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Radiation Effects Research Foundation Links Past and Future

The Radiation Effects Research Foundation (RERF) is one of the major HSS programs. HSS provides funding and management oversight to the RERF in Hiroshima and Nagasaki, Japan, in partnership with the Japanese Ministry of Health, Labour and Welfare. The RERF program is believed to have the longest duration of any international research program.

The history of the DOE and the history of RERF are intertwined. At the end of World War II, the Atomic Energy Act was signed in 1946 and the civilian Atomic Energy Commission (AEC) was formed. One mission of the AEC was to promote nuclear applications for scientific, medical, and industrial purposes. In August 1947, the first contract between the AEC and the National Academy of Sciences (NAS) was signed to establish the laboratories of the Atomic Bomb Casualty Commission (ABCC), which later became RERF. This was the foundation for the longterm study of the survivors and the long history of support for ABCC/RERF by DOE and its predecessor agencies.

Hiroshima after bombing. The large building in the background, now called the A-bomb dome, remains standing within the Peace Memorial Park. This area is near the hypocenter of the bomb blast. Irradiated material, such as granite and copper samples, have been collected at various distances from the hypocenter and used in the estimation of radiation doses from the bomb.

The Energy Research and Development Administration was instrumental in establishing RERF under Japanese law as the full successor to ABCC to continue the research under a binational system, shortly before DOE was established in 1977. Today, DOE is the major U.S. funder of both basic research and epidemiological studies involving environmentally-relevant doses of radiation, and HSS has the leadership role in supporting studies of exposed populations.

The RERF Hiroshima Laboratory (quonset hut shape) sits atop Hijiyama in a public park located in the southern ward of Hiroshima, a modern city with a population of more than 1 million. Ground zero would be to the left of the river and approximately 1800 meters from RERF.

The RERF Act of Endowment states its objective "to conduct research and studies, for peaceful purposes, on medical effects of radiation on man and on diseases which may be affected by radiation, with a view to contributing to the maintenance of the health and welfare of atomic bomb survivors and to the enhancement of the health of all mankind." The results of RERF research are the primary basis for radiation protection standards throughout the world. Radiation risk estimates rely on an accurate dosimetry system, which has been established through funding to international scientists through DOE and the Japanese Ministry of Health, Labour and Welfare.

The core projects of RERF are the Life Span Study, the Adult Health Study, the F_1 (Children of the A-bomb Survivors) Study, and the In Utero Study. The Life Span Study consists of a large

cohort (120,000 persons) encompassing a wide range of known doses. Risks are evaluated for cancer incidence, cancer mortality, and non-cancer effects in relation to radiation dose. About 40 percent of the study population are still living, and about 90 percent of the survivors exposed under the age of ten are still living. Clinical examinations of atomic-bomb survivors are conducted every two years in a smaller population in the Adult Health Study and provide a continuing health profile of an aging population. In addition, blood samples are collected under informed consent for future analysis. The F_1 Study determines whether genetic effects might be apparent that could be related to parental exposures. Thus far, no genetic effects have been observed. The In Utero Study is a unique evaluation of the lifetime health experience of those who were in utero at the time of the bombings (about 3,600 persons).

The funding agencies recognize that continuation of the atomic bomb survivor studies is essential so that we can come to definitive answers on the health effects of radiation. However, the RERF program is not a typical research program since it aims at fostering the health and welfare of these survivors. Similar to other HSS programs, a major concern is the individuals who have been adversely affected by the legacy of nuclear weapons production and use. The cooperation of the atomic-bomb survivors has been the backbone of the RERF research program, and we owe a debt of gratitude to the survivors, past and present. Further information about RERF can be obtained at http://www.rerf.or.jp.