

Plutonium-Related Work and Cause-Specific Mortality at the United States Department of Energy Hanford Site

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ABSTRACT

Background Health effects of working with plutonium remain unclear. Plutonium workers at the United States Department of Energy (US-DOE) Hanford Site in Washington State, USA were evaluated for increased risks of cancer and non-cancer mortality.

Methods Periods of employment in jobs with routine or non-routine potential for plutonium exposure were identified for 26,389 workers hired between 1944 and 1978. Life table regression was used to examine associations of length of employment in plutonium jobs with confirmed plutonium deposition and with cause specific mortality through 1994.

Results Incidence of confirmed internal plutonium deposition in all plutonium workers was 15.4 times greater than in other Hanford jobs. Plutonium workers had low death rates compared to other workers, particularly for cancer causes. Mortality for several causes was positively associated with length of employment in routine plutonium jobs, especially for employment at older ages. At ages 50 and above, death rates for non-external causes of death, all cancers, cancers of tissues where plutonium deposits, and lung cancer, increased 2.0+/-1.1%, 2.6+/-2.0%, 4.9+/-3.3%, and 7.1+/-3.4% (+/-SE) per year of employment in routine plutonium jobs, respectively.

Conclusions Workers employed in jobs with routine potential for plutonium exposure have low mortality rates compared to other Hanford workers even with adjustment for demographic, socioeconomic, and employment factors. This may be due, in part, to medical screening. Associations between duration of employment in jobs with routine potential for plutonium exposure and mortality may indicate occupational exposure effects.

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