

INFANT MORTALITY AROUND THREE NUCLEAR POWER REACTORS

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A part of the continuing epidemiologic research program on the effects of radiation exposure to humans is the occasional use of published vital statistics data to test the validity of the magnitude of a specific risk which has been proposed. The difficulties inherent in using vital statistics data to test a hypothesis of an association of a specific disease entity with radiation exposure are well recognized by our staff. None of the disease conditions which have been identified as being possible long term effects of exposure to radiation are unique, and therefore, no inferences about changes in rates of a specific disease following exposure can be made without looking at all of the factors which are known to influence the occurrence of that disease. However, occasionally, the magnitude of risk which has been proposed to be associated with radiation exposure is so large that it is possible to do a qualitative study. It can be hypothesized that if the risk of a specific effect associated with exposure is large enough, a change in the rate in the vital statistics data should be detectable despite all the other factors which might be influencing that effect.

In the papers presented by Dr. Ernest J. Sternglass and Dr. Morris H. DeGroot at this symposium, it has been suggested that the developing fetus is so uniquely sensitive to radiation damage that relatively very low levels of exposure to radiation from the operation of nuclear power plants are reflected in fairly large increases in infant mortality. If this is true, one can hypothesize that a comparison of infant mortality rates around a nuclear power plant before and after the beginning of operation should show differences in rates graded according to the distance from the plant. Increases in rates can be expected close to the facility with no change or decreases in rates at remote distances.

Three nuclear power facilities were selected for study: the Humboldt Bay Plant Unit 3 at Eureka, California; the Dresden Nuclear Power Station Unit 1 at Morris, Illinois; and the Big Rock Point Nuclear Power Station at Charlevoix, Michigan. These reactors were selected because they were among the first plants to be constructed and therefore provide data for several years of infant mortality experience since they began operation. In addition, they are all boiling water reactors with subsequent higher rates of radioactive gas discharge to the environment as compared to discharges from pressurized water reactors. These plants, therefore, have a history of the highest potential exposure to the popula-