UTAH PHYSICIANS
for a HEALTHY ENVIRONMENT

September 19, 2017

Dear Clean Air Caucus Members:

Utah Physicians for a Healthy Environment (UPHE) have learned that you have scheduled a presentation by James Enstrom on air pollution and mortality. We are aware of e-mails from groups and individuals that have discouraged you from considering his point of view. As you are likely proceeding with this, you need to know the entire story behind James Enstrom and his claims.

Mr. Enstrom has a PhD in physics, a master's degree in epidemiology, and taught for many years at UCLA. Beyond his epidemiology background he has no legitimate claim to expertise in medicine, health and disease. He is part of a small network of professional contrarians who advocate for extreme, controversial, and largely untenable positions on several issues. Mr. Enstrom claims research and expertise in a wide variety of topics— the health consequences of first and second hand cigarette smoke, PM 2.5 air pollution, diesel exhaust, the health benefits of Vitamin C, and the widely discredited theory of hormesis, which contends that low doses of toxins like air pollution and radiation are actually beneficial. Hormesis has been rejected by the National Academy of Sciences.

The issue of how funding affects the ultimate results and conclusions of research has been well documented. Enstrom is perhaps best known for publishing research claiming to show that there is little to no connection between first hand smoking and lung cancer, and little to no health consequences from second hand tobacco smoke. Enstrom received close to a million dollars to conduct his research for the Center for Indoor Air Research and the Council for Tobacco Research, both tobacco industry front groups. Enstrom's research was singled out by a federal judge as a significant part of the tobacco's industry conspiracy to endanger and defraud the public. Specifically, the judge cited communication between Enstrom and Phillip Morris to produce the desired research results, which was pivotal in ruling the tobacco industry was guilty of racketeering. In the Dept. of Justice's extensive case against the tobacco industry, they devoted an entire chapter to Enstrom. He used a small subset of data provided by the American Cancer Society (ACS) in a manipulative way to produce a result most favorable to the tobacco industry, a specific charge made by the judge, despite being warning by the ACS against it.

Ultimately Enstrom was fired by UCLA for a long list of reasons. He claims he was vindicated and reinstated after a law suit. That claim stretches the truth. The lawsuit was settled, and a monetary award granted, but he no longer is allowed to teach at UCLA. A PhD does not bestow scientific authority behind a single person, nor does one study establish scientific fact. On virtually every topic Enstrom draws conclusions that are contrary to established science. Despite his claims he is not an expert on air pollution and health. Some of his claims are in fact easily identified by health professionals as false and reveal a glaring lack of medical expertise.

A small number of people with advanced degrees making isolated claims that contradict a consensus arrived at by the rest of the scientific world, does not equate to "two sides to a debate." When thousands of scientists conclude one thing, and a small handful of contrarians conclude the opposite, the likelihood that the contrarians are the ones that have discovered the scientific truth is extremely small. Put another another way, if Mr. Enstrom is right, then pretty much the entire world's scientific community, on a wide variety of topics, is wrong. That means he is either an extraordinary visionary, or he works from a

motivation other than pure scientific discovery.

More than a decade ago, Enstrom's tobacco funding dried up, but his reputation led to his hiring by the Electrical Power Research Institute (a coal power plant lobbying group) to analyze 30 years of air pollution data. It is not a surprise that his research showed essentially no effect on mortality and has been used by the fossil fuel industry's trade groups to lobby against stricter clean air standards. In that role, he states that "fine particulate matter does not cause premature death." This is an extraordinary claim that ignores the overwhelming body of published epidemiologic research on the topic. Moreover, in his papers Enstrom claims that one of the reasons why he makes such claims is that there is no "plausible mechanism" by which air pollution can cause premature death. In doing so he reveals his lack of understanding or even awareness of all the other branches of health research: microbiology, physiology, toxicology, laboratory animal and human clinical research that support, explain and magnify the epidemiologic research he claims is flawed.

Enstrom often cites as evidence of the benignity of air pollution the claim that the average person inhales only a teaspoon or 5 gm of particulate matter in their entire life time. There is no scientific support for such a statement. In fact, a study published more than a year ago, one that he should be aware of if he were a health expert, found that at autopsy, many, if not most adult urban dwellers have more than twice that amount of pollution particles called magnetites, lodged in their brains.

Pollution particles can enter any organ and any part of the body. Some of them disintegrate or dissolve over time, some are excreted, and some remain permanently in the body. Unquestionably, for this amount of magnetite pollution to be found inside the brain at the time of death, means that many times that amount of "magnetite pollution" and many other types of pollution, particle and non-particle, are inhaled during a life time. His writings also reveal that he is unaware that air pollution particles can enter the body through oral ingestion, through the skin, the corneas, and also through the nose. By any of these routes particulate pollution will have toxic consequences just like inhalation through the lungs.

Furthermore, equating the life time mass of particulate matter inhaled is an amateurish, if not absurd means of quantifying health consequences. The toxicity of particulate matter is not a function of its mass or weight but of its surface area, and of the chemicals and heavy metals that may be attached to the particles. Indeed, the smaller the particles, the greater the toxicity because they can penetrate critical cellular membranes more easily.

Given that, Enstrom not only defies the mainstream epidemiology research on air pollution and premature mortality, but he is defacto dismissing the even greater body of research on the causal and exacerbating relationship between air pollution and many other adverse health outcomes—rates of hospital admissions, heart attacks, congestive heart failure, life threatening heart rhythms, strokes, high blood pressure, atherosclerosis progression, impaired blood lipid profile, the entire range of lung diseases, brain dysfunction and dementia, cancer, poor pregnancy outcomes, impaired fetal development, infectious diseases, and endocrine disorders like type II diabetes. UPHE has posted over 1,053 studies on our website, published just in the last ten years, demonstrating the broad range of air pollution's health consequences. This is a fraction of all the research published.

Enstrom's conclusions and advocacy contradict that entire body of research. His political advocacy for less pollution control based on his personal assessment of PM2.5 related mortality ignores the co-

existence of other proven air toxic compounds and gases, like ozone, carbon monoxide, SO2, NOx and VOCs that would, in many cases, be increased by relaxing controls on PM2.5.

An appendix to this letter is a list of just a fraction of the many studies that contradict James Enstrom's claim that air pollution does not cause increased community mortality, the overwhelming majority of them are specific to Enstrom's claim about PM2.5.

Pay particular attention to the first one on the list. This is a landmark study on air pollution and mortality, involving 61 million people from throughout the country. It is published in the most prestigious journal in the world, the New England Journal of Medicine. It significantly strengthens the association between premature death and both PM2.5 and ozone. The key findings were that levels of both pollutants, well below the EPA's standards are still strongly associated with mortality. Specifically, for every 10 ug/m3 of chronic PM2.5 exposure, mortality increased 7.3%, or .73% for every 1 ug/m3. For ozone, for every 10 ppb, the mortality increased 1.1%. However, at lower concentrations, that association was even stronger. For those people exposed to levels of PM2.5 below 12 ug/m3 (the current EPA annual standard), and below 50 ppb ozone (the current EPA standard is 70 ppb), the risk of death increased to 1.36% for every 1 ug/m3 for PM2.5, and continued at the same rate for ozone, i.e. 1% for every 10 ppb.

This is the strongest research statement yet to establish that: 1. There is no safe level of air pollution. 2. Current EPA standards are inadequate and out of step with the science. 3. The health hazard per unit off exposure is actually greater at the lowest doses. That means public policy needs to address the problem even for those cities that have relatively clean air. 4. The current EPA's attempt to delay or role back standards will do even more harm than what has been previously calculated. 5. Mr. Enstrom's conclusions cannot be defended by any reasonable review of the scientific literature.

Sincerely,

UPHE Board of Directors

Brian Moench, MD, Board Chairman
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Appendix

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