

Children's Environmental Health Center of the Hudson Valley

New York Medical College, Valhalla, New York 10595

P: 914-493-7585 F: 914-594-2350

CHILDREN'S ENVIRONMENTAL HEALTH CENTER OF THE HUDSON VALLEY

PROTECTING CHILDREN AGAINST ENVIRONMENTAL THREATS

www.ChildrensEnvironment.org

November 1, 2015– CHILDREN'S HEALTH ADVISORY

Ozone and Children's Health: What is the latest news?

November 1, 2015: Ozone can have both protective and harmful effects on health and the environment, depending on its location in the atmosphere. In the troposphere, the air closest to the Earth's surface, ground-level or "**bad**" ozone is a pollutant that is a significant health risk, especially for children with asthma. The stratosphere, or "**good**" ozone layer, extends upward from about 6 to 30 miles and protects life on Earth from the sun's harmful ultraviolet rays. This natural shield has been gradually depleted by man-made chemicals. Scientific evidence shows that ozone in the troposphere can cause a number of harmful effects on the respiratory system, including difficulty breathing, decline in pulmonary function testing, and inflammation of the airways. For people with pulmonary diseases such as asthma and COPD (chronic obstructive pulmonary disease), these effects can aggravate their diseases, leading to increased medication use, poor quality of life, and frequent emergency room visits and hospital admissions. Evidence also indicates that long-term exposure to ozone is likely to be one of many causes of asthma development.

About 23 million people or more have asthma in the U.S., including an estimated 6.1 million children. Children, including teenagers, are among those most at risk from ozone exposure for several reasons. First, their lungs are still developing and continue to develop until adulthood. Children breathe more air per pound of body weight than adults. This means if the air contains ozone, children get a higher "dose" of ozone for their weight than adults. Children are active outside more than adults, making them more susceptible to the effects of ozone. Lastly, they are more likely to have asthma.

The Clean Air Act, which originally passed in 1973, is a United States federal law designed to control air pollution on a national level. The law requires the EPA to set national ambient air

quality standards (NAAQS) for ozone and five other pollutants considered harmful to public health and the environment (the other pollutants are particulate matter, nitrogen oxides, carbon monoxide, sulfur dioxide and lead). The EPA is also required to periodically review these standards to ensure that they provide adequate health and environmental protection, and to make updates as necessary.

On October 1, 2015, the EPA strengthened the NAAQS for ground-level ozone to 70 parts per billion (ppb), based on extensive scientific evidence about the harmful effects of ozone on public health and welfare. The updated standards were developed to improve public health protection, particularly for at-risk groups including children, older adults, people of all ages who have lung diseases such as asthma, and people who are active outdoors. The intent is also to improve the health of the environment including trees, plants and ecosystems. Based on an expanded body of scientific evidence that includes thousands of studies on the effects of ozone on health, the EPA Administrator has concluded that the 2008 standard of 75 ppb is not requisite to protect public health with an adequate margin of safety, as required by law. New clinical studies provide information clearly showing that ozone at 72 ppb can be harmful to healthy exercising adults. The effects of ozone on children were especially important in determining these standards due to repeated exposures. The more times children are exposed to ozone, the more likely they will be to experience serious health effects due to the cumulative nature of exposure.

The results of the clinical studies and risk and exposure analyses indicate that a standard of 70 ppb will protect public health by being below the level shown to cause adverse health effects. The EPA estimates that meeting the 70 ppb standards will yield health benefits valued at \$2.9 to \$5.9 billion annually in 2025 nationwide outside of California (analyzed separately). These annual benefits include the value of avoiding a range of harmful health effects, including: 320 to 660 premature deaths, 230,000 asthma attacks in children, 160,000 missed school days, 28,000 missed work days, 630 asthma-related emergency room visits, 340 cases of acute bronchitis in children. The EPA will be working closely with states as they develop State Implementation Plans (SIPs) to reduce emissions of ozone precursors within individual jurisdictions. The agency will continue these collaborative efforts for the updated ozone standards, including reviewing air quality during the designations process, which is the first step in implementing the updated standards.

Sources:

- United States Environmental Protection Agency Website: <http://www3.epa.gov>.
- Dick S, et al Associations between environmental exposures and asthma control and exacerbations in young children: a systematic review. *BMJ Open* 2014;4.
- Moore K, et al Ambient Ozone Concentrations Cause Increased Hospitalizations for Asthma in Children: An 18-Year Study in Southern California. *Environ Health Perspect*; 2008; 10.

