409890

RISK ESTIMATES FOR ENEWETAK AND BIKINI

Calculations made at Enewetak on
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Preferred Approach

Total risk = B.M. Dose x Leukemia risk coefficient + W.B. dose x (total risk - B.M. risk)

Pop. for risk assess.

500 for living on Southern Islands
250 for Enjebi
} assumed

[If Enjebi is occupied - only dri Enjebi would live there (∿250)
if Enjebi is not occupaied - all 500 would live on Southern Islands)

(during visit - 541 Enewetak people)

50-year dose should be used - 30 years is too short

Risk Coefficients - 5 sets of analysis should be done using:

a. BEIR I - % increase as before
b. BEIR - risk/man rem
c. BEIRIIII - lowest coefficient - absolute - lin. quad.
d. UNSCEAR - highest coefficient - relative - linear

Because of the proportion of children I believe the cancer risk should be calculated on an age basis. The leukemia risk coefficient is equal to total cancer risk coefficient when irradiation is in utero and decreases to about one-fifth of total cancer risk coefficient after ∿ age 30.

Based on BEIR I

Cancer - 2% per 5 rem over 30 years

2%/5 = 0.4%/rem

Based on ICRP

Risk coefficient for total body = $100/10^6$/person rem

for 11 rem 500 people x 11 = 5500 person/rem

$$\frac{1}{10^4} = \frac{x}{5500} = 10^4 x = 5500$$

$$x = \frac{5500}{10000} = \frac{55}{100} = .55$$

risk coefficient - bone marrow $20/10^6$ person rem

Enjebi

	30-year dose	50-year dose	
BM	5,500 mrem		imports
WB	5,100 mrem		imports
BM	10,000 mrem		no imports
WB	9,200 mrem		no imports

Max. Annual Dose
multiply by 3 for maximum indvidual

Eneu (100% living on Eneu)

B.M.	118 mrem/year	imports
W.B.	107 " "	
B.M.	238 " "	no imports
W.B.	205 " "	

Bikini (100% living on Eneu)

B.M.	1007 mrem/year	imports
W.B.	952 " "	
B.M.	1941 " "	no imports
W.B.	1766 " "	

(risk - 0.4%/rem)

Eneu (100% living on Eneu)

	30 years	
B.M.	2800 mrem	imports
W.B.	2400 mrem	
B.M.	5800	no imports
W.B.	4600	

Bikini (100% living on Eneu)

B.M.	23,000 mrem	imports
W.B.	21,000	
B.M.	46,000	no imports
W.B.	40,000	

	Assumed Population Bases
Bikini	∿ 400
Eneu	∿ 200
No return	∿ 300
Enjebi	∿ 250
Southern Islands	∿ 500

Use same age distribution for all groups

CANCER/RISK

	With Food Import			Without Food Import		
	% Increase	No/100	Total	% Increase	No/100	Total
Bikini (400)	9.2	.92	3.68	18.4	1.84	7.4
Enjebi (250)	2.2	.22	0.55	4.4	.44	1.1
Eneu (200)	1.1	.11	.22	2.3	.23	.46

10% deaths due to cancer (normal)

BIRTH DEFECTS

	With Food Import					Without Food Import				
	W.B. Dose	% Increase	Increase No/100	Normal No.	Total Addit-ional	W.B. Dose	% Increase	Increase No.100	Normal No.	Total Addit-ional
Bikini (400)	21.	4.2	.084	8	.326	40.	8.0	.160	8	.640
Enjebi (250)	5.1	1.0	.020	5	.05	10.	2.0	.040	5	.1
Eneu (200)	2.4	.48	.0096	4	.0192	4.6	.92	.0184	4	.0368

2%/rem