This year marks the 60th anniversary of the atomic bombings of Hiroshima and Nagasaki that ended World War II. Whatever the historical circumstances at the time, the bombings were tragic experiences for the cities and for the many who sustained severe blast, heat, and radiation injuries. The horrifying consequences prompted efforts to control nuclear arms proliferation, an issue that still remains a top foreign policy priority. The cities have made remarkable recoveries, and the survivors maintain indomitable spirits, allowing themselves to serve as a reference point for modern radiation safety in the world. As the size of this population of survivors grows smaller, we must not lose a sense of responsibility to support them and to investigate and understand the health consequences engendered by these events.

This week, the World Health Organization and Nagasaki University hold a joint meeting to review the latest information on radiation-induced effects in the atomic bomb survivors and to consider the implications of this research for international policies. Since the bombings, follow-up investigation of the health of the survivors has continued. Early in 1947, the U.S. government founded the Atomic Bomb Casualty Commission, managed by the U.S. National Academies with cooperation from the Japan National Institute of Health. In 1975, the United States and Japan became equal funding partners, creating the Radiation Effects Research Foundation to continue the study.

The main epidemiological investigation of atomic-bomb survivors is the Life Span Study. It is based on a large cohort from a general population of both sexes and all ages, encompassing a wide range of accurately known doses and incorporating accurate recordings of disease incidence and mortality. The original cohort had 120,000 survivors. This included large representative groups of young people, who are the people currently being monitored. At present, about 43% of the Life Span Study cohort is still alive.

A major finding is that radiation-associated cancers continue to occur as a small enhancement of the background rates. Through the year 2000, 8% of the deaths from solid cancers in individuals exposed to radiation could be attributed to radiation. Many of these radiation-related cancer deaths were recorded in recent years of monitoring, indicating that as the survivors age and enter the cancer-prevalent period in their lives, significant additional radiation-related deaths can be expected. Radiation-associated deaths from leukemia (46% of all leukemia deaths) peaked within 10 years of the bombings and no longer occur. Noncancer deaths are also showing a small but significant relationship, with radiation exposure making up 1.4% of these deaths. That finding requires explanation of the underlying mechanisms. Genetic effects are being investigated, although health effects in children of the survivors have not been apparent. About 94% of the second generation is still alive.

It is essential to continue the lifetime study for its full duration, for which continued cooperation from the survivors and support from the U.S. and Japanese government sponsors will be necessary. Its investigations of health consequences are heavily relied on to establish guidelines for human health and safety policies throughout the world. The survivor data feature prominently in international scientific reviews of radiation effects, such as those of the United Nations. The International Commission on Radiological Protection uses the risk evaluations to derive recommendations for radiation protection that are adopted by most countries. Reports on the Biological Effects of Ionizing Radiation from the U.S. National Academies also rely heavily on survivor data and have not only figured into formulating safety guidelines but are relevant to many current issues of concern such as worker and public protection, worker and survivor compensation, cleanup efforts, accident response, and counterterrorism preparedness.

A further 5-year funding agreement between Japan and the United States will be put in place this year, ending concerns regarding continued funding of this unique project. But a very important phase of examining the younger exposed cohorts and children of the survivors is just beginning, with a dominant time frame being the 2000–2040 period. We have a responsibility to continue this study, to contribute to the welfare of those affected, to understand and quantify the effects, and to provide a scientific basis for radiation protection and medical policies worldwide. We should not lose the memory of these events or lessen our resolve to understand their effects even after 60 years.

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Editor's Summary

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