

Brief Summary of Medical Findings in the Marshallese  
Accidentally Exposed to Radioactive Fallout in 1954

The accidental exposure occurred on March 1, 1954 following detonation of a thermonuclear device on Bikini in the Pacific Proving Grounds. A shift in wind resulted in fallout on the following inhabited islands:

<u>Island</u>	<u>Distance from Bikini</u>	<u>No. of People</u>	<u>Estimated Gamma dose</u>
Rongelap	105 miles	64	175 rads
Ailingnae	110 "	18	69 "
Rongerik	135 "	28*	70 "
Utirik	275 "	158	14 "

\* American Service men

There were no deaths but certain acute effects were noted, particularly in the Rongelap people. Transient depression of blood cells was followed by recovery to near normal levels by one year. Fallout deposited on the body resulted in skin burns and spotty loss of hair in the Rongelap, Ailingnae and Rongerik groups. The burns healed and the hair regrew without complications in several months. Urine analyses revealed that internal absorption of radioactive material had occurred from inhalation and ingestion of contaminated food and water but no acute effects were observed from this source (as will be seen below late effects did occur).

Follow-up examinations during the first decade showed few findings that could be related to radiation exposure. Possibly related was the occurrence of about twice the number of miscarriages and stillbirths in the exposed compared with unexposed Rongelap women. This difference was not seen after 5 years.

During the second decade there have been more serious developments. Some Rongelap children showed growth retardation which was later realized to be associated with a hypothyroid condition due to radiation injury to the thyroid gland largely from radioactive iodine absorbed at the time of the fallout. The thyroid dose was estimated to be 335 rads for Rongelap adults and 700-1400 rads for children, the higher dose in children being due to the smaller size of their thyroid glands.

In 1963 tumors of the thyroid began to appear in Rongelap children and to a lesser extent in adults. These tumors have continued to develop in ensuing years until at the present time 29 of 86 Rongelap and Ailingnae people (about 1/3) have developed abnormalities of the thyroid gland, the majority in children.

<u>Group</u>	<u>Age at Exposure</u>	<u>No.</u>	<u>Thyroid Abnormalities</u>	<u>Surgery</u>	<u>Cancer</u>
Rongelap	< 10	22*	18 (82%)	16	1
	> 10	45	5 (11%)	4	2
Ailingnae	< 10	7**	2 (29%)	1	0
	> 10	12	4 (36%)	3	0
Combined	< 10	29	20 (70%)	17	1
	< 10	86	29 (34%)	7	2

\* 3 of these were exposed in utero, one of whom had non-malignant thyroid tumors removed.

\*\* 1 of these was exposed in utero.

The table shows that 24 have had thyroid surgery in the United States with three of the tumors proving to be cancer. No recurrence of tumors has been noted following surgery. A low incidence of thyroid tumors has also been noted in the unexposed Rongelap control and in the low exposure Utirik groups.

The exposed Rongelap people have been treated with thyroid hormone for the past 10 years and this treatment has successfully maintained normal thyroid status in the affected people and enhanced growth and development in retarded children.

In 1972 a 19 year old Rongelap man who had been exposed at one year of age died of acute leukemia in spite of ~~the~~ extensive treatment at the Clinical Center of the National <sup>Institute of Health</sup> ~~Cancer Institute~~. The illness may have been induced by radiation.

The annual medical examinations of the exposed Marshallese people continue with a team of highly qualified medical specialists. In addition we now have a resident physician stationed in the Marshall Islands who makes at least quarterly visits for health care to the exposed people on the outer islands.