

To: Dr. William J. Martin
Director, National Institute of Environmental Health Sciences
From: John Walsh
President & CEO, COPD Foundation
RE: Comments on the Global Environmental Health Workshop Report
Date: August 1, 2007

On behalf of the COPD Foundation, I applaud the National Institute of Environmental Health Services (NIEHS) for assembling a distinguished panel of scientists in January 2007 to issue a report to help identify important areas of research as it relates to global environmental health. We have reviewed the workshop report and believe it makes an important contribution towards addressing significant areas of environmental health. We believe that the significant array of respiratory diseases that fall under the rubric of chronic obstructive pulmonary disease (COPD) is a large and growing health threat both within the United States and globally and should be given priority consideration for additional research within the context of NIEHS' global environmental health initiative. With regard to COPD, we believe there is a need for additional translational research to test proven interventions for their effectiveness in various community settings; we believe there is a need for additional research to test the efficacy of plausible interventions; and, research to understand the mechanisms in the biological basis of environmentally related diseases.

COPD is the 4th leading cause of death in the United States and without appropriate interventions will become the 3rd leading cause of death in the country by 2020. It is estimated that one person dies every four minutes in the U.S. from COPD. The symptoms of COPD are breathlessness, chronic coughing, wheezing, tightness in the chest and frequent clearing of the throat. The National Heart Lung and Blood Institute estimates that 12 million adults have COPD in the U.S. and another 24 million are undiagnosed or developing the disease. Worldwide it is estimated that over 600 million people have COPD and women are disproportionately affected.

COPD is a costly disease. In developed countries COPD accounts for a significant burden on the health care system. This disease costs the U.S. economy \$32 billion in direct and indirect costs annually with up to 84% of the direct costs associated with hospitalization. In the European Union, the total direct cost of respiratory diseases are estimated to be about 6% of the total health care expenditures, with COPD accounting for 56% (or 38.6 billion Euros) of this total cost. In the developing world, not only is population continuing to grow at faster rates than the developed world, but also the level of air pollution and exposure to environmental airborne toxins is significantly greater than in the rest of the world. Five developing countries in the world—China, India, Bangladesh, Indonesia and Pakistan will represent over 50% of the world's population by the year 2050. These countries are growing rapidly as is their proportion of elderly citizens. By mid century most of the elderly people of the world will be located in these five countries. As a consequence, many of the chronic diseases, such as COPD, will be dramatically overrepresented in these Asian countries.

COPD risk factors, other than smoking, include ambient and indoor air pollution as well as occupational exposures. Occupational chemicals and occupational exposure to organic dust such as cotton, flax, hemp, jute, sisal and various grains are COPD risk factors as is smoke from biomass combustion. Exposures to toxic substances such as metals (lead, mercury, cadmium, and arsenic), solvents (benzene, formaldehyde), air pollutants (from burning fuel and pesticides) have all been identified as environmental health risk factors. The American Thoracic Society reports in a 2003 review of the literature that approximately 15% of both asthma and COPD is likely to be related to occupational exposure. While occupational exposure and general environmental exposures are often considered separately as policy issues, the concept of total personal exposure to air toxins may be more relevant to preventing and controlling the effects of COPD.

To bring the level of exposure under control, and to facilitate the adoption of necessary policy changes and interventions, additional evidence based science and research will be necessary. In the view of the COPD scientific leadership, a clear and compelling agenda for additional environmental COPD research is well established. For example, while cigarette smoke is well documented as a cause of COPD and an agent which worsens the condition, epidemiologic studies of the effects of cigarette smoke cannot pinpoint the specific etiologic role of any of its constituent elements. Longitudinal studies have been performed that document the association between COPD and occupational exposures for coal miners, hard rock miners, tunnel workers, and concrete manufacturing workers. Nevertheless, little is understood as to the exact biological process by which these exposures cause and aggravate the COPD condition.

The NHLBI Division of Lung Diseases has sponsored several COPD workshops that have recommended additional research be focused on the disease process, pathogenesis, and therapy. Several of the specific recommendations made by the Division of Lung Disease sponsored workshops include: 1) the creation of a system for the standardized collection, processing, and distribution of lung tissue specimens and associated clinical and laboratory data; 2) the development of standards for the classification and staging of COPD; 3) the characterization of the development and progression of COPD using measures and biomarkers that relate to current concepts of pathogenesis; and 4) the evaluation of indications for long-term oxygen therapy for patients with COPD.

Finally, we would like to comment on the Rank Order of Research Projects table (pg. 51) that appears in the summary section of the NIEHS report. In our view, research option 2 (acute respiratory infections & IAP/OAP), research option 5 (asthma & IAP/OAP), and research option 11 (COPD & IAP/OAP) are all really a part of COPD and by diffusing or separating these elements of COPD the result seems to be to down grade the priority of COPD. As most exacerbations of COPD are related to ARI's, we would recommend bundling asthma, ARI's, and COPD into one research project and move the bundled project very high on the priority list.

Thank you for this opportunity to provide these comments that we hope you will find useful in prioritizing research to be encompassed the NIEHS Global Environmental Health Initiative.