

**Abstract:**

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**Meta-analysis of standardized incidence and mortality rates of childhood leukaemia in proximity to nuclear facilities**

The meta-analysis combined and statistically analysed studies of childhood leukaemia and nuclear facilities. Focus was on studies that calculated standardized rates for individual facilities. Due to variability between study designs, eight separate analyses were performed stratified by age and zone. One hundred and thirty-six sites were used in at least one analysis. Unadjusted, fixed effects and random effects models were used. Meta-rates greater than one were found in all models at all stratification levels often achieving statistical significance. Caution must be used when interpreting these results. The meta-analysis was able to show an increase in childhood leukaemia near nuclear facilities, but does not support a hypothesis to explain the excess. Each type of model utilized has limitations. Fixed effects models give greater weight to larger studies; however, population density may be a risk factor. Random effects models give greater weight to smaller studies that may be more likely to be affected by publication bias. A limitation of the overall study design is that standardized rates must be available for individual sites which led to exclusion of studies that only calculated rates for multiple sites and those that presented other statistical methods. Further, dose-response studies do not support excess rates found near nuclear facilities. However, it cannot be ignored that the majority of studies have found elevated rates, although not usually statistically significant.

**Keywords:** [childhood leukaemia](#); [nuclear](#); [radiation](#); [meta-analysis](#)

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