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Testimony  
before the  
Committee on Veterans' Affairs  
United States Senate

Statement of  
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Mr. Chairman and distinguished members of the Committee—I am pleased to appear before you today to present testimony on the relationship between dioxin exposure and the risk of ischemic heart disease. My name is Linda Birnbaum; I am the Director of the National Institute of Environmental Health Sciences (NIEHS), of the National Institutes of Health, an agency of the Department of Health and Human Services, and Director of the National Toxicology Program (NTP), an interagency program, housed at NIEHS, whose mission is to evaluate agents of public health concern by developing and applying tools of modern toxicology and molecular biology. The program maintains an objective, science-based approach in dealing with critical issues in toxicology and is committed to using the best science available to prioritize, design, conduct, and interpret its studies.

Understanding the role that environmental and occupational exposures play in the development of chronic diseases can be challenging, particularly for diseases that have significant risk factors in addition to the chemical exposure. Thus, the task of estimating the quantitative role of Agent Orange and dioxin exposure in the development of ischemic heart disease in Vietnam Veterans is clouded by the contributions of other risk factors such as age, smoking, family history, body mass index, serum lipid concentrations, and other factors. In 2008, my colleagues and I published a systematic review that evaluated the evidence of an association between dioxin exposure and cardiovascular disease mortality in humans. We found that the studies in the highest-quality group found consistent and significant dose-related increases in ischemic heart disease mortality and concluded that there is an association between dioxin exposure and mortality from ischemic heart disease and cardiovascular disease.

Similarly, the Institute of Medicine (IOM) concluded in 2008 that there is limited or suggestive evidence of an association between Agent Orange or dioxin exposure and ischemic heart disease. The IOM based this decision on an approach that used all the available data from epidemiological, toxicological, and mechanistic studies. There are several challenges and limitations of the toxicological and epidemiological studies. In experimental animals, dioxin

increases the severity and incidence of cardiomyopathy that is already present in aging rats. Similarly in humans, dioxin is not causing a unique cardiovascular disease, but increases the risk of developing ischemic heart disease, which has a significant background incidence. Thus there are a number of other risk factors that can influence the development of this disease. The epidemiological studies that the IOM evaluated and considered in their recommendations for ischemic heart disease varied considerably in their attempts to adjust or control for all the major risk factors of ischemic heart disease, such as, age, smoking, high blood pressure, diabetes and obesity. It should be noted that few of the studies attempted to control for all of these major risk factors. Also, the epidemiological studies have not attempted to compare the attributable risks of developing ischemic heart disease from dioxins to these other risk factors and have not reported the data in a manner that would allow the quantification of these comparisons. It may be possible to obtain some of this data and reanalyze it in order to address these questions. However, at present this analysis is not available.

The timing of exposure is another question that arises in evaluating risk. The window of possible exposure during service in Vietnam adds a level of uncertainty to the actual exposure estimates that are based on blood levels measured much later on. It is also unclear from the studies available to us how much risk remains many years after exposure. At least one study, the Australian Department of Veterans Affairs study of Vietnam War Veterans in that country, observed a pattern of increased risk for ischemic heart disease with time. In contrast, while there was an increase in the incidence of cardiovascular disease in Seveso, Italy, shortly after the 1976 accident there that resulted in widespread dioxin exposure, this effect dissipated over time.

A number of review activities in this area, by different agencies of the U.S. Government as well as the National Academy of Sciences (NAS) and the IOM, have generated comprehensive reviews of the risks of dioxin exposure. For instance, In 2008, the EPA released a literature search entitled “2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD) Dose-Response Studies: Preliminary Literature Search Results and Request for Additional Studies”, as part of an ongoing update of the Dioxin Reassessment. This literature search was reviewed by an outside panel of experts at a workshop to ensure that the all appropriate studies were identified, with special emphasis on the latest literature. The summary from this workshop, held on February 18-20, 2009, in Cincinnati, Ohio, was released by the EPA in June 2009. In addition, the IOM’s report entitled Veterans and Agent Orange: Update 2008 also provides a comprehensive and reliable source for the most current data on the health risks of dioxin exposure.

Thank you for inviting me to testify. I would be happy to answer any questions.