DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30341-3724

June 25, 1998

Mr. R. Thomas Bell
Supervisory Health Physicist
International Health Studies Office
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874

Dear Mr. Bell:

Enclosed is a summary update of Centers for Disease Control and Prevention's work in the development of a nationwide epidemiologic thyroid disease study in the Republic of the Marshall Islands.

We would be happy to answer any questions you may have at the Department of Energy-Republic of the Marshall Islands Bilateral Meeting, July 1-2, 1998.

Sincerely,

Paul G. Renard
Project Officer
Marshall Islands Cooperative Agreement
U50/CCU910802-02

Enclosure

cc:
Ambassador Plaisted, US Embassy, RMI
Mr. Donald Ahern, US Embassy, RMI
Mr. Donald Capelle, RMI
Dr. Paul Seligman, DOE
Ms. Suzanne Butcher, DOS
Colonel Ashton Ormes, DOS
Ms. Lynn Sicade, DOS
Mr. Alan Stayman, DOI
Mr. Joseph McDermott, DOI

Ms. Linda Vogel, PHS
Dr. Henry Falk, CDC
Mr. Mike Donnelly, CDC
Dr. Paul Garbe, CDC
Dr. Charles Miller, CDC
Dr. Owen Devine, CDC

Marshall Islands Thyroid Study

Update for DOE-RMI Bilateral Meeting, July 1-2, 1998

Proposed Study: The Centers for Disease Control and Prevention (CDC), in collaboration with the Ministry of Health and Environment (MOHE), Republic of the Marshall Islands, proposes to conduct a Nationwide Thyroid Disease Study for the Marshall Islands. The purpose of the study will be to:

1. determine the occurrence of thyroid nodules and neoplasms in current RMI residents who lived in the RMI and were younger than 15 years of age at any time during the years of US atomic weapons testing, 1946-1958;
2. estimate for these persons thyroid radiation doses which could have resulted from exposures to weapons test fallout; and
3. determine if there is an epidemiologic association between the occurrence of thyroid nodules and neoplasms and radiation exposures.

The proposed study would be coordinated with public health programs sponsored by the Ministry of Health and Environment which provide general preventive medical services to current Marshall Islands residents.

Feasibility assessment: CDC has followed Institute of Medicine guidelines for assessing the feasibility of epidemiologic studies in radiation exposed populations (IOM, 1995). Based on these guidelines we conclude that it is feasible to carry out a nationwide thyroid study in the Marshall Islands.

1. Population. Since children are more susceptible to thyroid radiation damage than are adults (NAS, 1990), the most appropriate population group to assess would be those residents of the RMI who were 15 years of age or younger anytime during the years 1946 and 1958. From data available in the most recent Marshall Islands census (1988), there are about 8,000 persons currently living in the RMI who meet this criterion. The proposed study will attempt to examine all eligible persons currently living in the Marshall Islands. Field tests conducted in 1996 in Majuro and Wotje indicate participation rates in a nationwide study are likely to be very high.

2. Radiation dose estimation. CDC has actively sought, identified , and in many instances reviewed relevant historical documents for the Pacific weapons testing program. These documents indicate that radioactive fallout was measured during testing in the Marshall Islands using monitoring ground stations equipped with gummed film, aerial ground surveys, and other methods. These measurements detected fallout clouds for several days post detonation for various RMI atolls, and for sites as far away as Guam. Our assessment is that dose reconstruction will be possible for all atolls within the Republic of the Marshall Islands.

2. Statistical power and study size. We estimate that a sample size of 1,100 participants for a study of thyroid nodules and 5,800 for a study of thyroid cancer will be required to achieve a median statistical power of 80%. These calculations assume a background prevalence for thyroid nodules of 2.45% and for thyroid cancer of 0.45%. Based on our evaluation of the RMI census data and field tests of participation rates in Majuro and Wotje, we expect to be able to recruit enough participants.

3. Thyroid examinations. All study participants will receive a clinical examination of their thyroid gland using both palpation and ultrasound imaging. Persons with palpable nodules greater than 1 cm will receive a fine needle aspiration biopsy to determine whether the nodule is neoplastic, and to describe its histologic and cytologic characteristics. In addition, thyroid function tests and thyroid autoimmune antibody tests will be performed to aid in the diagnosis and follow-up treatment of thyroid disease. All eligible persons will be offered the opportunity to participate in this study, but no person will be denied thyroid screening. Guidelines for follow-up of persons identified to have thyroid cancer will be drafted in collaboration with expert physicians, the RMI Ministry of Health and the Environment, and the 177 Health Plan.

The lack of adequate facilities with running water and electricity in rural atolls, where one third of the eligible study population resides, pose major logistical challenges to the successful completion of thyroid examinations for this study. In order to overcome these logistic problems, we propose partnerships with organizations that have the capability of providing clinical and preventive medical services under those circumstances. This could allow provision of a broader public health program to the population for modest additional expense.

Project status. CDC continues extensive search and evaluation for historical records, and has outlined methods to be used for dose estimation. A detailed scientific protocol for the nationwide thyroid study is in preparation. This document will be completed in September, 1998 and will be sent for review at that time to the National Academy of Sciences (NAS). Revisions will be made based on the NAS suggestions, and then a final protocol will be submitted to Institutional Review Boards at the MOHE and CDC.

References

IOM, 1995. Adverse reproductive outcomes in families of atomic veterans: The feasibility of epidemiologic studies. Institute of Medicine. National Academy Press, 1995.

NAS, 1990. Health Effects of Exposure to Low Levels of Ionizing Radiation, BEIR V Report, National Academy of Sciences. National Academy Press. 1990.

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