Hernán, p. 616; Begg and March, p. 620; Ahern, p. 621; Chiolero, p. 622; Jones and Schooling, p. 624; and Hernán, p. 625.

Health researchers are long overdue to fully embrace causal language, as Hernán (p. 616) recommends. Appropriate analytic methods to answer causal questions differ from methods for noncausal questions (e.g., purely prediction problems), and opaque language hinders appropriate study designs. Although the need for transparency when stating research goals might seem obvious, ambiguous phrasing remains common.

In social epidemiology, fuzzy language is sometimes a defensive tactic to circumvent skeptical reviewers, but such hand waving handicaps the field. Investigators should specify whether the goal is to answer a causal question, while acknowledging that results are only estimates of causal parameters: interpretation is always contingent on additional assumptions, even in randomized controlled studies. This critical distinction between the goals of research (to address causal questions) and the interpretation of results (which correspond with causal parameters only under specific assumptions) should underlie the development, implementation, and evaluation of health research.

The causality wars have special importance for social epidemiologists and others who seek to reduce health inequalities. Social epidemiology often aims to provide evidence on how to reduce health inequalities arising from social factors such as education, poverty, and discrimination. It is tempting to assume that

when an injustice is obvious, the solutions are equally obvious. Yet, we often falter in translating research into action to ameliorate even the most shocking injustices: seemingly reasonable interventions may not function as anticipated,¹ treatments may affect diverse groups differently,² and observational evidence is often too vague to be directly translated to interventions.³

Such stumbles highlight the importance of critically considering exchangeability, heterogeneous treatment effects, and consistency in observational research.⁴ Although social epidemiologists have many causal questions, we must rely heavily on observational research. Randomization of social factors is usually unethical, infeasible, or both. The methodological framework and tools developed in the causal inference movement of the past 30 years are therefore particularly important for social epidemiologists. Triangulation of results from diverse observational studies is critical.⁵

To understand the designs and analyses that are needed, we must first start by articulating clear causal questions, prior assumptions, and most plausible sources of noncausal association, which might be represented via causal diagrams. Findings from alternative designs, including qualitative research, can often provide complementary evidence to support causal inference.

Methods such as instrumental variables, regression discontinuity, and difference-in-differences approaches often creatively leverage natural variation in exposures arising from quasi-experimental circumstances.⁶ These methods often—although not always—address confounding more robustly than conventional analyses of observational data (e.g., regressions with confounder control or propensity score models). Alternative methods can be conceptualized as falling along a spectrum of support for causal inferences, with some designs better accounting for likely biases, recognizing that the “best” design depends on the current state of the evidence and the specific question.

Social epidemiologists may be alienated from causal thinking because of past arguments about whether social constructs, such as race, gender, and inequality, are amenable to rigorous evaluations of causal effects. Such exposures are well within the realm of causal thinking.⁷ Approaching the dominant questions in our field with a causal lens is the best strategy to deliver the causal evidence we need to reduce racial, gender, and other health inequalities.

Research on social inequalities is sometimes dismissed as ideologically motivated. Precisely

because many people have strongly established opinions about issues such as how poverty affects health, we need to scrupulously apply the most rigorous methods to answer these questions. The next step is a frank discussion about what methods are most likely to deliver causal evidence on the social determinants of health. **AJPH**

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