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## Response to Davis and Stainthorpe - 2

Terry Boychuk  
*Macalester College*

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## Response

Terry Boychuk

Professor Davis's essay reminds us of the potential contributions of epidemiologists and other public health researchers to our understanding of the consequences of economic development. Generating credible evidence about the health of populations in a rapidly evolving global order is a daunting task. Health scientists face staggering complexities as they seek to identify the social, chemical, biological, and other factors implicated in the spread of disease. The gap between what we need to know in order to address pressing health issues and what we do know is wide indeed. The existing knowledge base is sufficiently variable to lend credence to both optimistic and pessimistic descriptions of present health trends. We need better information to steer intelligently the formation and implementation of new health policies. Specifically, policymakers require more definite answers to this question: What importance should we attach to public health measures within the greater constellation of factors presumed to influence health and well-being?

Much of the debate about the future of public health is a dispute over the lessons of the past. If we cannot predict with much certainty the value of public health efforts to present and future generations, let history be our guide. Thus, interpretations of the gains associated with public health movements in the nineteenth and early twentieth centuries figure prominently in arguments for devoting more resources to identifying and mitigating the environmental causes of illness and death. If you believe, as Davis does, that the great advances in health status between the mid-nineteenth century and the mid-twentieth century primarily stem from better sanitation, then cleanliness is the key to preserving our good fortune and to registering further progress. Davis laments the heavy emphasis placed on biomedical approaches to health promotion in recent times, as well as the preoccupation in contemporary public health research with individual lifestyle choices that influence health. Arguably, the former begets expensive and largely ineffectual therapies for preventable conditions. The latter represents the abdication of a time-honored responsibility. The historical role of the public health profession is to keep a constant watch for emergent threats to health in our changing environment. The various studies fea-

tured in Davis's essay all represent an attempt to return public health research to its original moorings.

In principle, Davis's major assertions are sound. First, industrial production creates an enormous variety of toxins, so many that the proliferation of these hazards may outstrip the capacity of public health agencies and other branches of the health sciences to assess their threat to humans specifically and to the ecology of the planet generally. I agree that maintaining public health requires eternal vigilance. Second, if we devote more resources to understanding public health issues then we can heighten the sense of urgency about good environmental policy, in part by joining it to emergent research on global climate change. Melding findings on the immediate and long-term threats to human life from industrial pollutants is a worthy objective.

I do wish to elaborate further, as well as qualify, the critique of the biomedical model of disease in Davis's essay. Further, I revisit the debate over the contributions of early public health movements in light of new research that has transformed our understanding of the nature of disease. These discussions offer a framework for assessing the importance of renewing our investments in public health.

How shall we evaluate the relative value of public health measures and modern medicine? Davis asserts that:

[P]ublic health gains were originally caused by some basic improvements in sanitation, not the individually based treatments... As the burden of disease shifts from traditional hazards such as infectious disease and accidental injury to modern ailments such as cancer, asthma, neurological disorders, and heart disease, the individualized medical approach that we so admire becomes less and less functional. These conditions arise from social and economic factors that cannot be controlled by individual behavior, and therefore, individualized treatments are not sufficient.

In other words, we cannot attribute much of our health gains to medical care. I agree. In the developed world, the rise of modern life expectancy predates the Cold War. It is the last fifty years that have witnessed dramatic, unprecedented, remarkable, and costly advances in medical knowledge and treatment. In the United States, average life expectancy increased from approximately 42 to 68 years between 1850 and 1950. It now stands just above 76 years. Age-adjusted deaths from cancer, for example, have remained relatively stable in the last half-

century notwithstanding enormous investment in medical treatments for this life-threatening illness. The evidence cuts two ways, however. The postwar era also witnessed far-reaching efforts to reduce air and water pollution, eliminate industrial hazards in the workplace, reform building codes and remove toxic substances from building materials, regulate food and drugs, and improve consumer product safety. Medical innovations and bolder environmental policies appear to yield comparatively minor extensions of longevity in recent times. Not surprisingly, charting individual health risks has now assumed a central place in current debates over the incidence and prevalence of chronic diseases. Diet, exercise, and drug habits have become the most favored explanations of health status among researchers and in the popular imagination. Academics vigorously pursue media coverage of their latest health discoveries about nutrition, physical fitness, and smoking and alcohol use.

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The role of the acute care system is largely palliative, not curative. Medical care generally improves quality of life, not quantity of life. Diagnosis of ailments, relief of pain and suffering, and therapies that moderate the debilitating effects of chronic illnesses account for the great majority of health care expenses. Most of the remedial work of medicine does not reverse life-threatening conditions. Should we then divest the health care industry of its massive endowments? The case for preserving the largesse of the medical establishment can rest on any number of arguments. One is that massive, sustained investments in medical knowledge and techniques may eventually produce cures for heart disease, stroke, cancer, and other major causes of death. Another is that we have reached a point of rapidly diminishing or vanishing returns to investments in disease prevention, and as such, steadily rising funding of medical services represents an appropriate response to enduring health problems. Public health advocates commonly invert these arguments. They take a less optimistic view of the potential for medical interventions to restore failing health in the long run and see abundant opportunities to reconstruct human ecology in ways that preempt chronic afflictions.

These divergent interpretations of the available evidence draw our attention away from the shared assumptions that unite these two branches of health promotion. To the greater extent, allopathic concep-

tions of disease inform both medical and public health sciences in the U.S. The conceit of allopathic medicine is that we can overcome our inherent biological limitations and reverse basic degenerative processes with local, highly specific interventions *within* the body. Taken to its logical extreme, reconstruction of the human genome will, in time, substantially alter our natural tendency to fall prey to illness, to age, and to die. The conceit of allopathic public health is that we can overcome our inherent biological limitations and reverse basic degenerative processes with local, highly specific interventions into the material *surroundings* of the body. Taken to its logical extreme, reconstruction of human environments to remove insults to the body from without can substantially alter our natural tendency to fall prey to illness, to age, and to die. Both views presuppose human frailty, commonly overlook the body's innate regenerative capacities, and overemphasize the physical as opposed to sociocultural dimensions of health and illness.

Public health researchers generally inflate the contributions of sanitation to human longevity. This misapprehension stems from the observed correlation between advances in public sanitation in the late nineteenth and early twentieth centuries and the rapid decline in deaths from infectious diseases in the same interval. Did the former cause the latter? The affirmation rests upon two empirical claims. The first is that these public health measures successfully removed the broad spectrum of potentially lethal agents from human environments. The second is that clean environments uniquely produce healthy populations. Both claims are debatable. In the first instance, disease-producing bacteria and viruses are ubiquitous. Public sanitation does remove various infectious agents from some mediums, but leaves untouched the vast majority of virulent organisms present in other common sites of disease transmission, such as human-to-human contact. Because mortality rates for all infectious diseases in both controlled and uncontrolled mediums fell precipitously during the same period, public health measures cannot account for the general decline in infection-related deaths. As for the second case, human immune systems develop through constant exposure to infectious agents. It is this knowledge that inspired the widespread use of childhood inoculations. Immunology has made remarkable strides in the past two decades, largely in reply to the AIDS crisis. These advances increasingly point to the body's immune response to contagions, rather than

the presence or absence of virulent elements, as the decisive factor in the spread of most communicable diseases.

How do we then explain the steep drop in mortality rates from infectious diseases, the rise of modern life expectancy, and the associated prevalence of chronic illnesses of longevity? The question is best answered when phrased in demographic terms. Who dies less often? Great advances in life expectancy largely stem from falling mortality rates among infants, children, and young adults in modern times. Why do children thrive in the new milieux of urban, industrialized societies? Broad evidence suggests that the reconstruction of the family generates new emotional, intellectual, and economic investments in the lives of children that make them highly resilient in the face of disease. The social transformation of marriage, parenting, household labor, education, and other aspects of family life offset the natural vulnerabilities of children's immune systems.

The transition from preindustrial to industrial economies radically alters domestic life. Agrarian householding economies favor reproductive strategies that do not augur well for infants and children. The labor of children is a prime economic asset, and the preference for quantity, not quality, is evident. Large sibling cohorts prevail. Infant mortality is common. Modern parenting inverts the logic of procreation in agrarian households. Rather than spreading fewer resources across many children, urban families devote more resources to fewer children. In the long run, urbanization and industrialization produce new opportunities for women to receive advanced education and to participate in the paid labor force, delay initiation into marriage and motherhood, beget widespread use of contraception, and reduce dramatically the number of children born to individual women while extending the interval between births. Modern children enjoy several advantages over their agrarian ancestors: less emotional and physical neglect, more intellectual stimulation, better schooling, and little exposure to the hazards of productive labor. The advent of intensely nurturing and protective styles of parenting makes for children who demonstrate comparatively robust immune systems. The omnipresent threat of infectious disease no longer generates high mortality rates among infants, children, and adolescents.

Global demographic shifts largely confirm the relationship between fertility rates and health status. In 1950, the world's population stood at one billion. Today, it exceeds six billion. After 2050, it may stabilize at 11 – 12 billion, if current predictions hold. The six-fold increase

between 1950 and 2000 coincides with falling, not rising, birth rates. The average number of children born to women in developing countries declined from over six to just under three. Raising fewer children, most of them surviving to adulthood, accounts for the tremendous gains in life expectancy and for the large increase in global population.

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We cannot look to the battle against infectious diseases to furnish us with an historical mandate for renewing our commitments to public health. Obtaining sound knowledge about the effects of industrial contaminants does not have an obvious parallel in the study of organic contagions. That current evidence is so fragmentary and inconclusive should provide ample justification for greater investments in more comprehensive surveys of chemical hazards. Enumerating synthetic compounds and industrial by-products not already evaluated for their harmful effects would represent a welcomed first step in the direction of cataloging these potential risks, and subsequently, it would better focus public health research. We should also keep in mind that the contemporary origins of good health are rooted in the most basic social processes of human reproduction, namely, marriage and child rearing. These are significant elements of much broader social transformations growing out of industrialization and urbanization. We must maintain our social investments in children to reap the health benefits of economic development.

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