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**Comments from the American Thoracic Society
Presented by Mary B. Rice MD
Before the House Committee on Science, Space and Technology on
EPA's Proposed Ozone National Ambient Air Quality Standard
March 17, 2015**

Mr. Chairman, Ms. Ranking member, my name is Dr. Mary Rice. I am an adult pulmonologist and critical care physician at Beth Israel Deaconess Medical Center and Harvard Medical School in Boston, and also a member of the Health Policy Committee of the American Thoracic Society. When I am not caring for patients, I am engaged in research on the respiratory health effects of ambient pollution exposure in children and adults. On behalf of the American Thoracic Society I want to thank the Committee for the opportunity to testify regarding the Ozone National Ambient Air Quality Standard proposed by the Environmental Protection Agency (EPA). The American Thoracic Society is a medical professional organization with over 15,000 professionals and patients who are dedicated to the prevention, detection, treatment and cure of respiratory disease, critical care illnesses and sleep-disordered breathing. We pursue our mission through research, clinical care, education and advocacy.

It has been known for a long time that ozone (O₃) is a potent oxidant that irritates and damages the airways and lungs. The American Thoracic Society strongly supports EPA's proposal to strengthen the National Ambient Air Quality Standard for ozone. If anything, we are disappointed EPA did not go further is recommending a stronger standard of 60 ppb.

For several years, the ATS has encouraged the EPA to issue a more protective ozone standard. When the standard was reviewed in 2007 under the Bush Administration, we recommended a health-based, 8-hour standard of 60 ppb based on the available evidence at that time¹. When the Obama Administration first reconsidered this standard in 2010, we again urged 60 ppb². While the recommended standard endorsed by the physician community has not changed during this time, the scientific evidence supporting this recommendation has significantly strengthened. The evidence available seven years ago justifying this recommendation has been supplemented by an even greater understanding of the health effects of ozone exposure, including greater exacerbation of respiratory disease in infants and children, worse lung function in healthy adults and those with lung disease, hospitalization for asthma and chronic obstructive lung disease, and increased mortality in adults. There is clear, consistent, and conclusive evidence that we believe should compel EPA to establish an ozone standard no higher than 60 ppb³.

Ozone exposures in the range of 60 ppb to 70 ppb have adverse physiologic effects across the entire age spectrum—from newborn infants to the elderly. While there is also some evidence of health effects of ozone exposure below 60 ppb, the strongest evidence supports the conclusion that serious adverse health effects occur across all ages at levels above 60 ppb.

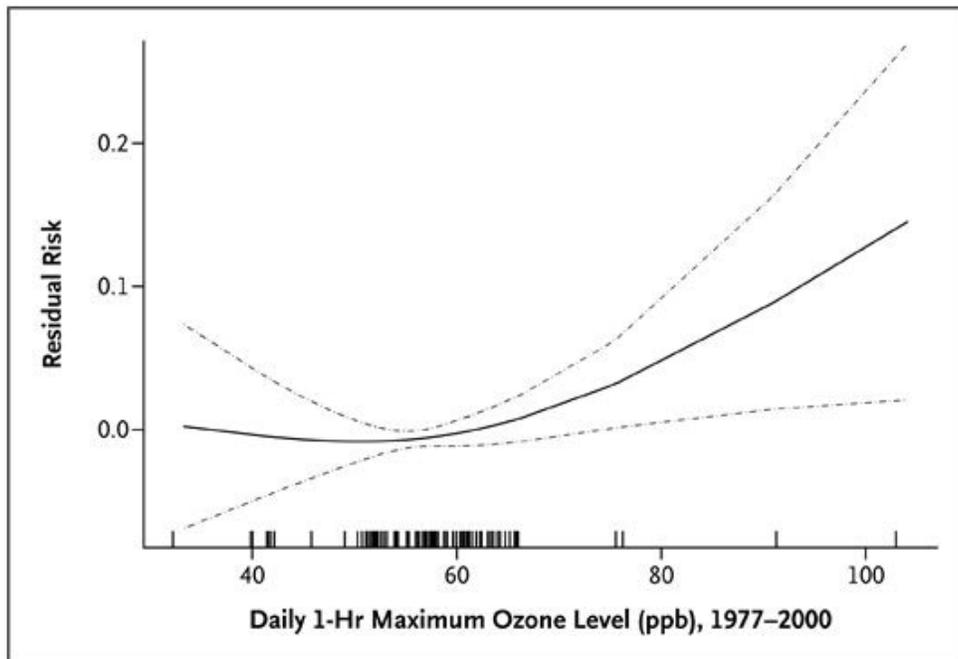
Highlights of this new body of evidence include several lines of evidence demonstrating dose-response relationships between ozone exposure above 60 ppb and childhood asthma hospital admissions and emergency room visits⁴⁻⁷ and a new study of emergency department visits by preschool children in Atlanta, which found that each 30 ppb increase in the three-day average of ozone was associated with an 8% higher risk of pneumonia⁸.

Today, ozone pollution – at levels permissible under the current standard – makes children sick. EPA has the authority and obligation to set a standard that protects children from the adverse health effects of ozone exposure.

But it's not just children -- adults are also harmed by ozone exposure. Research has shown that for each incremental rise in ozone exposure, severe asthma exacerbations, emergency room visits, and hospitalizations for asthma increase for adults^{7,9,10}. Similar associations have been found for adult admissions for chronic obstructive pulmonary disease^{11,12} and pneumonia¹². In my own work with colleagues at the Harvard School of Public Health and the Framingham Heart Study, we examined lung function in more than 3,000 healthy adults and found that lung function was substantially lower (by 55 mL) when ambient ozone ranged from 60 to 75 ppb compared to days with levels under 60 ppb¹³. This analysis did not even include any days with levels above our current standard of 75 ppb. Six epidemiological studies in the U.S. and Canada provide further real-world evidence that a standard of either 70 ppb or 65 ppb fails to provide adequate protection. These studies (Bell et al., 2006; Cakmak et al., 2006; Dales et al., 2006; Katsouyanni et al., 2009, Mar and Koenig, 2009; Stieb et al, 2009)¹⁴⁻¹⁹ identified positive associations between ozone exposure and premature death, increased hospital admissions and emergency department visits primarily for respiratory condition as well as cardiac conditions. Controlled human exposure studies have re-affirmed lung function decrements in healthy adults after exposure to 60 ppb to 70 ppb of ozone^{20,21}. Numerous animal toxicology studies have demonstrated damage to the lung tissue after ozone exposure, including evidence of lung damage at levels in the 60 to 70 ppb range^{22,23}.

Perhaps of greatest concern, there is now stronger evidence of increased mortality in association with higher ozone levels²⁴⁻²⁶, particularly among the elderly and those with chronic disease^{27,28}. These large, multi-city studies found strong and consistent associations with increased risk of premature death, particularly in the warmer months when ozone levels are higher. The figure below, published in a paper in the *New England Journal of Medicine* in 2009, demonstrates the dose-response relationship between ozone levels and death from respiratory causes²⁹. There is a linear relationship between ozone concentration and risk of respiratory death above levels of 60 ppb:

Exposure–Response Curve for the Relation between Exposure to Ozone and the Risk of Death from Respiratory Causes



A study published by investigators at the Johns Hopkins School of Public Health estimated the annual numbers of ozone-related premature deaths that could be avoided with full attainment of an ozone standard of 75 ppb, 70 ppb and 60 ppb³⁰. If all non-attainment areas in 2005 to 2007 were instead in full compliance with the current 75 ppb standard, an estimated 1500 to 2500 premature deaths would be avoided each year. This increases to 2500 to 4100 premature deaths at 70 ppb, and 5200 to 8000 premature deaths at an attained ozone standard of 60 ppb. This study also estimated that 10 million cases of acute respiratory symptoms and 3.5 million lost school days would be avoided nationally if we attained a standard of 60 ppb of ozone.

In sum, there is abundant and consistent scientific evidence demonstrating that ozone pollution – at levels permitted by the current standard – is damaging to the human lungs and contributes to illness and death. Ozone is particularly harmful to certain people, including babies, children and adults with asthma, people with chronic obstructive pulmonary disease, and the elderly. The EPA and the Administration both have the authority and the obligation to establish a more protective ozone standard. The American Thoracic Society strongly urges EPA and the Administration to finalize a more protective ozone standard of 60 ppb.

I would be happy to answer any questions.

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