



Daniel W Nebert, MD, Professor
Department of Environmental Health
College of Medicine
University of Cincinnati Medical Center
P.O. Box 670056
Cincinnati, OH 45267-0056

Phone 503-694-8482
503-815-1977
Fax 513-558-4397

dan.nebert@uc.edu

13 August 2016

Anthony Oliver, PhD aoliver@aqmd.gov
SCAQMD Air Quality Specialist

Dear Dr. Oliver and All Others Concerned:

I have been asked by Professor James E. Enstrom (UCLA) to express my opinion to you-all concerning “particulate matter of the size 2.5 micrometers in diameter (**PM2.5**) as being “*unequivocally the direct cause* of at least 2,100 deaths per year in Southern California”.

By way of introduction, I am author/coauthor of more than 650 peer-reviewed scientific publications and among the “640 most-cited authors of all time” by my peers—as determined by **Google Scholar** parameters. My fields of research interest as a physician-scientist include genetics, comparative and evolutionary genomics, gene nomenclature, drug metabolism, pharmacogenetics, adverse drug reactions, personalized medicine, environmental contaminants and disease, pediatrics, developmental biology, teratogenesis, neurobiology, endocrinology and cancer. I am board-qualified in both California and Ohio in the practice of medicine and have been Principal Investigator (PI) on numerous basic science and clinical research projects, some of which are still in preparation for publication. At the University of Cincinnati, I was Founder of the **Center for Environmental Genetics** (1992-98), which is still going strong today in its 25th year (current PI is Professor Shuk-mei Ho); I continue to participate in CEG’s Community Outreach and Education Program (COEP) directed by Dr. Erin Haynes. I also have spearheaded the worldwide standardized nomenclature system (based in London) for all genes and gene families in all living organisms.

Particulate matter has been studied extensively—by many scientists, including by one of the leaders in this field, **Joel Schwartz**, who applied longitudinal data analysis to environmental health. There was a controversy about his work on PM10 and mortality; these findings were therefore re-analyzed twice by the Health Effects Institute (funded 50% from the US EPA and 50% from automotive manufacturers). Whereas the magnitude of the effect was somewhat diminished on this re-analysis, “a small effect” was still seen, although statistically not significant [<http://pubs.healtheffects.org/getfile.php?u=21>]. Most disturbingly, the variability among and between studies was very substantial. Explanations for this variability were suggested to include “the degree of temporal smoothing used in the original analyses, number of smoothed terms in the models, and degree of nonlinear collinearity (concurvity) among the smoothed terms.” The relative importance of these and other explanations remains highly equivocal.

Joel Schwartz also used these methods to examine the relationship of PM2.5 with mortality. He and others have estimated an association to be “a ~10% increase in mortality for every 10 $\mu\text{g}/\text{meter}^3$ —**above** (but not below) 10 $\mu\text{g}/\text{meter}^3$. At 20 $\mu\text{g}/\text{meter}^3$, it was possible to measure a slight increase in mortality in a study of 10,000 deaths. However, at levels in the range of 10–15 $\mu\text{g}/\text{meter}^3$, the study would require a very large cohort in order to gain sufficient statistical power to detect “an unequivocal effect”.

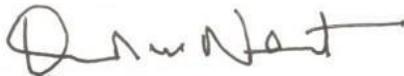


The PM2.5 relationship was assessed considerably before the 21st century, when several cities (e.g. Allegheny County, Pittsburgh) suffered from levels above 20 µg/meter³. **However, these levels of air pollution no longer exist, anywhere in the United States today.** This is mainly because many of the antiquated power plants have been converted to natural gas or have shut down. Thus, I do not believe that particulate matter air pollution is a major problem any longer in this country—although it remains a challenge in certain cities of China and India.

In conclusion, existing evidence on “the relationship between PM2.5 and total mortality in California” (and indeed, nationally) is **absolutely underwhelming** for SCAQMD to claim that “PM2.5 **causes** 2,100+ deaths per year in the South Coast Air Basin”. It is categorically unethical to use that claim as the primary public health justification for a 2016 Air Quality Management Plan that **imposes a burden of \$38.2 billion in additional compliance costs** on the Southern California taxpayers and their economy.

This is yet-another glaring example of “public policy being pushed forward—despite any solid scientific evidence supporting the proposed policy.” As a physician-scientist who is proud of scientific integrity in all his published research for more than five decades, I find this behavior despicable and I denounce it. I urge you to take these comments seriously.

Sincerely,



Daniel W Nebert, BA [biochem], MS [biophys], MD [pediatrics], Professor Emeritus
Department of Environmental Medicine and Center for Environmental Genetics
University of Cincinnati College of Medicine, Cincinnati, OH 45267
Department of Pediatrics & Molecular Developmental Biology, Division of Human Genetics
Cincinnati Children's Hospital, Cincinnati, OH 45229
Affiliate Faculty, Department of Environmental & Molecular Toxicology, Oregon State University,
Corvallis, OR 97331
Consultant, Department of Environmental Health Sciences, Yale University School of Public Health,
New Haven, CT 06520

cc:

Jo Kay Chan Ghosh jghosh@aqmd.gov
Henry A. Roman har@indecon.com
George D. Thurston george.thurston@nyumc.org
Elaine Shen eshen@aqmd.gov
Philip M. Fine pfine@aqmd.gov
Wayne Nastri wnastri@aqmd.gov
Eula Bingham, Professor Emeritus, Undersecretary-of-Labor, 1977-81 eula.bingham@uc.edu

