EXECUTIVE SUMMARY

Nearly one in two men and more than one in three women in the United States will be diagnosed with cancer at some point in his or her lifetime. Cancer is now the leading cause of death for individuals under age 85. Even though tobacco remains the single most significant preventable cause of cancer, it has been linked neither to the majority of cancers nor to many of the cancers that have increased rapidly in recent decades including melanoma, lymphomas, testicular, brain, and bone marrow cancers.

This paper summarizes recent scientific evidence of environmental and occupational links to nearly 30 types of cancer. It includes a critique of the 25 year-old analysis by Doll and Peto and subsequent analyses that attribute an extremely small fraction of cancer deaths to involuntary environmental and occupational exposures. The paper presents the state of the evidence on causal associations between environmental and occupational exposures and specific cancer types. The discussion of each cancer type is introduced by highlights of trends in incidence and mortality rates. Lastly, the paper considers additional indications that involuntary exposures are linked to cancers, such as patterns observed in different geographic areas and among different populations, including patterns of cancer in children.

The authors cite several notable findings:

- Cancer evolves from a complicated combination of multiple exposures. Attempting to assign certain exposures (i.e. diet, smoking, environment, etc.) certain roles in causing cancer that will total 100% is inappropriate given that no one exposure single-handedly produces cancer and many causes of cancer are still unknown. Comprehensive cancer prevention programs need to reduce exposures from all avoidable sources. Cancer prevention programs focused on tobacco use, diet, and other individual behaviors disregard the lessons of science.
- Examples of strong causal links between environmental and occupational exposures and cancer include:
  - Metals such as arsenic and cancers of the bladder, lung, and skin.
  - Chlorination byproducts such as trihalomethanes and bladder cancer.
  - Natural fibers such as asbestos and cancers of the larynx, lung, mesothelioma, and stomach.
  - Petrochemicals and combustion products, including motor vehicle exhaust and polycyclic aromatic hydrocarbons, and cancers of the bladder, lung, and skin.
  - Pesticide exposures and cancers of the brain, Wilms tumor, leukemia, and non-Hodgkin's lymphoma.
  - Reactive chemicals such as vinyl chloride and liver cancer and soft tissue sarcoma.
  - Metalworking fluids and mineral oils with cancers of the bladder, larynx, nasal passages, rectum, skin, and stomach.
  - Ionizing radiation and cancers of the bladder, bone, brain, breast, liver, lung, ovary, skin, and thyroid, as well as leukemia, multiple myeloma, and sarcomas.
  - Solvents such as benzene and leukemia and non-Hodgkin's lymphoma; tetrachloroethylene and bladder cancer; and trichloroethylene and Hodgkin's disease, leukemia, and kidney and liver cancers.
  - Environmental tobacco smoke and cancers of the breast and lung.

The sum of the evidence regarding environmental and occupational contributions to cancer justifies urgent acceleration of policy efforts to prevent carcinogenic exposures. By implementing precautionary policies, Europeans are creating a model that can be applied in the U.S. to protect public health and the environment. To ignore the scientific evidence is to knowingly permit tens of thousands of unnecessary illnesses and deaths each year.