Editor's comment: "Air Pollution and Health: Bridging the Gap from Sources to Health Outcomes"

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Published online: 15 February 2012
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Particulate air pollution is a worldwide threat to public health that was first recognized centuries ago. Decades of research following the air pollution disasters of the mid-twentieth century have provided an evidence base that has driven air quality regulations and management strategies. In high-income countries, including the USA and those of Europe, concentrations of particles have declined progressively. Nonetheless, even at the lower concentrations of more recent years, epidemiological studies continue to demonstrate adverse health effects; in many middle- and low-income countries, particulate matter pollution is increasing, consequent to rising numbers of vehicles, dense urbanization, and polluting industries. Consequently, there is an ongoing need for research that will guide air quality management strategies by identifying the particles and sources that pose risk to human health.

This issue of the journal includes papers from a conference held in 2010 by the American Association for Aerosol Research (AAAR). The conference, "Air Pollution and Health: Bridging the Gap from Sources to Health Outcomes," covered the full scope of research relevant to airborne particles—atmospheric sciences, exposures, toxicology and mechanisms, human health effects, and policy. Other interdisciplinary conferences have addressed this topic, including a 2003 AAAR conference and a colloquium series that began in the early 1990s. These conferences have proved to be invaluable to the scientific community by bringing together the broad range of researchers concerned with particulate air pollution.

This most recent conference also provided an opportunity for presentation and synthesis of evidence across disciplines. This issue includes an overview authored by Dr. Paul Solomon, the lead organizer, and his co-organizers. This lengthy summary is organized around eight "science questions" and an additional "policy" question. The questions reflect the toxicological framework, extending from sources to health effects, that has been used to guide research on airborne particles, since these have been incorporated in the research plan proposed by the US National Research Council's Committee on Research Priorities for Airborne Particulate Matter. The conference papers and the overview paper specifically provide a valuable "snapshot" of the state of the evidence on airborne particles and health. This synthesis of research presented at the conference shows that progress continues on these questions but uncertainties persist.

There has been vigorous and wide-reaching research on airborne particles over the last two decades since epidemiological evidence raised concern about ongoing risks from airborne particles, even though progress had been made in reducing ambient concentrations. Yet, as highlighted by this recent conference, substantial uncertainties persist. Researchers have been challenged by the myriad sources of airborne particles, the diversity of their characteristics, and the range of associated health effects. Increasingly elegant and multidisciplinary approaches are being used to address these challenges. Policy-makers and air quality managers eagerly await the findings of this work. This will not be the last comprehensive meeting on airborne particles; hopefully, ongoing research will continue to reduce major uncertainties. We congratulate Dr. Solomon and colleagues for organizing this valuable conference and bringing the findings to publication.

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