EPA is right to revise small-particle pollution standards

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By Tami Davis Biddle and Thomas Y. Au

When we look back on photos, film and other imagery from the mid-20th century, we are often struck by the prevalence of cigarettes. Americans smoked; many smoked heavily. Smoking cigarettes was not only considered acceptable, it was considered appealing, attractive and cool. Then we learned better.

Scientific studies began to pile up more and more evidence, from the 1960s through the 1980s, indicating that smoking was directly linked to all kinds of negative health outcomes, most notably cancer. Public information, including government-led campaigns, helped us see the light.

While smoking is still a problem in the U.S., the prevalence of smoking is down dramatically. Today, our airplanes, restaurants, hotels and offices are fully or partially smoke-free zones. Indeed, to light a cigarette in one of those environments in America today often triggers the wrath of those around you.

In the second decade of the 21st century a similar groundswell of awareness is developing about the air around us. This groundswell, too, has developed gradually and is just now beginning to gain a head of steam. Once again it pertains directly to our health, and once again it pertains directly to the air we put into our bodies. This time, however, the focus is on air pollution and “fine particulate matter,” which is invisible and small enough to penetrate readily into human body tissue.

From the 1990s, scientific evidence has been piling up regarding the wide array of negative health effects of air pollution. And that evidence has pointed a particularly telling finger toward fine particulate matter, or PM 2.5 for short. It is well-established that exposure to air pollution increases the incidence of respiratory illness, including bronchitis and asthma.

Recent studies, including one run by the Columbia Center for Children’s Environmental Health, have drawn direct links as well between high levels of combustion-generated pollutants and high rates of infant mortality, low birth weight and cancer. In recent years, a direct link has been established between air pollution and cardiovascular illness. This link has been confirmed repeatedly in studies by scientists around the world. This problem is of concern in central Pennsylvania, where small-particle
If all this wasn’t enough to give us pause, researchers have begun to find strong linkages between PM 2.5 and two other dreaded health problems: stroke and cognitive degeneration. A recent study run by Gregory Wellenius of the Brown University Center for Environmental Health and Technology revealed that on days when concentrations of traffic pollutants go up, so, too, does the risk of stroke.

The increased stroke risk was highest within 12 to 14 hours of exposure to PM 2.5 and was most strongly associated with traffic-related pollution. Regarding the latter finding, the authors noted that “Experimental studies in humans and animals have shown that exposure to concentrated ambient PM 2.5 can induce increases in blood pressure and heart rate and reductions in heart rate variability within this time frame.”

What is perhaps most striking about this study is that PM 2.5 exposure increases the risk of ischemic stroke at levels below those currently considered safe under U.S. regulations. This observation prompted Dr. Rajiv Bhatia of the San Francisco Department of Public Health to suggest that ambient air quality standards should be reviewed. Bhatia argued that improved human control of PM 2.5 is “technically feasible, but will require increased efforts to assess exposure at the community level, more stringent and creative regulatory initiatives, and political support.”

In a study with equally daunting ramifications, Jennifer Weuve of the Rush University Medical Center in Chicago found women with higher levels of long-term exposure to coarse and fine particulate matter (PM 2.5) had significantly faster declines in cognition than those with less exposure to pollutants. Weuve and her colleagues found evidence that fine particulate can penetrate the brain through the nasal passages. Her study followed 19,409 women in the U.S. between ages 70 and 81 for about a decade, looking at cognitive changes every two years.

All of these studies have significant ramifications for national health policy and regulatory policy in the United States, suggesting stronger efforts to control fine-particle pollution might be needed to protect the general population. These studies should be in the forefront of the public debate as the Environmental Protection Agency considers whether to raise the standards for fine particulate.

Tami Davis Biddle and Thomas Y. Au are members of the Clean Air Board of central Pennsylvania.