

Epidemiology Publish Ahead of Print

DOI: 10.1097/EDE.0000000000000624

Science, Politics, and Health: EPA at the threshold

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Prof Schwartz was a recipient of a John D and Catherine T MacArthur Fellowship.

Conflict of Interest Statement: Dr. Schwartz has received research grants from the U.S. Environmental Protection Agency and the National Institute for Environmental Health Sciences. Those grants are awarded based on recommendations from outside peer review panels. Dr. Schwartz has testified on the health effects of air pollution in law suits brought by the U.S. Department of Justice.

The United States Environmental Protection Agency (EPA) was founded in 1970 with bipartisan support and under a Republican president, Richard Nixon. The central laws authorizing it to protect the health of U.S. residents from pollution (the Clean Air Act, the Safe Drinking Water Act, etc.) similarly enjoyed bipartisan support. Beginning in the 1980s this began to change, with increased ideological opposition to regulation. In the 1980s that opposition focused on arguments that the costs of pollution controls were not justified by the modest health impacts produced. This opposition was generally accompanied by the argument that more science is needed. However, by the late 1990s these arguments became untenable, because the science had been done, and the impacts were not modest.

First PM_{2.5} and more recently ozone have been shown to be associated with substantial health risks; these include early deaths, myocardial infarctions, and hospital admissions for pneumonia, heart attacks, and stroke show similar associations.¹⁻⁶ The estimated attributable health impact is large. Using dose-response curves vetted by EPA's Science Advisory Board, Fann et al. estimated that PM_{2.5} was associated with 130,000 early deaths in 2005, 180,000 nonfatal myocardial infarctions, and 2.5 million asthma exacerbations.⁷ The associations in the epidemiology studies used have been replicated in dozens of cohort studies and hundreds of time-series studies across the world. The World Health Organization has used them in the Global Burden of Disease estimates, reporting over 5 million of early deaths per year due to these pollutants⁸. The Royal College of Physicians similarly estimated 40,000 deaths per year in the United Kingdom due to air pollution⁹.

A large number of toxicology and controlled human exposure studies showing associations of these pollutants with changes in intermediary outcomes (blood pressure, inflammation, autonomic function, endothelial function, thrombosis, oxygen uptake, etc.) provide support to

those findings.¹⁰⁻¹⁷ Similar results have been reported in panel studies of humans¹⁸⁻²². A double-blinded study using true vs. sham particle filters in residences demonstrated that lowering particle levels decreased inflammatory markers and increased methylation of pro-inflammatory genes²³. More recently, causal modeling methods have added to the evidence^{24, 25}. This body of evidence is too large to be reviewed here, but it has been reviewed by expert scientific committees convened by multinational (e.g. the World Health Organization, the UN Environment Program, the European Union) as well as national governments, such as the United Kingdom, and EPA's own external Clean Air Scientific Advisory Board. All these review groups, as well as major medical organizations such as the American Heart Association, the American College of Cardiology, etc. have supported the scientific consensus that these are causal effects^{8, 26-36}.

This scientific consensus is at odds with political beliefs that place centrality on not limiting the behavior of people or businesses except under extreme circumstances. Groups who hold these beliefs can only resolve this conflict by attacking the science and, when that fails, attacking the enterprise of science itself.

The International Society for Environmental Epidemiology is deeply concerned by the prospect that Scott Pruitt—a person who seems to hold these anti-science beliefs—has been nominated to head the EPA, the very agency that sets environmental health standards based on science. As Attorney General of Oklahoma, Scott Pruitt dissolved the branch that dealt with enforcing environmental regulations and replaced it with a “federalism” branch, which has sued EPA over almost all major air pollution regulations³⁷. He advocates a policy of leaving such decisions to states, despite the knowledge, obvious to anyone who has watched a weather map on the evening news, that air travels great distances, and pollution with it.

When his appointment was announced, Mr. Pruitt stated that ““The American people are tired of seeing billions of dollars drained from our economy due to unnecessary EPA regulations, and I intend to run this agency in a way that fosters both responsible protection of the environment and freedom for American businesses.”⁴⁰

However, based on the lawsuits that he has brought against the EPA in his term as Attorney General of Oklahoma, the regulations he dislikes, far from being “unnecessary”, are essential for protecting human health. Indeed, they have saved over 10,000 lives per year since their implementation. These include the cross-state air pollution rule, the primary driver of recent reductions in PM_{2.5} in the US⁴¹, and the Mercury and Air Toxics rule, which has also reduced particle concentrations in the air as well as mercury in seafood³⁸. Moreover, rather than being a drain on the US economy, these rules have economic benefits that far exceed their cost. For example, the Regulatory Impact Analysis for the Cross State Air Pollution rule found economic benefits were more than 100 times the costs⁴². Importantly, the methodologies and economic analyses that reach those conclusions were reviewed by an external panel of internationally known environmental economists, and the health effects they were based on were reviewed by an external panel of similarly distinguished experts in environmental health^{33, 39}.

To justify their objections to environmental protection rules, conservatives assert that the “health evidence is weak”⁴³, that failure to release medical records of study participants to industry groups means EPA relies on “secret science”⁴⁴, and that allowing scientists with expertise on environmental health to serve on review committees is a “conflict of interest” since they are “reviewing their own studies⁴⁵” (although each member of the Clean Air Scientific Advisory Committee has written only a small percentage of the thousands of papers reviewed). The US House of Representatives has even passed a bill that states “Board members may not participate

in advisory activities that directly or indirectly involve review or evaluation of their own work” while allowing industry scientists with true conflicts of interest to take part in the review (“persons with substantial and relevant expertise are not excluded from the Board due to affiliation with or representation of entities that may have a potential interest in the Board’s advisory activities”)⁴⁵. Moreover, scientists who have received grants are prohibited from serving on EPA’s Scientific Advisory Board, which would exclude essentially all non-industry funded independent scientists with expertise in relevant areas.⁴⁵

Increasingly, attempts are being made to reduce funding for science and for the scientific review apparatus that keeps producing what conservatives view as undesired results. A recent attempt to cut funding for the International Agency for Research on Cancer (IARC) and calls for reducing EPA’s research budget are examples. These attempts are also accompanied by personal attacks on scientists. The House Science Committee recently criticized EPA, stating that “The committee has also determined that EPA officials maintained a close relationship with activist IARC participant Christopher Portier”⁴⁶. From this description one might think EPA conspired with a wild-eyed environmentalist. In fact, Dr. Portier is the former Director of the National Center for Environmental Health at the Centers for Disease Control and Prevention (CDC) and former Director of the Agency for Toxic Substances and Disease Registry. Prior to CDC, Dr. Portier was Associate Director of the National Institute of Environmental Health Sciences. These are the same types of attacks used to attack climate scientists and to create the impression of uncertainty around the earth-warming effects of human emissions of CO₂ and methane; in a May Editorial in the National Review, Mr. Pruitt stated “Healthy debate is the lifeblood of American democracy, and global warming has inspired one of the major policy debates of our time. That

debate is far from settled. Scientists continue to disagree about the degree and extent of global warming and its connection to the actions of mankind⁴⁷. “

Mr. Pruitt’s campaign and an organization of like-minded state Attorneys-General he helped to found raise considerable funds from companies that make similar statements, and oppose pollution control regulations. He recently sent a letter written for him by an oil company to EPA, complaining about estimation of pollution from oil wells⁴⁸. In another letter, he asked the Inspector General of EPA to stop the agency from investigating the possible impacts of fracking on drinking water⁴⁹, which suggests he favors a policy of “don’t look and you won’t find a problem.” This year he sued the agency to overturn a regulation of methane emissions from new equipment used at oil and gas wells⁵¹.

Pruitt’s background and record make him an inappropriate choice for leader of an agency tasked with protecting human health and the environment and, indeed, ensuring that the United States is a leader in protecting the global environment. The International Society for Environmental Epidemiology therefore urges the President-Elect to withdraw Pruitt’s nomination or the U.S. Senate to reject the nomination.

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