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FOR RELEASE: WEDNESDAY, MARCH 10, 1999

Largest Human Study Finds No Link Between PCB Exposure and Cancer Mortality

*Journal of Occupational and Environmental Medicine
Publishes Study Showing Cancer Death Rates of Exposed Workers
At or Below That of General Population*

WASHINGTON, D.C. — In the largest-ever human study of its kind, researchers Renate D. Kimbrough, M.D., and Martha L. Doemland, Ph.D., have found no association between actual human exposure to PCBs (polychlorinated biphenyls) and deaths from cancer or any other diseases.

For more than 20 years, the federal government has characterized PCBs as probable human carcinogens based in part on Dr. Kimbrough's 1975 study of PCBs in rats that were fed large quantities of PCBs in their diets.

"This new study provides strong evidence that even long-term human exposure to PCBs at higher levels than are found in the environment is not related to an increase in deaths from cancer or any other diseases," said Dr. Kimbrough, the study's principal investigator and a senior medical associate with the non-profit Institute for Evaluating Health Risks in Washington, D.C.

The new study is published in the March issue of the peer-reviewed *Journal of Occupational and Environmental Medicine*, published by the American College of Occupational and Environmental Medicine.

The findings of this study are consistent with those of four other studies of the same population conducted by other researchers over nearly 25 years, but the new study is the largest and most statistically powerful study ever conducted of humans exposed to PCBs.

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The mortality study focused on the 7,075 men and women who worked between 1946 and 1977 in two Upstate New York General Electric Co. factories which used PCBs in the manufacture of electrical capacitors. The study compared to national and regional averages the number and causes of death for the 1,195 members of the study population who died.

The average follow-up time for the 7,075 workers was 31 years, providing a sufficiently long latency period in which to determine whether there was any increase in cancer mortality.

Some of the workers in the study had PCB levels in their blood as high as several thousand parts per billion. In the United States, the average PCB levels found in the blood of people who have been tested range from 4 to 8 parts per billion (ppb), according to the Agency for Toxic Substances and Disease Registry.

Dr. John A. Moore, president of IEHR, former assistant administrator and acting deputy administrator of EPA and former deputy director of the National Toxicology Research and Testing Program, NIEHS, National Institutes of Health, said:

"The findings of this study are consistent with a belief that cancer risks from exposure to PCBs have been overstated. The newer laboratory data of the past several years support such a view and also prompted the EPA to reduce the factors they use to estimate PCB cancer risks."

Dr. Arthur C. Upton, former director of the National Cancer Institute and currently a professor at the Robert Wood Johnson Medical School, said of the study:

"This is a significant study that should be factored into any public discussion of PCBs and human health. Dr. Kimbrough and her colleagues were meticulous in their efforts to gather and verify information on the 7,075 individuals who were part of the investigation. The analysis of the data and conclusions are scientifically appropriate and the authors are to be complemented on the high quality of their study and report as well as the publication that was prepared from this information."

Dr. Upton chaired a five-member advisory committee that IEHR established to review the design, execution, analysis and interpretation of the study.

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"This was a well-designed and carefully conducted study," said Dr. Jack Mandel, an epidemiologist and professor and director of Environmental and Occupational Health at the University of Minnesota.

Dr. Mandel, who also served on the review panel, commended Drs. Kimbrough's and Doemland's determination to examine the records of each of the more than 7,000 people who had worked in the electrical equipment factories for at least 90 days over a 30-year period, noting that they had even found 783 workers not included in previous studies.

The new study's findings are consistent with shorter-term studies of workers in the same factories that were conducted by the National Institute for Occupational Safety and Health, Harvard School of Public Health and the New York State Department of Health, and the Mt. Sinai School of Medicine.

Dr. Kimbrough, a doctor of medicine with special training in pathology, was formerly with the U.S. Environmental Protection Agency, the Centers for Disease Control and the Food and Drug Administration.

Dr. Doemland, who earned her doctorate at the State University of New York at Buffalo, is an epidemiologist with the Institute for Evaluating Health Risks.

Drs. Kimbrough and Doemland were assisted by Maurice E. LeVois, Ph.D., formerly with the Institute for Evaluating Health Risks, the Centers for Disease Control and the Agent Orange research and education program of the Veterans' Administration in Washington.

The Institute for Evaluating Health Risks conducted the study at the request of and with funding from the General Electric Co., which operates the New York State businesses where the workers were employed. GE had no role of any kind in the conduct of the study, the evaluation of the data or the conclusions drawn, Dr. Kimbrough said.

The Institute does scientific analysis for both government and private-sector organizations.

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Major Findings of Dr. Renate D. Kimbrough's Study of Mortality in Male and Female Capacitor Workers Exposed to Polychlorinated Biphenyls (PCBs).

It is the largest and longest-running epidemiology study of humans exposed to PCBs involving 7,075 men and women who were exposed to PCBs on the job at two New York State electrical equipment factories.

Hourly and salaried employees with at least 90 days' employment in the factories between 1946 and 1977 were studied. Dr. Kimbrough's team compared the employees' records against national and regional mortality statistics, which were used to calculate an expected death rate and cancer incidence rate based on such factors as gender and age.

Major findings:

- The workers' exposure to PCBs resulted in significantly higher blood levels of PCBs than are found in the general population, based on historical data of the same worker population.
- Among all the workers, including those most highly exposed to PCBs, no statistically significant increase in deaths due to cancer or any other disease was detected, nor were statistically significant increases or decreases in mortality associated with length of employment or latency.
- Among the workers, the death rate due to all types of cancer combined was at or significantly below the expected level.
- Based on national death rates, 699 and 420 deaths were "expected" among the hourly male and female workers, respectively. Only 586 and 380 deaths, respectively, were observed.
- Based on regional death rates, 713 deaths among hourly male workers and 449 deaths among hourly female workers would have been expected. Again, only 586 and 380 deaths, respectively, were observed.