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## **Environmental and occupational causes of cancer: new evidence 2005-2007.**

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What do we currently know about the occupational and environmental causes of cancer? As of 2007, the International Agency for Research on Cancer (IARC) identified 415 known or suspected carcinogens. Cancer arises through an extremely complicated web of multiple causes, and we will likely never know the full range of agents or combinations of agents. We do know that preventing exposure to individual carcinogens prevents the disease. Declines in cancer rates—such as the drop in male lung cancer cases from the reduction in tobacco smoking or the drop in bladder cancer among cohorts of dye workers from the elimination of exposure to specific aromatic amines—provides evidence that preventing cancer is possible when we act on what we know. Although the overall age-adjusted cancer incidence rates in the United States among both men and women have declined in the last decade, the rates of several types of cancers are on the rise; some of which are linked to environmental and occupational exposures. This report chronicles the most recent epidemiologic evidence linking occupational and environmental exposures with cancer. Peer-reviewed scientific studies published from January 2005 to June 2007 were reviewed, supplementing our state-of-the-evidence report published in September 2005. **Despite weaknesses in certain individual studies, we consider the evidence linking the increased risk of several types of cancer with specific exposures somewhat strengthened by recent publications, among them brain cancer from exposure to non-ionizing radiation, particularly radiofrequency fields emitted by mobile telephones;** breast cancer from exposure to the pesticide dichlorodiphenyltrichloroethane (DDT) before puberty; leukemia from exposure to 1,3-butadiene; lung cancer from exposure to air pollution; non-Hodgkin's lymphoma (NHL) from exposure to pesticides and solvents; and prostate cancer from exposure to pesticides, polyaromatic hydrocarbons (PAHs), and metal working fluids or mineral oils. In addition to NHL and prostate cancer, early findings from the National Institutes of Health Agricultural Health Study suggest that several additional cancers may be linked to a variety of pesticides. Our report also briefly describes the toxicological evidence related to the carcinogenic effect of specific chemicals and mechanisms that are difficult to study in humans, namely exposures to bis-phenol A and epigenetic, trans-generational effects. To underscore the multi-factorial, multi-stage nature of cancer, we also present a technical description of cancer causation summarizing current knowledge in molecular biology. **We argue for a new cancer prevention paradigm, one based on an understanding that cancer is ultimately caused by multiple interacting factors rather than a paradigm based on dubious attributable fractions.** This new cancer prevention paradigm demands that we limit exposure to avoidable environmental and occupational carcinogens, in combination with additional important risk factors like diet and lifestyle. The research literature related to environmental and occupational causes of cancer is constantly growing, and future updates will be carried out in light of new biological understanding of the mechanisms and new methods for studying exposures in human populations. **The current state of knowledge is sufficient to compel us to act on what we know.** We repeat the call of ecologist Sandra Steingraber: "**From the right to know and the duty to inquire flows the obligation to act.**"