American Academy of Pediatrics • American Heart Association
American Lung Association • American Public Health Association
American Thoracic Society • Asthma and Allergy Foundation of America
Trust for America's Health •Healthcare Without Harm
National Association of City and County Health Officials

July 1, 2013

Acting Administrator Robert Perciasepe
U.S. Environmental Protection Agency
Air and Radiation Docket and Information Center (6102T)
1200 Pennsylvania Avenue NW
Washington, DC 20460

RE: EPA-HQ-OAR-0135-2011, Tier 3 Motor Vehicle Emission and Fuel Standards Program

Dear Administrator Perciasepe:

The American Academy of Pediatrics, the American Heart Association, the American Lung Association, the American Public Health Association, the American Thoracic Society, the Asthma and Allergy Foundation of America, Trust for America's Health, Healthcare Without Harm, and the National Association of City and County Health Officials submit these comments in support of the U.S. Environmental Protection Agency's proposed Tier 3 Motor Vehicle Emission and Fuel Standards Program. These standards are urgently needed and will help protect the health of millions of Americans who continue to breathe unsafe air.

Both the 10 parts per million low-sulfur gasoline standards and the tailpipe emissions standards are needed to achieve the greatest air quality benefits from existing and new vehicle technology.

Abundant scientific evidence exists on the health effects of ozone, particulate matter and other pollutants from tailpipe exhaust. Tier 3 standards will be effective tools to reduce such pollution and improve air quality. The comments below demonstrate the compelling case for EPA to adopt strong final Tier 3 Motor Vehicle Emission and Fuel Standards by December 31, 2013.

Tier 3 Motor Vehicle and Fuel Standards are urgently needed

Millions of people live in parts of the nation that EPA has recognized as having air quality that is unhealthy to breathe. As of December 2012, 159 million people lived in areas where the air quality failed to meet official national air quality standards. Of those, 123 million lived in areas where ozone too frequently reached unhealthy levels. Over 74.3 million lived where year-round $PM_{2.5}$ levels were too high.[1] We need all the available tools to reduce emissions and clean up the air in their communities.

Tailpipe pollution is a major source of emissions that contribute to the widespread burden of ozone and particulate matter pollution. While individual cars now have far lower emissions than in years past, the entire fleet of vehicles currently on the road emit large quantities of gaseous and

particulate matter pollution, including ozone precursors such as carbon monoxide, nitrogen oxides, and volatile organic compounds. Motor vehicles also emit other toxic air pollutants, including known carcinogens such as benzene, 1, 3-butadiene and formaldehyde.

Many groups face higher health risks from traffic-related air pollution

Near-roadway concentrations of vehicle emissions are higher than surrounding areas. About 17 percent of housing in America is located within 300 feet of a major roadway, railroad or airport where concentrations of harmful pollutants are likely higher than areas further away.[2] Over 18.2 million Americans meeting the federal poverty definition live in counties with high ozone pollution.[3] Evidence shows that people with low incomes may bear a greater burden from air pollution.[4]

Furthermore, individuals with pre-existing conditions such as asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease and diabetes face a greater burden from traffic related air pollution. There are 25.9 million Americans with asthma, including some 7.1 million children.[5] Ozone and particle pollution add to the burden they face every day. An estimated 83.6 million U.S. adults have some form of cardiovascular disease.[6] Short-term exposure to particulate matter or ozone pollution can trigger dangerous or fatal cardiac events in these populations, and longer-term exposure to particulate matter can decrease life expectancy by months or years.[7],[37] The 25.8 million Americans with diabetes may face an increased risk from particulate matter pollution due to its impact on their cardiovascular system. [8] African Americans, Mexican Americans and people living near a central city have higher rates of diabetes.[9]

Near-roadway exposures have emerged as a health threat affecting a large segment of the North American population, not just those that are economically disadvantaged. A 2010 review of existing research by the Health Effects Institute concluded that those living, working or going to school within 300-500 meters of a major roadway are exposed to higher concentrations of traffic related pollution. This includes 30-45 percent of the North American population living in urban areas. The report identifies a causal relationship between traffic pollution and asthma exacerbation in children, and suggestive evidence of a causal relationship with onset of childhood asthma, non-asthma respiratory symptoms, impaired lung function, total and cardiovascular mortality, and cardiovascular morbidity.[10]

Studies since 2010 have added to the evidence showing harm to health associated with traffic-related air pollution. Rosenbloom et al, (2012) examined data from patients from 64 medical centers across the U.S. and found increased risk of death for people with cardiovascular disease who live near major roadways.[11] Chen et al., (2013) found that, even in Canada where pollution levels are much lower than in the U.S., long-term exposure to traffic pollution was associated with higher risk of death from cardiovascular disease.[12] Andersen et al, (2011) found that years of exposure to pollution from traffic in Denmark may have increased the risk of developing COPD, a risk that may have even been enhanced in people who already had asthma or diabetes.[13]

The evidence of long-term harm to children from near-roadway exposures has also continued to expand. Newman et al, (2013) studied data from children in the Cincinnati area who spent the first year of their lives near a major highway. They found those children were more likely to have high hyperactivity scores when they reached school age, a risk factor for attention deficit/hyperactivity disorder (ADHD).[14] Grunzivea et al. (2013) found in a large study that Swedish children exposed to traffic in infancy were more likely to have asthma at age 12.[15]

Children face special risks from air pollution because their lungs continue to grow into adolescence and because they are more active outdoors than adults. According to the American Academy of Pediatrics in its policy statement recognizing the health hazards of outdoor air pollution, a child's developing lung is "highly susceptible to damage" from air pollution:[16]

> Children and infants are among the most susceptible to many of the air pollutants. In addition to associations between air pollution and respiratory symptoms, asthma exacerbations, and asthma hospitalizations, recent studies have found links between air pollution and preterm birth, infant mortality, deficits in lung growth, and possibly, development of asthma.[17]

Like children, older adults face a greater burden from air pollution. As the body ages it is less able to defend against the effects of air pollution. Adults age 65 and older are also more likely to have one or more of these diseases that are linked to higher risk.

In addition, healthy adults who work or exercise outdoors also may be at a greater risk of harm from air pollution. Studies such as those of lifeguards in Texas,[18] hikers in New Hampshire,[19] and farm workers in California[20] indicate that being outdoors longer, with often greater physical exertion increases the amount of pollution inhaled.

Cleaner gasoline and motor vehicles will save lives

In April, the American Lung Association released "*A Penny for Prevention: The Case for Cleaner Gasoline and Vehicles,"* a report that identified health benefits of cleaner gasoline and vehicles. The analysis used data drawn from a 2012 assessment of air quality in part of the Eastern United States[21] to estimate the benefits from having cleaner vehicles in 2030. The geographic scope of the 2012 study covered a large section of Eastern United States which included half the U.S. population and most major metropolitan areas currently suffering from air pollution. The American Lung Association report identified public health benefits that would be in place by 2030 if the majority of vehicles on the road were cleaner vehicles.

Lower ozone and particulate matter pollution that would result from cleaner gasoline and vehicles in place by 2030 would have important health benefits. This analysis estimated that the full implementation of cleaner gasoline and vehicles would prevent more than 2,500 premature deaths each year, avoid more than 15,000 asthma attacks each year, and avert more than 3.1 million missed work and school days each year. The monetized health and economic benefits would range between $8.5 billion and $22 billion annually. Health benefits of a nationwide Tier 3 program will likely be greater, since the above benefits are only estimated for half the population.

Motor vehicle pollution harms human health

Tailpipes emit many pollutants that EPA has long analyzed and found conclusive evidence of harm to human health. Three of them, carbon monoxide, nitrogen oxides and volatile organic compounds, have harmful human health impacts on their own but are also precursors to ozone and particulate matter. Tailpipes directly emit particulate matter as well as carcinogens and other air toxics. The adoption of cleaner gasoline and vehicle standards will reduce these tailpipe emissions significantly.

Ozone

In February, EPA completed the most recent review of the scientific evidence of the health effects from ozone pollution. EPA concluded that ozone pollution posed multiple, serious threats to health.[22]

This review confirmed that breathing ozone caused a "*broad range of respiratory effects, including altered development of the respiratory tract.*" (Italics in the original.) Ozone reduces lung function and increases wheezing and shortness of breath, triggers asthma attacks and increases the risk of hospital admissions and emergency department visits. This review also confirmed that ozone likely causes premature death.[23]

This latest review also identified several key new areas of concern. Breathing ozone likely causes cardiovascular harm, with evidence of systemic inflammation and oxidative stress and may cause harm to the central nervous system. Studies of long-term exposure to ozone suggest ozone may also cause reproductive or developmental harm, particularly low birth weight.[24]

Strong evidence exists of the deadly impact of ozone in large studies conducted in cities across the U.S., in Europe and in Asia. Researchers have repeatedly found that the risk of premature death increased with higher levels of ozone.[25,26,27] Moreover, the evidence shows that ozone causes premature death independently from effects of other pollutants.

Nitrogen oxides (NOx)

The EPA's most recent review found that oxides of nitrogen often concentrates along heavy-trafficked roadways; some studies have found that in heavy traffic, NO_x can be over twice the outdoor levels in nearby residential areas.[28] NO_x may be a hazard for drivers, including commuters, as it is commonly concentrated inside vehicles. The EPA has determined that short-term NO_x exposure is likely to cause respiratory harm, including airway inflammation in children, increased susceptibility to allergens, asthma attacks, chest tightness and difficulty breathing, resulting in missed school and work days, emergency room visits and hospitalizations.[29] Long-term NO_x exposure may stunt lung growth—which may be a risk factor for lung disease later in life. In adults there are respiratory effects but also evidence of cardiovascular effects from exposure to NO_x, with a robust association with cardiopulmonary mortality.[30]

Carbon monoxide (CO)

One of the long-recognized major pollutants in gasoline tailpipe emissions is carbon monoxide. Motor vehicles remain the dominant source of carbon monoxide in the air.[31] Carbon monoxide causes a range of harmful effects, particularly to the cardiovascular system. The growing evidence of harm to cardiovascular disease has shown an increase in hospital admissions and emergency department visits for ischemic heart disease, heart attacks, and congestive heart failure.[32] In addition, carbon monoxide combines in the air with nitrogen oxides and volatile organic compounds to form ozone.[33]

Particulate matter

Tailpipes both directly emit particles and gases that form particles in the atmosphere: nitrogen oxides, sulfur dioxide and volatile organic compounds (VOCs). Because of their small size, particles can stay suspended in the atmosphere for days or weeks and be transported into nearby neighborhoods or over hundreds of miles, affecting people in neighboring cities and states. Once inhaled, fine and ultrafine particulate matter bypasses the body's clearance mechanisms and

penetrates deep into the lung and into the cardiovascular system carrying with it other toxic substances.[34]

First and foremost, exposure to particle pollution can kill. Breathing high levels of particulate matter pollution day in and day out can be deadly, as landmark studies in the 1990s conclusively showed.[35] Chronic exposure to particulate matter can shorten life by one to three years.[36]

Strong evidence warns that particulate matter exposure, especially coarse particulate matter (PM_{10}), increases the risk of death in infants. Glinianaia et al. (2004) in their review of research into infant deaths from particulate matter, found the strongest associations for post-neonatal mortality from respiratory causes and sudden infant death syndrome.[37] In a review of research on pregnancy outcomes, Šrám et al (2005) concluded that the evidence was "sufficient to infer a causal relationship between particulate air pollution and respiratory deaths in the post-neonatal period."[38]

The American Heart Association Scientific Statement reflects the growing evidence that fine particulate matter ($PM_{2.5}$) causes cardiovascular harm:

> Exposure to PM <2.5 μm in diameter ($PM_{2.5}$) over a few hours to weeks can trigger cardiovascular disease–related mortality and nonfatal events; longer-term exposure (e.g., a few years) increases the risk for cardiovascular mortality to an even greater extent than exposures over a few days and reduces life expectancy within more highly exposed segments of the population by several months to a few years; reductions in PM levels are associated with decreases in cardiovascular mortality within a time frame as short as a few years; and many credible pathological mechanisms have been elucidated that lend biological plausibility to these findings. It is the opinion of the writing group that the overall evidence is consistent with a causal relationship between $PM_{2.5}$ exposure and cardiovascular morbidity and mortality.[39]

In the 2009 review of the science, EPA concluded that particulate matter caused early death (via both short-term and long-term exposure); cardiovascular harm (e.g. heart attacks, strokes, heart disease, congestive heart failure), was likely to cause respiratory harm (e.g. worsened asthma, worsened COPD, inflammation) and may cause cancer and reproductive and developmental harm.[40]

Air toxics

Air toxics include both PM and VOCs that come from both tailpipes and evaporative emissions of gasoline from vehicles in hot weather and while fueling. Some are gases; some are particles and some adhere to particles. Benzene, a known carcinogen and a major component of the evaporative emissions from gasoline, is perhaps the most studied air toxic, but it is not the only carcinogen from gasoline emissions. Some traffic-generated carcinogens or probable carcinogens include 1, 3-butadiene, acetaldehyde and formaldehyde. Other air toxics include VOCs, such as toluene, xylenes, naphthalene, and acrolein; polycyclic aromatic hydrocarbons (PAHs); and some metals (chromium, nickel). However, other toxics in gasoline are also harmful to breathe.[41,42]

Conclusion: EPA should adopt strong standards in 2013

The motor vehicle emissions and fuel standards EPA has proposed will reduce dangerous pollution spewing out of tailpipes all across the nation. These standards will save lives and will help protect the health of millions of Americans who continue to breathe unsafe air. Our organizations urge EPA to adopt these standards as soon as possible and, certainly, before the end of this year.

Sincerely,

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