

For Immediate Release: November 24, 2015
Information: Dan Greenbaum 617 488 2331 dgreenbaum@healtheffects.org
Katherine Walker 617 488 2310 kwalker@healtheffects.org

**NEW REPORT EXAMINES LATEST STUDIES OF LUNG CANCER RISK IN WORKERS
EXPOSED TO EXHAUST FROM OLDER DIESEL ENGINES:
*Studies Withstand Scrutiny, Require Care in Efforts to Calculate Risk***

An Expert Panel of the [Health Effects Institute](http://www.healtheffects.org) (HEI¹) has completed its intensive review and analysis of two key recent studies of mine and trucking industry workers exposed to exhaust from older diesel engines. In a report issued today, HEI's Diesel Epidemiology Panel concluded that the studies met high standards of scientific research and could be useful for estimating lung cancer risks due to exposures to older diesel engine exhaust. The Panel noted, however, that efforts to apply these studies to estimate human risk at today's ambient levels will need to consider the study's limitations, and the much lower levels of particulate emissions from newer diesel technology engines.

In the wake of the decision in 2012 by the International Agency for Research on Cancer (IARC, an arm of WHO) to categorize diesel exhaust as a known human carcinogen, HEI was asked by its sponsors in the US EPA and industry to assess whether the two studies, which played a central role in IARC's decision, could be used for quantitative risk assessment,² a key in deciding whether and how to set limits that protect public health.

HEI appointed a nine-member Diesel Epidemiology Panel chaired by Daniel Krewski, Professor of Epidemiology at the University of Ottawa, and an internationally recognized authority in risk assessment (full panel below). The Panel examined two major studies: the [Diesel Exhaust in Miners Study](#) (DEMS) conducted by the National Cancer Institute (NCI) and the National Institute for Occupational Safety and Health (NIOSH) that studied a cohort of more than 12,000 male U.S. nonmetal miners; and the [Trucking Industry Particle Study](#) (Truckers) led by a team of researchers at Boston VA Healthcare System, Brigham and Women's Hospital, and Harvard T.H. Chan School of Public Health that examined a cohort of about 31,000 male workers employed in the unionized U.S. trucking industry.

To reach its conclusions, the Panel carefully evaluated both studies, holding a public meeting to air diverse views on the studies, conducting new analyses of the DEMS data, and reviewing critiques and new analysis that had raised questions about the studies. The Panel's draft report underwent extensive peer review by scientists not involved in the studies; they also responded to comments received from both the original investigators of both studies and the industry-supported analysts.

¹ The Health Effects Institute is an independent, non-profit research institute funded jointly by the US Environmental Protection Agency and industry to provide credible, high quality science on air pollution and health for air quality decisions. HEI sponsors do not participate in the selection, oversight or review of HEI science, and HEI's reports do not necessarily represent their views.

² Quantitative risk assessment is a critical step in estimating the risk of adverse health effects that might result when people are exposed to different levels of pollutants;

The Panel concluded that both studies were well-designed and carefully conducted, embodying the attributes of epidemiological studies that are considered important for quantitative risk assessment. They were designed to address most, if not all, of the major limitations of previous epidemiologic studies of diesel exhaust and lung cancer: i.e. the quality and specificity of exposure measurements used to represent diesel exhaust, the lack of quantitative estimates of personal exposure estimates for the whole study period, and the inability of previous studies to account for exposures that might otherwise explain the relationship observed between diesel exhaust and lung cancer, in particular individual smoking.

The Panel also recognized a number of limitations, or sources of uncertainty, in each of the studies that warrant consideration in their use for quantitative risk assessment. For example, given the limited availability of actual measurements of exposures in both studies, the actual exposures experienced cannot be known with certainty. Additionally, the Truckers cohort study did not have information on individual workers' smoking habits but instead had less specific information on smoking behaviors in various job groups. The limitations, in the Panel's view, did not ultimately undermine the basic integrity of the studies, their findings, and their ability to contribute to understanding the magnitude of diesel-exhaust related lung cancer risk.

Although the Panel considered the evidence generated by these studies to be informative for estimating the risk of human lung cancer in relation to exposure to diesel exhaust, it recognized that the studies are only part of a more comprehensive quantitative risk assessment process that would typically include other scientific evidence, as well as other analyses to understand how to translate risk estimates from these predominantly male, white workers, exposed to exhaust from old diesel engines during a working lifetime, to lifetime or less than lifetime exposures to diesel exhaust in the general population today. Future risk assessment would also need to take into account the declining levels and changing characteristics of diesel exhaust that have occurred in response to a long history of regulations of diesel engines and technology advancement and would differ notably from those in the miners and truckers studies.

Health Effects Institute Diesel Epidemiology Panel

Daniel Krewski, PhD *Chair*, McLaughlin Centre for Population Health Risk Assessment, University of Ottawa

Paul Demers, PhD, Director Occupational Cancer Research Centre, Cancer Care Ontario

David Foster, PhD, Professor Emeritus, Department of Mechanical Engineering, University of Wisconsin Madison

Joel Kaufman, MD, MPH, Professor, Environmental and Occupational Health Sciences; Director of the Occupational and Environmental Medicine Program, School of Public Health, University of Washington

Jonathan Levy, ScD, Professor and Associate Chair, Department of Environmental Health, Boston University School of Public Health

Charles Poole, ScD, MPH, Associate Professor, Department of Epidemiology, University of North Carolina School of Public Health

Nancy Reid, PhD, University Professor of Statistics, Department of Statistics, University of Toronto

Martie van Tongeren, PhD, Director of Centre for Human Exposure Science Institute of Occupational Medicine, Edinburgh, Scotland, UK

Susan R. Woskie, Ph.D., C.I.H., Professor, Department Work Environment, University of Massachusetts Lowell