AIR POLLUTION

Panel Backs EPA and 'Six Cities' Study

The Environmental Protection Agency (EPA) has won a major victory in the fierce battle over its tough new standard for particulate air pollution. Dealing a sharp blow to critics from industry, a nonpartisan research group has reevaluated key data that EPA relied upon to set that standard and has come out firmly behind the agency. Although all scientific debate isn't over, the reanalysis "puts to bed many of the concerns that were raised" 3 years ago, asserts John Vandenberg, an EPA environmental scientist.

At issue was EPA's 1997 decision to extend its regulation from particles 10 micrometers or less in size to those a mere 2.5 micrometers or less across ($PM_{2.5}$). EPA based its decision largely on two controversial studies that linked these tiny particles, released mainly by motor vehicles and power plants, to higher death rates.

In the Six Cities study, Harvard researchers examined the relation between levels of PM and sulfates (a component of fine particles) and death rates among more than 8000 people in six U.S. cities, following them for 14 to 16 years. The American Cancer Society (ACS) study followed over 500,000 people in 154 cities for 8 years. Both found a slight rise in death rates from heart and lung disease in cities with higher levels of $PM_{2.5}$, although the mechanism remained unclear. Based largely on the ACS death count, EPA calculated that the benefits of cutting $PM_{2.5}$ to 65 $\mu g/m^3$ over 24 hours would far outweigh the multibillion-dollar costs.

After EPA proposed the standard in 1996, the American Petroleum Institute (API) and other industry groups blasted the two studies. Some scientists also argued in congressional hearings that the apparent link might result from other air pollutants, a less healthy lifestyle in dirtier cities, or other confounding factors. Industry groups sued to block the new regulations. A federal court decided that the science was sound but threw out the rules based on legal arguments, which will be heard by the Supreme Court this fall. At the same time, skeptical industry groups and some lawmakers demanded that the Harvard researchers turn over their raw data. The researchers refused, saying that subjects' confidentiality would be breached.

To resolve the scientific and data-sharing issues, Harvard turned to the nonprofit Health Effects Institute (HEI) in Cambridge, Massachusetts. HEI assembled an expert panel to reanalyze both studies. In a report released last week, that panel concluded that the association between $PM_{2.5}$ and excess mortality is real. The team, led by statistician Daniel Krewski of the University of Ottawa, replicated the studies from original data sets and got essentially the same results: slightly higher death rates in the dirtier cities (see table). The team probed the data for more than 30 possible confounders, from altitude to health services, and tested the link "in nearly every possible manner" with various analytical techniques. The results still held.

	Increase in $PM_{2.5}$ across cities	Increased Death Rate	
		Original Investigators	Reanalysis
Six Cities	18.6 $\mu g/m^3$	1.26	1.28
ACS	24.5 $\mu g/m^3$	1.17	1.18

Confirmation. Reanalysis yielded results almost identical to the original studies: a rise in death rate of 28% (in the Six Cities study) and 18% (in the ACS study) from cleanest to most polluted city.

Bill Frick, an attorney with the API, agrees that the reanalysis has "eliminated some of the uncertainty." Another major epidemiology study released by HEI that looked at daily PM levels and deaths in 90 cities has also cleared up earlier doubts (*Science*, 7 July, p. 22). But Frick argues that researchers still need to figure out which component of $PM_{2.5}$ causes harm and hence what problem needs to be fixed—power plants or diesel trucks, for instance. A slew of new federally funded research is addressing those questions and will feed into EPA's assessment of $PM_{2.5}$ science this fall. Until EPA decides whether to adjust the standard next year, it won't ask states to comply with the regulations.

Meanwhile, the legal scuffle over access to research data continues. In the wake of the controversy, Congress in 1998 passed a law, sponsored by Senator Richard Shelby (R–AL), mandating that federally funded researchers release their raw data if requested under the Freedom of Information Act. To the relief of scientific groups, the White House interpreted the law narrowly, limiting it to grants awarded after fall 1999 and only to data used to support regulations. The U.S. Chamber of Commerce threatened to sue to broaden that interpretation and began the process by filing requests last December for the Harvard data. So far, EPA has refused to turn over the data because the study predates the law. Keith Holman, an attorney with the Chamber of Commerce, says the group hasn't yet decided whether to litigate the case. **–JOCELYN KAISER**

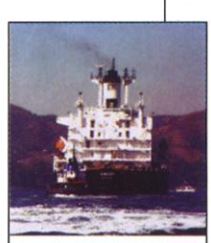
CREDITS: (LEFT TO RIGHT) HEI; BLUEWATER NETWORK

ScienceScope

Money and Management The chair of the House Science Committee, James Sensenbrenner (R–WI), is worried that the National Science Foundation (NSF) might receive too much of the first despite a shortage of the second. However, his desire to correct the perceived imbalance has stalled a bill to reauthorize NSF's programs.

Last week the committee announced that it would mark up H.R. 4901, a 3-year blueprint for NSF to replace one that expires next month. It's the committee's fourth stab this year at a reauthorization bill (*Science*, 2 June, p. 1564). But moments before the panel convened, Sensenbrenner pulled the bill, citing his failure to reach an agreement on how to respond to "ethical lapses at NSF." Sensenbrenner is incensed at the agency's response to a government finding that Luther Williams, former head of education programs, improperly accepted outside honoraria, and he has written into the bill a tough new ethics program. But Democrats and NSF officials believe the language is unnecessary. Sensenbrenner also objects to proposed language that would double NSF's budget over 5 years, saying it would undermine his panel's credibility with appropriators.

Going to Sea Drawing on research showing that supertankers and other big ships are a major source of air pollution (*Science*, 31 October 1997, p. 823), two California-based environmental groups are pushing the Environmental Protection Agency (EPA) to clamp down on the problem. Lawyers with the Earthjustice Legal Defense Fund are negotiating with EPA to settle a lawsuit that calls for tougher controls on seagoing vessels, the Bluewater Network said last week.



In a 17 July report (www.bluewaternetwork.org), the network notes that big ships typically use high-sulfur fuels that produce prodigious amounts of sulfur and nitrogen oxides and particulate matter. The lawsuit, filed last February on the network's behalf, challenges EPA plans to regulate the emissions through an international agreement. The groups say EPA's plan is unenforceable and would allow emissions to increase by 13% by 2030. EPA officials, however, predict that tougher U.S. rules would cause captains to sail to other ports to refuel.

Contributors: David Malakoff, Michael Balter, Jeffrey Mervis