

Vocabulary Review Passage 2

(1) In 1947, two years after the bombs were dropped, the Atomic Bomb Casualty Commission (ABCC) was established by the U.S. National Academy of Sciences to study their health effects on the survivors. In 1975, funding was partially shifted to the government of Japan and the ABCC was given a new name, the Radiation Effects Research Foundation. (It was agreed by both Japanese and Americans that the words “atomic bomb” should be removed from the name.)

(2) The actual studies did not begin until 1950, five years after the bombs were **dropped**, when Japan took a national census. Citizens were asked where they had been on the fateful days of August 6, 1945, and August 9, 1945, and a survivor population of 195,000 was identified. Over the next ten years, about half of the survivors were interviewed and asked where they were standing in relation to the **blasts** and whether they’d experienced symptoms associated with radiation exposure—whether they’d suffered bleeding, coughing up blood, blood in the stool, purpura spots (vivid, purple spots in the skin that are evidence of bleeding), patches of spontaneous bruising, acute **lesions** of lips and tongue, hair loss. On the basis of the symptoms they described and their distance from the explosions, the *dose* they’d received was estimated. Dose estimates ranged from low to over four hundred rads, with every possible **gradation** in between, though estimates were approximate, taken on trust and memory, and dose reconstruction was crude. The radiation the bombs gave off was calculated on the basis of tests conducted in the Nevada desert. The blasts had created a kind of human **laboratory** for studying the effects of radiation. The survivors became the largest population of humans exposed to radiation for whom estimates of doses are available. One Japanese radiation expert noted that he had been able to experiment only on rabbits, while the Americans had conducted a human experiment.

dose:
amount
taken in

(3) No medical study ever has had such resources lavished on it and so many scientists involved. It had—and still has—staffs of hundreds, scientists from all over the world; it has **state-of-the-art** equipment, computers, and data-gathering and analyzing facilities. Since the enterprise is so large and **lavishly** funded, and since in epidemiology, the larger the sample, the

greater the statistical accuracy—or so it is believed—there has been a tendency to accept these studies without question. The ABCC/RERF has produced “pages and pages, volumes and volumes of official reports, unofficial reports and what have you,” as Alice says.

(4) There are many powerful committees concerned with radiation protection, and they all **accept** the calculations of the Radiation Effects Research Foundation (RERF). The International Commission on Radiation Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Atomic Energy Agency (IAEA) all agree that RERF estimates are applicable to all situations involving radiation risks, including nuclear work and medical x-rays. In addition to the international committees are the national committees—the National Radiation Protection Board (NRPB) in England and the Biological Effects of Ionizing Radiation Committee, a special committee of the National Academy of Sciences (NAS), in the United States. The national committees are free to **modify** the recommendations of the international committees, but in practice they do not—they take the word of the International Commission on Radiation Protection and the ICRP takes the word of the Radiation Effects Research Foundation. The ICRP’s 1990 report, ICRP 60, is based on RERF data.

(5) The U.S. committee on Biological Effects of Ionizing Radiation (BEIR) is the most prestigious of the national committees. It has produced several reports, numbered in sequence, BEIR I, BEIR II, and so on. The 1990 report, BEIR V, is commonly regarded as the gold standard for radiogenic risk estimates and the most comprehensive overview of the health effects of radiation. It too is based on RERF data.

(6) The RERF assumes a **linearity** of dose-response relationships: you can move down a line from high to low dose and can figure out, according to a principle of linear extrapolation, radiation risk at low dose. BEIR V and ICRP 60 proclaim that if the dose is small and is **accumulated** over time (as it is in the case of nuclear workers), cancer risk will be less than that predicted by linear extrapolation. It has been assumed that if the dose is low enough, risk will disappear entirely; this implies there is a safe level of radiation, a **threshold** beneath which radiation presents no danger (though this position is being modified, as we’ll see).

(7) When the ABCC began its study in 1950, it concluded that the population had returned to normal; the RERF concurred. According to their calculations, the death rate from all causes except cancer had returned to normal.

Adapted from Gayle Greene, *The Woman Who Knew Too Much: Alice Stewart and the Secrets of Radiation* (Ann Arbor: University of Michigan Press, 2001), 131–32.