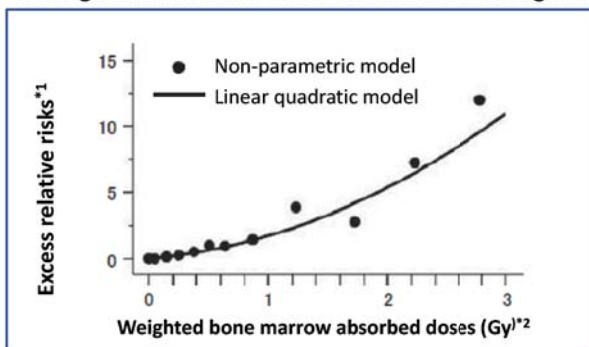**Cancer due to Acute External Exposure**

Dose-response Relationship of Radiation-induced Leukemia

Data on Atomic Bomb Survivors

Dose-response relationship of radiation-induced leukemia among atomic bomb survivors in Hiroshima and Nagasaki

*1: An indicator to show increments in the mortality rate (or incidence rate) in the case of having been exposed to radiation against the mortality rate (or incidence rate) in the case of having been free from radiation exposure; showing how many times increase was caused by radiation exposure

*2: In the case of leukemia, weighted bone marrow doses (sum of 10 times the neutron doses and total amount of γ-rays) are used.

Source: Prepared based on Wan-Ling Hsu et al. The Incidence of Leukemia, Lymphoma and Multiple Myeloma among Atomic Bomb Survivors: 1950–2001, Radiation Research 179, 361–382 (2013)

Surveys targeting atomic bomb survivors made it clear that the dose-response relationship of leukemia, excluding chronic lymphocytic leukemia and adult T-cell leukemia, is quadric, and the higher an exposure dose is, the more sharply risks increase, showing a concave dose-response relationship (the linear quadratic curve in the figure). On the other hand, risks posed by low-dose exposure are considered to be lower than estimated based on a simple linear dose-response model.

In the figure above, black dots show excess relative risks depending on levels of bone marrow absorbed doses and the black line shows excess relative risks based on a linear quadratic model.

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