

EPA predicts that lowering ozone levels in Houston will result in increased premature deaths

WILL EPA'S PROPOSED NEW OZONE STANDARDS PROVIDE MEASURABLE HEALTH BENEFITS?

By Dr. Michael Honeycutt
Director, TCEQ Toxicology Division

Note: article updated 10/9/2014.

The EPA is considering lowering the existing national eight-hour ozone standard from its current level of 75 parts per billion (ppb) to a much lower range, between 70 and 60 ppb. However, after an in-depth review of the EPA's analysis, as well as a thorough study of the relevant scientific literature, the TCEQ has concluded that there will be little to no public health benefit from lowering the current standard.

Surprisingly, the EPA's own modeling in 12 cities across the country indicates the net result will be *increased* mortality in some areas, including Houston and Los Angeles. The EPA did not perform the analysis for other cities in Texas.

There is no doubt that, at some higher level, ground-level ozone is harmful to human health. The question is, has the EPA adequately demonstrated that lowering the ozone standard to 70–60 ppb would actually have health benefits? We think that the EPA's process of setting ozone standards has not scientifically proven this, and that further lowering of the ozone standard will fail to provide any measurable increase in human health protection.

The EPA's own modeling in its Health Risk and Exposure Assessment ([HREA](#))

Getting to Know Dr. Michael Honeycutt, Director, Toxicology Division



Dr. Michael E. Honeycutt is a dedicated, distinguished scientist who has served the people of Texas through his work for the Toxicology Division of the TCEQ since 1996. He has served as director of the division since 2009.

He is a dedicated family man. He and wife Lucinda have been married for 27 years and have two sons: Ethan, a sophomore at UT Dallas, and Adam, a senior at Pflugerville High School. They have lived in Pflugerville for 18 years, where he is active in his church and in the Boy Scouts. His hobby is woodworking, although he admits it's hard to find time to pursue it as much as he would like.

Dr. Honeycutt joined the TCEQ after working for the U.S. Army Corps of Engineers in Mississippi. He has a bachelor's degree and Ph.D. in toxicology from the University of Louisiana at Monroe.

Dr. Honeycutt is a full member of the Society of Toxicology, a worldwide professional and scholarly organization of scientists from academic institutions, government, and industry representing the great variety of scientists who practice toxicology in the U.S. and abroad.

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Number of Premature Deaths in Houston Predicted by EPA

	Net Impact on Mortality
Meeting current standard (75 ppb) from present day ozone levels	47 more deaths
Going from present levels to 70 ppb	48 more deaths
Going from present levels to 65 ppb	44 more deaths
Going from present levels to 60 ppb	35 more deaths

This table, which was made using EPA's own modeling, indicates that reducing ozone in the Houston area will actually result in *increased* premature deaths. Whether this predicted result is factual, or if it just highlights flaws in the EPA's interpretation of the data, it casts doubt on the science being used to justify EPA's proposed lower ozone standards.

Based on 2009 data—EPA, *Final Health Risk and Exposure Assessment*, Appendix 7, p. 7B-2

indicates that lowering ozone concentrations would actually result in more deaths in some cities (Appendix 7, page 7B-2 of the HREA). Either this indicates that lowering the ozone standard defeats its stated purpose of protecting human health, or it indicates that something is wrong with the EPA's interpretation of the data. Either way, it's not a good argument for lowering the ozone standard.

Further, the EPA is not very forthcoming about the increased deaths. It's not mentioned in the executive summary of their policy analysis, but it's found on page 115 of Chapter 3, more than one third of the way through the 597-page document.

The EPA's proposed lower ozone standard derives much of its claimed benefits from associating ozone with worsening asthma. The problem with this association

is that asthma diagnoses are increasing in the U.S., yet nationwide, air quality is improving. If asthma were actually tied to ozone, you would expect to see the instances of asthma decreasing, not increasing. In fact, data from Texas hospitals show that asthma admissions are actually highest in the winter, when ozone levels are the lowest.

The evaluation of the proposed ozone standard was performed by the TCEQ

Getting to Know Dr. Michael Honeycutt, Director, Toxicology Division (continued)

He has co-authored scientific articles on a wide variety of toxicological subjects in a number of scientific journals, and is cited three times in the Encyclopedia of Toxicology. Dr. Honeycutt has given invited testimony before the U.S. House of Representatives four times, and has appeared before the Texas Legislature numerous times.

He frequently participates on committees, boards, workshops and panels, and has presented at dozens of symposia and conferences across the United States.

"I consider myself extremely lucky to be leading our team of 15 toxicologists," he said. "No state has a more dedicated, distinguished team of scientists committed to serving its citizens. The excellence of their work in setting safe exposure levels for a wide variety of chemicals and compounds is recognized when these levels are adopted by many other states and countries."

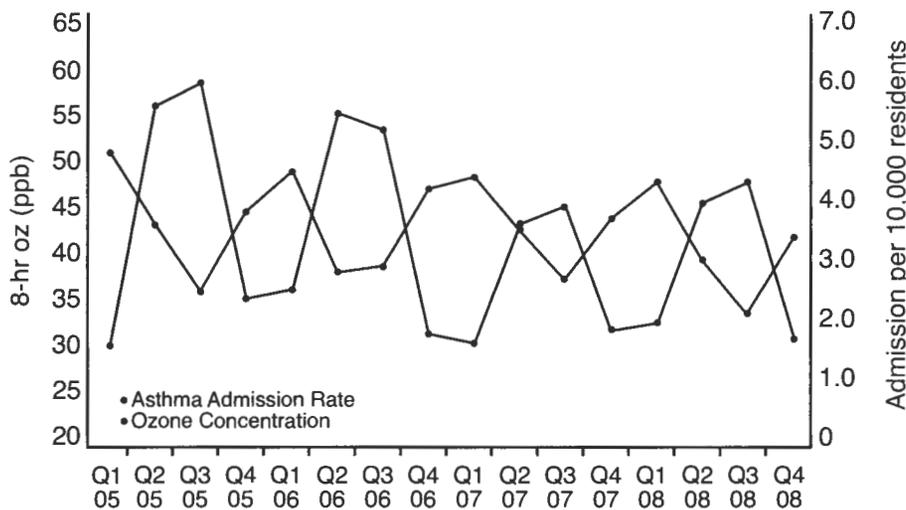
"I love my job," he said. "As a scientist, I love following the facts to a conclusion, even if it is contrary to accepted wisdom."

Dr. Honeycutt says his data aren't always welcome. "I was cussed out by the mayor of a West Texas town when I told him to shut down the town's water supply because of contamination. And I pushed the agency to do a large-scale monitoring survey in the Barnett Shale when I saw a couple of benzene readings that were concerning to me."

"I always tell people, 'Show me where I'm wrong,' and I'm willing to accept it if they do. That's the definition of science. I also love the fact that I'm expected to interpret data objectively. I don't have to hype data in hopes of getting a grant or donations to fund my position," said Dr. Honeycutt.

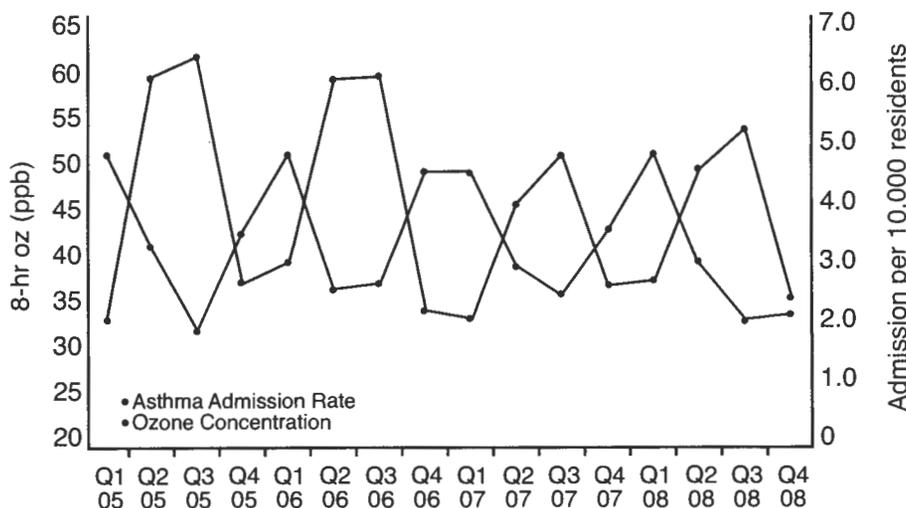
Dallas County

Quarterly Average Peak 8-hr Ozone vs Quarterly Hospital Age-Adjusted Admission Rate, Dallas County



Denton County

Quarterly Average Peak 8-hr Ozone vs Quarterly Hospital Age-Adjusted Admission Rate, Denton County



Data collected from Texas hospitals indicates that admissions for asthma are actually highest in the winter, when ozone concentrations are normally lowest. This casts further doubt on the EPA's assertion that ozone is an important driver of asthma symptoms.

Toxicology Division, which consists of 10 Ph.D. and five master's level scientists. Our scientists specialize in toxicology and risk assessment related to air contaminants, and set guidelines and toxicity factors that are adopted by many different states and countries.

The sciences (toxicology, molecular biology, biochemistry, cell biology, chemistry, just to name a few) used to set the EPA's standards are complex and technical. Toxicology Division members Stephanie Shirley (Ph.D., UT MD Anderson Cancer Center, molecular carcinogenesis), Sabine Lange (Ph.D. UT MD Anderson Cancer Center, biochemistry and molecular carcinogenesis), Neeraja Erraguntla (Ph.D., LSU, physiology, pharmacology and toxicology), and I immersed ourselves in ozone toxicology and epidemiology. We presented a paper titled "[A Toxicological Review of the Ozone NAAQS](#)" at various professional meetings, and are helping prepare ground-breaking analyses of the ozone data for publication in peer-reviewed journals.

Below are a few facts and simplified explanations of the TCEQ's conclusion that a lower ozone standard is not justified.

You can find links to other references and ozone information at www.tceq.texas.gov/goto/ozone-science.

Sensitivity of Asthmatics to Ozone:

- Exposure of human volunteers to ozone showed similar lung effects in asthmatics and in non-asthmatic subjects. Additionally, children are no more sensitive to ozone than are young adults.

Mortality Caused by Long-term Exposure to Ozone:

- Only 1 out of 12 studies considered by the EPA showed an association between long-term exposure to ozone and early death (after considering other pollutants). This single study is used by the EPA as evidence that long-term exposure to ozone causes mortality. Interestingly, this study did not show higher mortality in Southern California, where some of the highest ozone levels in the country are measured.

Ambient Ozone Concentrations Don't Represent Real-world Exposure:

- Ozone is an outdoor air pollutant, because systems such as air conditioning remove it from indoor air. Since most people spend more than 90 percent of their time indoors, we (and the people in the epidemiology studies used to

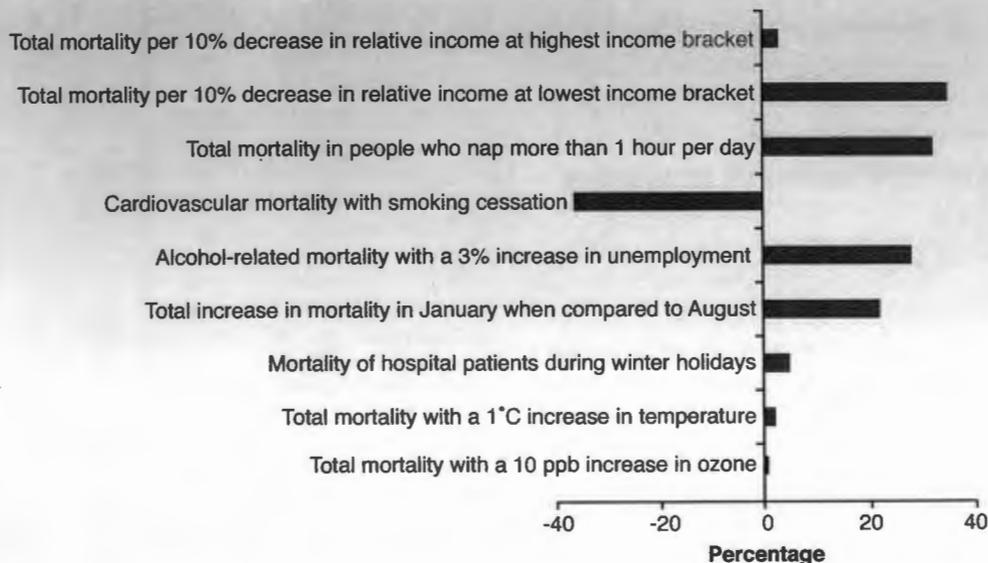
justify lowering the standard) are rarely exposed to significant levels of ozone.

- Even people who work outdoors are exposed to, at most, 60 percent of the ozone concentration that is measured at an ambient monitor. Additionally, there are ozone standards particularly for workers to ensure that they are protected.
- For ozone to cause a slight change in lung function in clinical studies, people need to be exposed to outdoor levels of ozone for hours while vigorously exercising (example: 6 hours of bicycling). These changes in lung function are often so small that they are within a person's *normal* daily variation.
- Epidemiology studies show an association between a person's likelihood of dying, and the outdoor concentrations of ozone in the days before (or the day of) a person's death. However, we spend most of our time indoors (particularly people who are near death), so the people in the studies were exposed to levels of ozone that are far below those that cause any clinical effect.

Problems with Implementing a New Ozone Standard:

- Some places in the U.S. have background levels of ozone that account for up to 80 percent of total ozone. Background ozone occurs naturally, or is transported from other countries. The EPA does not take this into account when making the rule.
- Ozone is not produced directly, but instead forms when other chemicals (particularly nitrogen oxides) react with sunlight. However, ozone chemistry is complicated, and the same nitrogen oxides that produce ozone can also react with existing ozone to remove it from the air. So places that have high nitrogen oxide production (such as areas

MORTALITY COMPARISON



Many factors influence mortality, and the effect of an increase in ozone by 10 ppb is tiny in comparison to these other influences.

near roads), often have lower ozone levels.

- Because ozone chemistry is complex, lowering ozone-producing chemicals in the cities would decrease ozone in the suburbs, but could increase ozone in the inner-cities (because there will be a decrease in the nitrogen oxides that can remove ozone). This means that, according to EPA predictions, those living in the inner cities could bear more health burdens, while people on the outskirts enjoy the predicted benefits.

Proponents of lower ozone standards sometimes advance the argument that even if the lower standards are not scientifically justified, what is it going to hurt to have cleaner air? The answer is, why regulate something that is not really going to have a benefit? That effort should be put into regulating something that will have a benefit—perhaps air toxics—perhaps figuring out what is causing increased reported rates of asthma—perhaps looking at indoor air quality, which probably has a bigger impact on health than outdoor air quality, because data shows Americans likely spend at least 90 percent of their time indoors.

There are costs to regulation. Increased regulatory costs make nearly all goods and services more expensive, particularly energy. There is a real, human cost resulting from higher energy bills, especially in Texas. For poor Texans (and many poor Texans are elderly Texans), being able to keep their home cool on hot and humid summer days has a real health benefit.

If an area violates an ozone standard, it is in nonattainment, and new regulations are imposed, with the goal of bringing those areas into attainment. Those regulations and the expenses they impose make it more difficult and more expensive for many existing businesses and industries to operate, and those costs are eventually passed on to the consumer.

Being in nonattainment also means that new businesses that produce qualifying emissions may have to purchase emissions offsets to open their doors, or consider opening their business in another area that is in attainment.

If the EPA decides the new ozone standards should be at the lower end of the range, close to 60 ppb, it is likely that areas like El Paso; San Antonio; Victoria; the Tyler region in East Texas; the I-H 35 corridor between San Antonio and Dallas-Fort Worth, including Austin and Waco; Beaumont and Port Arthur; parts of the Panhandle and Rio Grande Valley; and Big Bend National Park would be in nonattainment.

For the DFW and Houston-Galveston-Brazoria areas, which are already in nonattainment, and already heavily regulated, reaching attainment would become even more difficult and further impact economic growth. All residents of these areas would be affected.

A study commissioned by the National Association of Manufacturers found that, in a scenario where new ozone standards constrained natural gas production, electricity prices could increase by 15 percent for residential customers and 23 percent for industrial customers. The study found that the new ozone standards could reduce U.S. GDP by \$270 billion per year and result in 2.9 million fewer job equivalents per year on average through 2040.

The Clean Air Act, which sets air quality standards for six pollutants including ozone, is the only federal environmental law that expressly forbids the EPA from considering the feasibility and costs of attaining a standard. In my mind, that should set the bar higher for the science. This is particularly the case with ozone, because the economic costs would be enormous, and the standard will be almost unachievable even if the public is able to bear those costs. There should be no doubt that lowering the standard will result in

health benefits, but that is not the case for this consideration of the ozone standard. How can the EPA in good conscience make a policy decision this expensive when the data are so contradictory that their own modeling predicts more deaths in some areas from lowering the standard?

I'm often asked, wouldn't it be easier to just accept what the EPA does? Isn't it a lot of trouble to try to affect the direction of the EPA's 16,000 employees and \$8 billion budget? Yes, of course that would be easier, but it wouldn't be the right thing to do.

Environmental regulations should be based on sound science. If they are not, then it opens the door for regulations that are based on politics, or on other reasons that do not benefit the public. The TCEQ has been provided with the expertise and funding to do research and science to assure that regulations are effective and beneficial to the environment and to public health. That is what the legislature and the people of Texas task us to do, and we take that task very seriously. ♻️

Information Online

EPA's Health Risk and Exposure Assessment
www.epa.gov/ttn/naaqs/standards/ozone/s_o3_2008_rea.html

EPA's Policy Assessment
www.epa.gov/ttn/naaqs/standards/ozone/s_o3_2008_pa.html

Asthma Information
www.cdc.gov/asthma/pdfs/asthma_facts_program_grantees.pdf

Ozone Levels/Trends
www.epa.gov/airtrends/ozone.html

A Toxicological Review of the Ozone NAAQS
www.tceq.com/assets/public/implementation/tox/ozone/superconference.pdf

Links to Additional Ozone Information
www.tceq.texas.gov/assets/public/implementation/tox/ozone/ozone_science.pdf

NAM Economic Report
www.nam.org/Special/Media-Campaign/EPA-Overregulation/Ozone-Regulations.aspx



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