

Particles, air quality, policy and health

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Abstract: The diversity of ambient particle size and chemical composition considerably complicates pinpointing the specific causal associations between exposure to particles and adverse human health effects, the contribution of different sources to ambient particles at different locations, and the consequent formulation of policy action to most cost-effectively reduce harm caused by airborne particles. Nevertheless, the coupling of increasingly sophisticated measurements and models of particle composition and epidemiology continue to demonstrate associations between particle components and sources (and at lower concentrations) and a wide range of adverse health outcomes. This article reviews the current approaches to source apportionment of ambient particles and the latest evidence for their health effects, and describes the current metrics, policies and legislation for the protection of public health from ambient particles. A particular focus is placed on particles in the ultrafine fraction. The review concludes with an extended evaluation of emerging challenges and future requirements in methods, metrics and policy for understanding and abating adverse health outcomes from ambient particles.

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