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Radiation Caused

Calculation of Potential Health Effect for person living in the Northern Marshall Islands.

410072

Potential Health effects for person living in the northern Marshall Islands are calculated using the same assumption and same methods used for ~~calculat~~ the Rikini population (copy attached). Risk coefficient from both BEIR I & BEIR III were used providing not only a range of estimate but also a comparison of the most conservative (linear, relative risk model) with what would be described by many radiation biologists as the most probable (linear-quadratic, absolute model)

Population estimates

The various population estimates are derived by scaling from the Bikini calculation (copy attached) for a population of 550. That calculation predicted 1277 births, 164 deaths over a period of 30 years, and a final population of 1684 after 30 years, for an initial population of 550.

Deaths in 30 years: $\frac{164}{550} = \frac{\text{deaths in population of interest}}{\text{initial population of interest}}$

Births in 30 years: $\frac{1277}{550} = \frac{\text{births in population of interest}}{\text{initial population of interest}}$

Population after 30 years: $\frac{1684}{550} = \frac{\text{population after 30 years}}{\text{initial population of interest}}$

Also from the Bikini population, the estimate of the full 30 year dose received by children born during the 30 year period is 0.36.

Risk Coefficients

Both BEIR I + BEIR III risk coefficients are used.

They are as follows:

BEIR I

Cancer — Mortality: Absolute risk of leukemia (26×10^{-6} rem^{-1}) + 30 year elevated risk for other cancers (61×10^{-6} rem^{-1}) = 87×10^{-6} rem^{-1}.

Morbidity: Relative risk of leukemia (37×10^{-6} rem^{-1}) + lifetime elevated risk (921×10^{-6} rem^{-1}) = 458×10^{-6} rem^{-1}

first generation,

Manganese : 75×10^{-6} increase per cent
first generation,

Naen
Likiep
Mejit
Utirik
Am
Utirik
Ujelang
Ailuk
Kepen
Bigen
Berejao
Ailuk
Wotho
Medjeron
Kabben
Taka
Jemo
Bikar
Omgorik

Ailinginae
Kox

REPOSITORY PNNL

COLLECTION Marshall Islands

BOX No. 56 88

FOLDER Calculations 9/82

DOCUMENT **DOES NOT** CONTAIN ECI

Reviewed by DJ Krahn Date 4/30/97