

Why Epidemiologists Cannot Afford to Ignore Poverty

Nancy Krieger

Abstract: Epidemiologists cannot afford to ignore poverty. To do so would, first, wrongly obscure the devastating impact of poverty on population health, and, second, undercut our commitment to scientific rigor. At issue is doing correct science, not “politically correct” science. Blot poverty and inequity from view, and not only will we contribute to making suffering invisible but our understanding of disease etiology and distribution will be marred. To make this case, I address current debates about the causal relationships between poverty and health, and provide examples of how failing to consider the impact of socioeconomic position has biased epidemiologic knowledge and harmed the public’s health. By definition, the people we study are simultaneously social beings and biologic organisms—and we cannot study the latter without taking into account the former. It is the responsibility of all epidemiologists, and not only social epidemiologists, to keep in mind the connections between poverty and health.

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The topic of poverty is nothing new to epidemiology. Indeed, our field’s emergence as a scientific discipline in the early 19th century was intimately entangled with research on destitution, spurred by the global public health impact of that era’s massive transformations in ways of living and of dying.^{1–4} The Industrial Revolution and the unleashing of *laissez-faire* capitalism sparked the creation of a fast-growing impoverished urban working class, massive increases in international trade, and an expanding military presence in colonized countries and outposts across the 5 continents.^{1–4} Cities in Europe and the Americas swelled in size, as did their levels of squalor, stench, poverty, and disease.^{1–4} Cholera and yellow fever were brought to the “West” by army routes and commerce, including the slave trade. These devastating “emerging diseases” of the age were all the more dreadful because they were lethal maladies of unknown etiology and inexplicable onset.^{1–4} To these diseases and the other endemic causes of death, the poor dis-

proportionately succumbed.^{1–4} Available jobs paid starvation wages and were dangerous; slum housing was unsafe, crowded, and without private plumbing; malnutrition and other comorbidities were rampant; and the poor could not afford to flee these conditions when pestilence struck.^{1–4} Through the urgent study of these problems, epidemiology, as a self-designated field of scientific study, was born.¹

Epidemiology’s early focus on poverty was thus a necessity, not an option. But in this widely-trumpeted era of the human genome,^{5–7} what relevance does poverty have to epidemiology today?

One ready answer: in a world where 2 in 5 of our planet’s 6+ billion people lack sanitation and live on less than \$2 a day (ie, “absolute poverty,” as defined by the World Bank), where 1 in 5 lack access to clean water and live in extreme poverty on less than \$1 a day, and where less than 1% of the world’s adult population owns 40% of the world’s wealth while 50% owns less than 1%,^{8–10} documenting and analyzing links between impoverishment and population health remains a public health imperative. The magnitude of the problem is vividly portrayed in the maps of global inequities in poverty, wealth, and health shown in Figure 1.⁸

Second, even in the world’s wealthy countries—where most of the institutions that teach epidemiology are located—economic deprivation remains strongly associated with morbidity and mortality.^{11–18} For example, I live in Boston, Massachusetts, home to “74 colleges, universities and prestigious research institutions,”¹⁹ including 2 schools of public health²⁰ and 3 medical schools.²¹ My colleagues and I recently have shown that in Boston, fully 25 to 30% of premature deaths before age 75 occurring in 1999–2001 in the city’s poorest census tracts would not have happened if their residents had died at the same age-specific mortality rates as persons residing in the most affluent census tracts (Fig. 2).²² Statewide, risk of premature mortality increased with level of poverty and was nearly 2.5 times higher among persons living in the most compared with the least impoverished census tracts.²³ In 2006, 12% of the total US population and 20% of US children under age 5²⁴—including, respectively, 8 and 12% of white non-Hispanics, 25% and 38% of the black population, and 22% and 31% of Hispanics²⁴—lived in households below the notoriously low²⁵ US poverty line. Whether one conducts epidemiologic research in impoverished or wealthy countries, economic deprivation is present and it matters.

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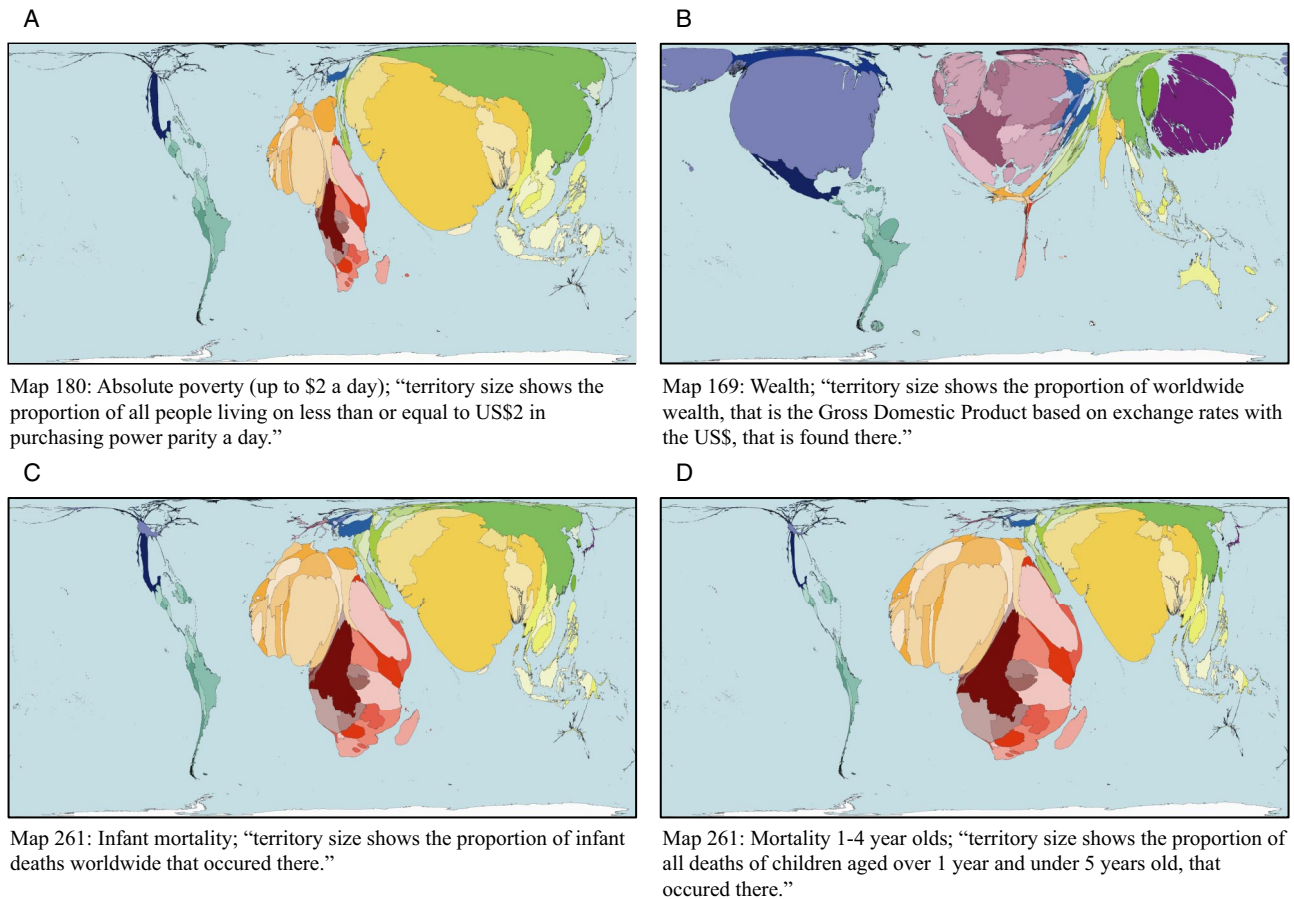


FIGURE 1. Global inequities in poverty, wealth and health (2002): maps from the Worldmapper Project (www.worldmapper.org),⁸ scaled according to the variable depicted. Copyright 2006 SASI Group (University of Sheffield) and Mark Newman (University of Michigan), and used with permission.

Beyond these substantive problems, there is still another reason why epidemiologists cannot afford to ignore poverty: our commitment to scientific rigor, no matter what our topical interests. At issue is doing correct science²⁶—and not, as some would have it, “politically correct” science.²⁷ Blot poverty and inequity from view, and our understanding of disease etiology and distribution will be marred. To make this case, I address 2 unspoken questions in our field to argue why it is our intellectual responsibility to address poverty and health.

QUESTION 1: DO WE REALLY NEED MORE RESEARCH ON POVERTY AND HEALTH?

Stated simply: yes. Though consensus may exist that poverty and poor health are associated, there is considerable division as to why they are linked. In the United States and globally, longstanding arguments continue to rage over whether “the poor” fare poorly because of (a) their own innate deficiencies, whether moral, intellectual, or biologic; (b) a causal arrow that runs principally from poor health to

economic poverty, with illness interfering with earning (and learning) capacity; or (c) social injustice, requiring redistributive justice (which is where the weight of the evidence lies).^{11–18,25–34} Within the United States and other wealthy countries, additional debates focus on whether poverty’s harm is due to material want versus psychosocial stress, and thus on whether the public health and policy focus should be on “poverty,” ostensibly affecting a minority, versus the “socioeconomic gradient,” ostensibly affecting everyone.^{11–18,33–36} Not surprisingly, these disputes hinge on how poverty is conceptualized, measured, and analyzed. Ongoing arguments, now centuries old, continue to question whether “poverty” and “the poor” should be defined with reference to “absolute” versus “relative” measures, income versus consumption, and solely economic deprivation versus additional aspects of social exclusion.^{11–18,30–36}

These sharp debates arise because of their policy and political ramifications: who stands to gain, and who stands to lose? On one side of the poverty-health debates are proponents of the unbridled free market; on the other, are those who seek a more democratically controlled and

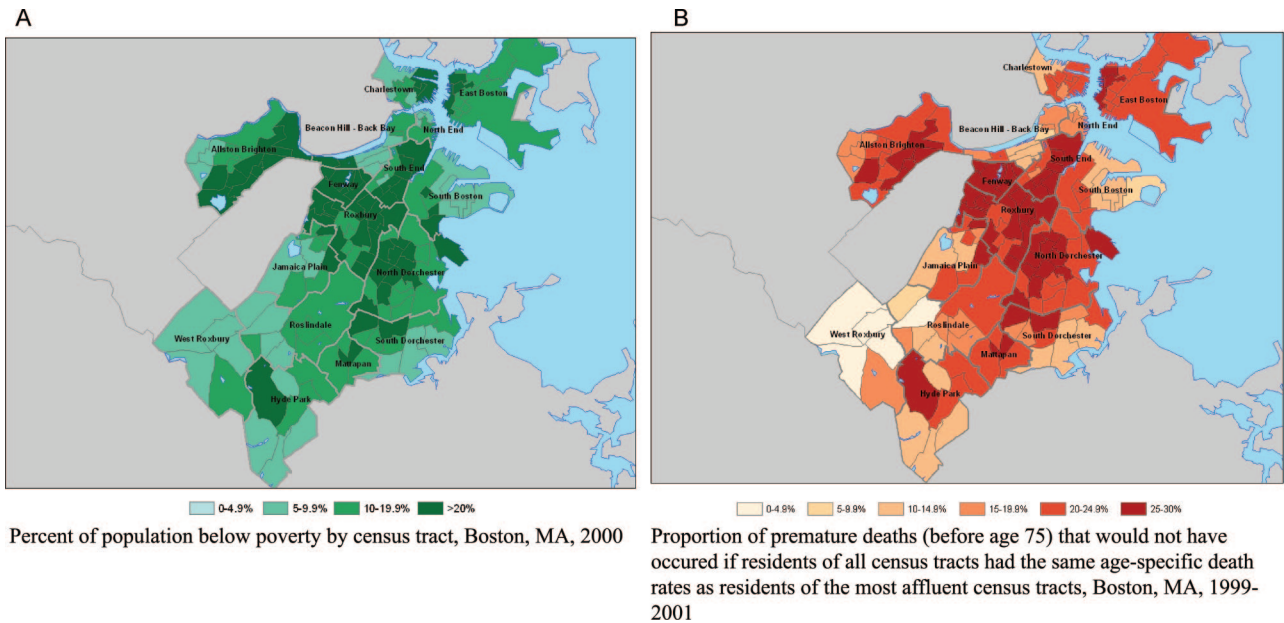


FIGURE 2. A, Census tract poverty levels, Boston, MA, 2000 and B, population attributable fraction, in relation to census tract poverty, for premature mortality (death before age 75): Boston, MA, 1999–2001. Reprinted with permission from *J Urban Health*. 2006;83:1063–1084.

egalitarian economy.^{11–18,25,30–33} Disputes between “neo-materialist” and “psychosocial” epidemiologists—both of whom seek to increase social equality and reduce health inequities—are likewise heated, with their focus not on whether but how inequality harms health, and hence what the societal remedies should be.^{13–18,35,36}

Beyond the overtly political aspects of the poverty health debates looms still another problem: the complexity of causal inference, especially when studying population health.^{37–41} For obvious reasons, researchers cannot ethically randomize people to various levels of economic resources. One alternative is to analyze the health impact of economic policies whose enactment varies by time or space. Even so, it can be difficult to disentangle the impact of a particular policy from the effects of other contemporaneous societal changes.^{37,38} Another alternative is to conduct longitudinal analyses of socioeconomic position and health across the life course, although few population-based longitudinal datasets have high-quality data on both health status (eg, based on physical examination and biomarkers, rather than self-reported health) and socioeconomic position (at the individual, household, or area level, let alone all 3).^{37,38} Grappling with these problems has led to improvements in methods, questions, and data for epidemiology overall. For example, epidemiology’s recent adoption of multilevel, life course, instrumental variable, and propensity score analytic methods have all been propelled by debates over how social conditions shape health.^{37,38}

There accordingly are at least 2 reasons for continuing to study poverty and health. One is to keep before the public’s eye the magnitude of the problem, so that the suffering can be made actionable, rather than be ignored or accepted as inevitable.^{11–18} Doing this work, and doing it well, is a core public health function of epidemiology.

The second reason is to make good on the claims of science to adjudicate among competing claims.^{39–41} To those who charge that investigating links between poverty and health is political, not scientific,²⁷ the obvious rejoinder is that it is even more political to ignore these connections than to study them.^{14–17,25,26,33,40,41} Our testing of ideas in the public domain, using rigorous and transparent methods, is what allows us to move beyond mere opinion and prevents ideology from being the sole arbiter of what counts as knowledge.^{26,40,41} As long as poverty exists and is associated with health, debates will rage over why these connections exist. Consequently, one of the essential “uses of epidemiology” (famously argued by Jeremy Morris in his pathbreaking 1957 epidemiology textbook by this name⁴²) is precisely to ensure the existence of sound population-based data on poverty and health. With such data, we can rigorously test hypotheses regarding the direction of the causal arrows and measure the magnitude of poverty’s toll on population health.

QUESTION 2: WHY BOTHER ABOUT POVERTY IF YOU’RE NOT A “SOCIAL EPIDEMIOLOGIST”?

What if your primary interest, as an epidemiologist, has nothing to do with the links between poverty and health? Do

you still need to pay attention to how economic circumstances affect health?

Yes, for 2 reasons. One is the serious problem of confounding: many of the exposures epidemiologists are interested in coexist and are jointly embodied—not necessarily because they are causally connected, *per se*, but because they are entangled by the ways people actually live in their societal context, replete with constraints as well as possibilities.^{14,16,40} The second is the problem of selection: whom we study sets the range of possibility for comparisons. If the range is too narrow, whether by design or by selection bias, the constrained variability may preclude detecting important etiologic exposures, or may bias estimates of their effect.

Consider the shock waves still rippling from release of the Women's Health Initiative (WHI) results in 2002.^{43,44} Whatever controversies may persist over links between hormone therapy and adverse or beneficial cardiovascular outcomes,^{43–50} the evidence now clearly shows that the failure of some observational studies to control adequately economic affluence—and its inevitable association with better health and a greater likelihood of being prescribed and being able to afford hormone therapy—wrongly found that hormone therapy reduced risk of cardiovascular disease.^{44,46,50} Prior to the WHI results, however, proponents of hormone therapy discounted these concerns, arguing that controlling for education, or studying women who belonged to one overall occupational group (eg, nurses), was sufficient to address socioeconomic confounding.^{44,51,52}

What harm was caused by failing to take class seriously? One answer lies in the population burden of iatrogenic breast cancer brought about by uncritical use of hormone therapy.^{44,53}

Recall that epidemiologic data had clearly shown that the absolute risk of breast cancer was higher than that of cardiovascular disease among perimenopausal women, particularly among the great majority who were nonsmokers.^{44,53} Thus, recommendations for hormone therapy effectively asked these women to increase their short-term and not inconsiderable risk of cancer, with the hope of decreasing their long-term risk of cardiovascular disease.^{44,53} The trade-off has been costly. Studies conducted between 2002 and 2005 in the United States, United Kingdom, Australia, and Norway suggest that hormone therapy accounts for somewhere between 10 and 25% of observed breast cancer cases.^{54–57} In the United Kingdom, this has been estimated to translate to an extra 20,000 breast cancers among women ages 50–64 in the past decade alone.⁵⁴ New results, moreover, using post-WHI cancer registry data, indicate that between 2002 and 2003, US breast cancer rates fell by 7–11%, with this extraordinary decline especially evident among the types of breast cancer most linked to hormone therapy, ie, estrogen-receptor positive tumors among postmenopausal women.^{58–61} If, as suspected, this drop is shown



Children beg from drivers stopped at a traffic signal in India.
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to be causally related to the decline in hormone therapy, above and beyond any concurrent reduction of mammography rates,^{58–61} it would profoundly underscore the serious harms that can arise if epidemiologists ignore the impact of socioeconomic position on health.

Consider, as well, how socially-patterned selection bias can compromise investigation of causal associations. A thoughtful study demonstrates this problem by exploring unexpected results in a population-based case-control analysis of Hodgkin lymphoma.⁶² In the original study, the response rate for cases was 87% but only 65% for controls—the latter rate albeit on par with those reported in most current population-based epidemiologic studies.^{63,64} Comparing the sociodemographic characteristics of participating versus nonparticipating controls, the investigators found that among the controls, there was over-representation of women who were older, less educated, of color, and of higher birth order and higher parity.⁶² The net result was that adjustment of odds ratios for bias “strengthened previously null findings for education and for parity, breast-feeding and miscarriages in young adult women.”⁶² Thus, the initial study’s neglect of the socioeconomic patterning of selection bias “resulted in a failure to identify potential etiologic leads.”⁶² One can only wonder how epidemiologic knowledge would change if every study were able to compare and adjust for the sociodemographic characteristics and life experiences of the participants and nonparticipants.

Consequently, far from being a “nuisance” issue, the social patterning of who is and is not in our epidemiologic studies has major implications for etiologic analysis. By definition, the people we study are simultaneously social beings and biologic organisms^{16,40,41}—and we risk serious error if we attempt to study the latter without taking into account the former.

CONCLUSION: SOCIETAL RELATIONSHIPS AND PROCESSES OF IMPOVERISHMENT ARE THE CONTEXT OF EPIDEMIOLOGY

The voices and self-reported experiences of the poor—and not just renditions of their lives by “outsiders”—are essential.^{25,32–34,65–67} However, epidemiology’s concern cannot simply be about “the poor.” A comparison group is needed. By analogy, were we to study the impact of smoking on the health of smokers alone, we would be able to ascertain only the differential exposure and susceptibility among the exposed, rather than the impact of exposure versus no exposure.⁶⁸

More profoundly, the “poor” do not exist in isolation—they are as integrally a product of the workings of each society’s political economy as any other economic group, including the wealthy.^{13–17,25,32–34,69} The “poor” are not “the problem”; rather, the problem lies in the societal relationships and processes leading to and perpetuating impoverishment. Health inequities are created by unfair and unjust policies and practices that preferentially reward certain groups, economically and socially, at the expense of others.^{12,70} A corollary is that unfair relationships between groups shape characteristics of the groups themselves, including their health status. That is, group properties can arise because of relationships among groups, not because these characteristics are somehow “innate.”^{26,70} Mistake one for the other, and the causal arrows will point in the wrong direction.

This is why social relationships are at the crux of Peter Townsend’s 1986 classic article “Why are the many poor?”⁶⁹ This commentary was concerned with persistent socioeconomic and health inequities in the United Kingdom, and followed the famous UK *Black Report*,⁷¹ which Townsend coauthored and which put health inequities on the map for our generation.^{11,12,40,41} As argued by Townsend, it’s not simply that there are rich and poor; rather, there are rich because there are poor.⁶⁹ To achieve health equity, Townsend concluded, “The only long-term remedy is to restrict the power and wealth of the rich, to dismantle the present structures of social privilege, and to build social institutions based on fair allocation of wealth and on social equality.” These are testable propositions. It is long past time to alter the equation linking poverty and poor health. In its place, and consonant with our discipline’s deep roots, let me propose: social justice + human rights = health equity.

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