

# HEALTH BULLETIN

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## **Cancer Study in Electric Utility Workers Exposed to Electric and Magnetic Fields**

A new study of electric utility workers at the Southern California Edison Company was published in the March 1993 issue of the journal Epidemiology (4:104-14, 1993). In this study, investigators wanted to determine if electric utility workers who had been exposed to electric and magnetic fields (EMF) had higher rates of death due to cancer when compared to workers who were not occupationally exposed to EMF. The study group consisted of 36,221 employees who worked at Southern California Edison Company for at least 1 year between 1960 and 1988. In previous health-related studies on EMF exposure, workers were not monitored for EMF exposure. Consequently, their jobs were classified only by estimated levels of EMF exposure. Investigators in this study hoped to improve on previous studies by collecting better EMF exposure information and classifying workers accordingly.

Workers who were classified as "exposed" held jobs that required work near functioning (energized) electrical equipment. These jobs included electric power generation station and substation plant operators, linemen, welders, electricians, mechanics, machinists, and technicians. The comparison group (of unexposed workers) who were also nonmanagement workers, generally held nonelectrical type jobs. The exposed and the unexposed workers were then matched with one another with respect to age, sex, race, and longevity (factors that could mask any differences between the causes of death). This type of matching was done for better comparability between the exposed and unexposed workers. The more similar the two groups of workers were with respect to these factors, the less likely a factor interfered with the ability of the investigators to detect any relationship between EMF exposure and death due to cancer. The investigators determined each worker's vital status (whether the

worker had died). For deceased workers, cause-of-death was ascertained from death certificates.

In order to estimate the amount of EMF exposure that the workers in the study group experienced during a typical work day, the investigators collected magnetic field measurements from a representative sample of current workers in a variety of different occupations and work locations. They then used these measurements to estimate past EMF exposure for the entire study group.

The authors found no strong relationship between EMF exposure and death rates due to cancer. Because of the relatively small number of cancer deaths in their study group, the investigators could not rule out the possibility of a link between EMF exposure and death due to cancer. The ability of the investigators to detect a difference in cancer death rates between the EMF exposed and unexposed groups of workers was dependent on two critical factors: (1) how large an effect EMF exposure actually had on cancer death rates; and (2) the size of the study group. The larger the study population, the better the chances of detecting the influence of an exposure. In this study, the sample size of only 36,221 electric utility workers may not have been large enough to test the extent to which EMF exposure may influence cancer death rates.

This Health Bulletin is one in a series of routine publications issued by the Office of Health to share data from health studies throughout the DOE complex. The authors' conclusions do not necessarily reflect those of the Department. For more information contact: Patricia Barbosa, Health Communication and Coordination Division, Office of Epidemiology and Health Surveillance, U.S. Department of Energy, Washington, D.C. 20585; telephone (301) 903-7771.