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Response to Davis and Stainthorpe

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I found Professor Devra Davis's presentation thought provoking. Her essay is effective at challenging the individualized approach to health that dominates modern medicine, and calling for a wider, population-based approach. This need to address public health concerns is demonstrated in the second part of her essay. However, her caution while still linking correlation and causation in the studies she cites is indicative of the complexities of understanding and addressing the processes that are damaging human health. In the third section, Davis briefly comments on the implications of the arguments she presents, opening the door for analysis of suitable policy responses.

I would like to explore how the policy-making process both accommodates and hinders the implications of Davis's paper. I will do so by responding to the three sections of this essay, first agreeing with the need to further develop the domain of public health, adopting policies that ensure communal safety. Second, I will comment on the challenges inherent in the environmental policy-making process, focusing on three aspects: The formulation of problems and suitable responses; the challenges of approving, enacting, and implementing environmental legislation; and assessment of other barriers to improving environmental health. As I comment on this aspect, I will reflect upon the need for ongoing dialogue between scientists and policymakers, and the difficulties of working with incomplete information and relative uncertainty. As I comment on the policy-making process, I will illustrate the need to build public awareness and elucidate key political and economic sources of resistance to environmental legislation. Finally, I will conclude by expanding on the suggestions introduced in the last section of Davis's essay, challenging her to discuss the implications of her arguments.

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Davis made the case for enhancing public health policies. Her assertions are solid, as she argues, for example, that adopting greenhouse gasses mitigation technologies in four cities (Sao Paulo, Brazil; Mexico City; Santiago, Chile; and New York City) would avoid some 64,000

premature deaths, 65,000 chronic bronchitis cases, and 37 million person-days of restricted activity or work loss.

The question, therefore, is not whether societies across the world would benefit from improving their local and global environment, but remains focused on the challenges and drawbacks of policies aimed at doing so. Environmental regulations obviously have costs, which mainly affect economic production and development, and consequently reflect on other components of quality of life. Similarly, devoting resources to particular regulations might imply leaving other policies unaddressed. So, the relative weight of various problems needs to be considered when formulating and enacting policy decisions.

Moreover, the policy-making process is filled with obstructions. In both developed and developing countries, what constitutes a good policy is different from what is usually effectively implemented. The reasons for this discrepancy vary in their relative importance according to local political settings, but are related to the complexities of the policy-making process and implementation mechanisms, the strength of interest groups in proportion to dispersed beneficiaries, awareness and availability of information, corruption, and politico-economic constraints. Sound environmental legislation ought to balance the multiple benefits of environmental quality—including human health—with its costs, primarily consisting of constraints on economic growth. However, in practice, public awareness, political support, and cost of compliance with regulation have been key determinants in the extent to which policy goals are met.

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Scientists' works identify and explain the effects of environmental degradation on human health. It is thanks to the information that scientists provide, through studies like the one presented by Davis, that policymakers are informed and encouraged to respond. Therefore, an ongoing dialogue between academia and government is fundamental in order to advance innovation in legislative regulations to protect human health. In this respect, Davis's credentials in both the scientific and the governmental sectors should encourage many scientists to actively pursue the implementation of their findings through close cooperation with governmental agencies. This dialogue to implement scientific recommendations makes apparent the difficulties of putting

theory into practice. The main challenges are how to overcome funding limitations, and how to work with incomplete information.

A vicious cycle hinders efforts to address detrimental environmental conditions. Studies of unapparent trends that are not well publicized receive little funding, which results in inconclusive knowledge about those phenomena. This, in turn, fails to appeal to public attention or governmental concern, which ultimately leads us back to square one, leaving those phenomena ignored and underfunded. In other studies, like most of those mentioned in Davis's essay, the vastness and complexity of the problems at stake have a tendency to yield incomplete information. Because epidemiological analysis tends to prove correlation rather than causation, relationships between environmental hazards and human illnesses are suggested, rather than identified and described with certainty. Davis comments on this as she asserts: "the complex developments in society that are underway make it difficult to pinpoint precise causal connections between these developments and specific health consequences."

This degree of caution and skepticism while establishing links is important in scientific studies, and is indicative of a professional attitude. However, it becomes highly problematic for policymakers, who demand precise information in order to act, and feel complete knowledge is crucial to professional policymaking. Legislators ask scientists for clear causation links, for certainty in the effects of responses, for safety thresholds of admissible pollution levels, for calculable risks of potential hazards, and so on. However, even in the hypothetical situation of unlimited funding for research, the extent to which this information can be provided is limited. If passing environmental legislation when there is clear causation links and overwhelming evidence is already complicated, achieving such goals when working with more vast, more complex phenomena, and imperfect information, is exponentially more so. First, it is because opponents can more easily generate dissent. Secondly, policymakers are wary of allocating resources to less evident, and consequently conceived as less pressing, issues, particularly when there are many items vying for a place in their agenda.

The place and priority of competing policies depends less on scientific logic than on political circumstance and feasibility. Environmental theorist Rosenbaum argues that "[o]ften, the losers are scientifically compelling environmental problems unblessed with political sex appeal."[1] This means that major problems are neglected, to a large

extent, precisely because of their dimension and nature, which make certain, well-delimited findings an unachievable objective.

Though it is impossible to be secure from all uncertainties, it is nonetheless extremely dangerous not to act when information about hazards is incomplete. It is for this reason that the United Nations adopted the Precautionary Principle in the Rio Declaration on Environment and Development in 1992. Principle 15 of this declaration affirms that "[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[2] The figures provided by Davis, which show that thousands of deaths and chronic ailments are being caused yearly by a limited number of pollutants, are indicative of the pressing need for action to both regulate and study the effects of pollutants.

In short, further studies are needed. In the United States, the nation where most research is currently undertaken, the Environmental Protection Agency (EPA) has analyzed only a small number of the chemicals within its regulatory jurisdiction, and though little information is available, the effects of many of those pollutants are thought to be detrimental to human health. Most other countries conduct their policies with greater degrees of ignorance and neglect of environmental hazards. Moreover, there are multiple lacunas in our understanding of the relationship between exposure to pollutants and contraction of disease, and the effect of pollutants in different population groups, which exhibit different sensitivities. Along these lines, Bryner argues that:

> not much is known about the synergistic or interactive effect of exposure to a variety of potentially harmful substances . . . These are chemicals for which no ambient air quality standard has been developed and that are determined by the EPA to reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness.[3]

Under these circumstances, cost-benefit analysis is misleading. Studies provide a relative sense of certainty as economists calculate the expected damages from unknown pollutants by weighting the damages from a range of possible scenarios by probability that the hazards will occur. The Industrial Waste Air Model (IWAIR) used by the EPA is a good example of how this is done, as it shows how 95 chemicals are used to determine air conditions and hazards. However, since so

many pollutants are not included in these studies because their effects are unknown, the sense of understanding and researched knowledge brought about by this model is particularly dangerous, as it eliminates the skepticism and caution with which such findings should be understood.

Relative uncertainty also distorts the ordering of the government's regulatory priorities. When the relative feasibility and appeal of policy responses obscures the relative importance of hazards, it becomes hard to discern serious from trivial threats. Incomplete data force senior agency officials to make regulatory decisions "based on risk assessments in which scientific findings cannot be readily differentiated from embedded policy judgments. [It is not unusual that this would result in] extremely conservative biases and do not provide decision makers with the information they need to formulate an efficient and cost-effective regulatory strategy."[4] If estimates are guided by political constraints as much as by scientific analysis, then the effectiveness of policies seeking to address the problem is obviously diminished because scientifically decided thresholds could be shifted. This means that, ultimately, it is the political process, and not scientific evidence, that determines how much pollution to tolerate. This brings us back to the need for greater cooperation between scientists and policymakers. Politically active scientists are needed to confront the reshaping of pollution thresholds during the policymaking process, aggressively lobbying to encourage legislators to abide as much as possible by scientific findings and recommendations.

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In regard to the intricacies of approving, enacting, and implementing legislation, multiple problems arise. Public support is key to successfully establishing any policy. Setting aside corruption issues and other aspects of idiosyncratic politics, legislators ultimately respond to the concerns of their constituents. Consequently, those hazards that are not widely known have tremendous difficulties establishing themselves in policymakers' agendas. Building public awareness is crucial to regulating any environmental problem. A change in perspective in laymen's understanding of health problems is needed to place environmental health as a core concern.

Davis's essay is effective at inducing people to frame health problems through a holistic paradigm that encompasses the effects of envi-

ronmental pollution on our biological functioning. This is important because if people are aware that pollution is largely responsible for their reproductive disorders, respiratory and neurological diseases, asthma, and cancers, they are a lot more likely to advance a regulatory agenda for a healthier environment. The current popular understanding of these diseases stresses genetic transmission, or unexplainable, random phenomena, and rarely links them to environmental pollution. However, if these diseases are understood as such, the general public, and ultimately policymakers, will be more responsive and active in the fight to make industries cleaner, and the local and global environment healthier. Moreover, if communities believe that the industries' externalities are being paid for by their medical problems and costs, they will be more inclined to take drastic action to regulate those industries. But this paradigm is rarely used. The effects of local air pollution on human health are rarely present in media and governmental agendas. This has been overwhelmingly clear in the response of the United States government to global climate change, and media representations of it. The report, compiled by the Committee on the Science of Climate Change of the National Research Council (*Climate Change Science: An Analysis of Some Key Questions*), which has guided the decisions of the Bush administration on this subject, has no mention of the local, contemporary, hazardous effect of the gasses that are causing global warming. This is particularly stunning because the Institute of Medicine of the National Academy of Science is one of the contributors to that report. The deaths that are occurring due to greenhouse gas emissions were not computed into the cost-benefit analysis performed by the Bush administration at the time of explicitly declining to participate in the Kyoto protocol.

Similarly, media coverage of international negotiations on global climate change has been high, however the effects of these very same pollutants at a local level have rarely been commented upon. Davis makes an effective argument as she adds a local dimension to this discussion, highlighting the pressing need to regulate these gasses. Such an initiative obviously has a higher chance of success in the policymaking process if there is greater awareness that these emissions are already jeopardizing human health in those very same cities where they are occurring. This argument is remarkably powerful if we consider that legislatures usually lack enthusiasm to tackle problems in the absence of a crisis, or a present, or near future, tangible problem.

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A variety of other factors generate resistance to expanding environmental regulations to enhance public health. Among others, corporate power, incentives to maintain the current individualized approach to health care, and politico-economic contingencies have important impacts. The cost of incremental environmental clean-up is exponentially more expensive, which is why governments are reluctant to pursue further regulations. Comprehensively addressing the problem of air pollution is an expensive initiative, which will be highly contested by those who will pay for it.

In countries where the state provides health services, some of the costs of implementing environmental health-related legislation will be covered by reductions in treatment to heal these diseases. There would be a shift of resources from healing to preventing these chronic ailments. However, this does not make establishing such policies any easier, as resources do not transfer easily across governmental organizations and generations of recipients. In countries where the public sector does not cover the cost of health services, convincing individuals that their money is better utilized cleaning up the environment than paying for medical treatments in the future is a greater challenge.

The strength of interest groups in relation to dispersed beneficiaries, who are often ignorant of the risks to which they are exposed, is a major difficulty environmental health proposals will encounter. Mobilizing public support to override the power of corporations interested in maintaining the status quo is a significant challenge. Moreover, the health care industry currently benefits from an individualized approach to medicine in which they sell their products and treatments. A more preventative approach would not be profitable for them. Therefore, they do not have incentives to advance the public health agenda, and their reactions to such initiatives are not yet clear.

Developing countries face a particular challenge as they try to protect their populations' health, constrained by minimal resources, poor governance structures, and the pressures of globalization and neo-liberalism. For communities undergoing developmental transitions, protecting their own health sometimes appears as a luxury in the midst of immediate priorities. Protecting the health of future generations and environmental justice are even less pressing policy concerns.

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Environmental quality is increasingly viewed as a precondition for healthy, sustainable economies and societies. A Swedish engineer emphasized this view, affirming that "[w]e treat nature like we treated workers a hundred years ago. We included then no cost for the health and social security of workers in our calculations, and today we include no cost for the health and security of nature."[5] Redressing environmental problems that cause diseases is pressing, as good health is essential for all other aspects of human life. Davis presents this argument, linking environmental pollution and chronic ailments, and calls for greater public health policies.

Agreeing with her view, I have elucidated the challenges that Davis's recommendations face in the policy-making process, due to the complexities intrinsic to this process, the problems inherent in working with incomplete information, the role of public awareness, and other factors that obstruct the formulation and implementation of sound environmental public health policy. The addition of this more detailed analysis of the challenges faced by Davis's suggestions reiterates with greater strength the need to further research environmental hazards to human health, and to more actively advance public policies to reduce the presence of agents suspected of exacerbating chronic ailments. Moreover, greater cooperation between scientists and policymakers and building public awareness about environmental hazards have also been proven crucial.

I would appreciate it if Davis further comments on the brief recommendation section of her essay, describing how she expects her findings to be utilized, how she will advance her political agenda, what are the challenges she encounters, and how she plans to overcome them. I would also like her to discuss how to use her epidemiological data in cost-benefit analysis use to prioritize policies. Moreover, I would like her to expand on how she plans to carry out her political agenda, and on why she considers environmental health such a key question in a world with so many major, pressing problems.

Notes

1. Rosenbaum, 131.

2. The Rio Declaration on Environment and Development, 1992, p. 3.

3. Bryner, 53.

4. Regulatory Program of the United States Government, 1990–91, p. 14.

5. Quoted in Bryner, 17.

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