

# Thyroid Cancer and Exposure from Nuclear Testing Fallout in Illinois

**Some information suggests that exposure to nuclear bomb fallout is associated with an elevated risk for thyroid cancer.**

Recently, the National Cancer Institute (NCI) released the findings of a study that sought to estimate the amount of iodine-131 to which an individual's thyroid might have been exposed as a result of the atmospheric nuclear bomb tests that took place in Nevada in the 1950s. Ninety tests were conducted at the Nevada Nuclear Test Site, with most occurring in the years, 1952, 1953, 1955 and 1957. Since iodine-131 has an eight-day half-life, exposure to these releases had to have occurred primarily in the two-month period following each test. The report states that persons living in fallout areas would have received the greatest exposure from milk consumption; children, because they drink the largest quantities of milk and their thyroids are smaller, probably received the highest doses.

The average per capita exposures in Illinois counties ranged from 1.6 to 7.6 rads.

Thyroid cancer occurs twice as often in women as in men and is found most often in young adults. We examined the rates of thyroid cancer in Illinois counties in relation to county estimates of average doses of iodine-131. The estimates of the per capita average individual doses of iodine-131 exposure were obtained from the study, which is available on NCI's web site (<http://rex.nci.nih.gov>). The available tables listed the total estimated exposure, exposure attributable to milk consumption, and the population size for each county in Illinois.

The cancer data was obtained from the Illinois State Cancer Registry for 1986 through 1994. The cases were aggregated by age, sex and

county. Rates were computed and age-adjusted to the 1970 U.S. population. Age-specific rates for those groups that were most likely to have been children (younger than 20 years old) in the 1950s also were computed. An analysis of the association between exposure and disease rates was conducted using both unweighted and weighted least squares linear regressions, with the weight in the latter defined by the square root of the population size. This was done for all cases, males, females and also the specific age categories of 35 to 44 year olds, 45 to 54 year olds, and 55 to 64 year olds.

No evidence was found that the exposure rates in Illinois were associated with the incidence of thyroid cancer from 1986 to 1994. However, several points about this analysis need to be considered. One, only 37 percent of the thyroid cancer case reports contained information that the individuals

were born in Illinois. Nor does the information imply that the case was still living in the same county in which he or she was born. Two, persons who moved from Illinois to another state before a diagnosis of thyroid cancer could not be identified from the database. Both these limitations weaken the ability to identify an association, particularly when the disease is rare and the numbers of cases are small. Further, the precision of the average county exposure estimates varied significantly; some had error estimates as great as the estimate of exposure itself. Finally, incidence of thyroid cancer before 1986 is not available since those years predate the state cancer registry.

*Howe HL. Thyroid cancer and exposure from nuclear testing fallout in Illinois. Health and Hazardous Substances Registry Newsletter (Illinois Department of Public Health) Fall 1997:2.*

