

1. JAMA. 1991 Mar 20;265(11):1397-402.

Mortality among workers at Oak Ridge National Laboratory. Evidence of radiation effects in follow-up through 1984.

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Erratum in

JAMA 1991 Aug 7;266(5):657.

JAMA 1992 Sep 16;268(11):1414.

Comment in

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JAMA. 1992 Feb 19;267(7):929-30.

White men hired at the Oak Ridge (Tenn) National Laboratory between 1943 and 1972 were followed up for vital status through 1984 (N = 8318, 1524 deaths).

Relatively low mortality compared with that in US white men was observed for most causes of death, but leukemia mortality was elevated in the total cohort (63% higher, 28 deaths) and in workers who had at some time been monitored for internal radionuclide contamination (123% higher, 16 deaths). Median cumulative dose of external penetrating radiation was 1.4 mSv; 638 workers had cumulative doses above 50 mSv (5 rem). After accounting for age, birth cohort, a measure of socioeconomic status, and active worker status, external radiation with a 20-year exposure lag was related to all causes of death (2.68% increase per 10 mSv) primarily due to an association with cancer mortality (4.94% per 10 mSv). Studies of this population through 1977 did not find radiation-cancer mortality associations, and identical analyses using the shorter follow-up showed that associations with radiation did not appear until after 1977. The radiation-cancer dose response is 10 times higher than estimates from the follow-up of survivors of the bombings of Hiroshima and Nagasaki, Japan, but similar to one previous occupational study. Dose-response estimates are subject to uncertainties due to potential problems, including measurement of radiation doses and cancer outcomes.

Longer-term follow-up of this and other populations with good measurement of protracted low-level exposures will be critical to evaluating the generalizability of the results reported herein.

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