The Public Health Impact of Hanford

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The Hanford Nuclear Reservation, located in eastern Washington State just a few hours east of Portland along the Columbia River, is the largest and most expensive environmental cleanup project in the Western Hemisphere and one of the most dangerously polluted places on Earth. Established in 1943 as part of the Manhattan Project, Hanford was designed to produce plutonium for nuclear weapons, and the facility began almost immediately to contaminate the soil, air and water of the surrounding region through repeated releases of highly toxic chemical and radioactive materials. In addition to the detrimental impacts on the natural environment throughout Hanford's roughly 600 square miles of harsh, arid landscape, pollution from the site has had severe and lasting effects on the health of residents working at and living in close proximity to it, the latter group often referred to as Hanford downwinders.

For more than four decades following Hanford's construction, the United States' government refused to even admit that the facility was responsible for any radioactive or chemical releases into the surrounding area, much less to acknowledge any associated health impacts on the neighboring human population. It was not until 1986, in response to mounting public pressure and the efforts of the citizen group Hanford Education Action League (HEAL), that the U.S. Department of Energy released more than 19,000 pages of previously classified documents revealing that huge releases of radioactive materials from Hanford had contaminated much of the surrounding area and entered the Columbia River. Intentional and accidental aerial releases, as well as the discharge of irradiated river water used for cooling Hanford's nuclear reactors into the ground or directly back into the Columbia, led to elevated doses of radiation and increased exposure to the numerous toxic chemicals used in the nuclear fission process for many thousands of residents living downwind and downstream of the site.

Radiation's Effect on the Human Body

According to a 2005 report from the National Academies of Science concerning the effects of radiation on human health, there is no safe level of exposure to radiation. The report, "Health Risks from Exposure to Low Levels of Ionizing Radiation," confirmed the Academies' understanding that even very low doses (less than 100 millisieverts) of radiation can cause cancer, that risks associated with any exposure to ionizing radiation are higher than had been historically assumed, and that additional exposures to radiation, including external and internal exposures through inhalation or ingestion of radioactive particles, increase the risks to human health.

The report refers to ionizing radiation, the type of high-energy radiation capable of breaking atomic structure apart and causing serious damage to living cells, cellular death and genetic mutation. Radiation released by the primary product of Hanford, plutonium-239, falls into this category. High doses of ionizing radiation are lethal, a fact known since the earliest days of radiation science, with acute effects including nausea, vomiting, burns and hemorrhaging, among others. Inhalation of even the most minute amount of high intensity radioactive material such as plutonium-239 can cause cancer, and studies of workers at Department of Energy (DOE) nuclear weapons facilities, including Hanford, show evidence of excess rates for all types of cancer.

Given that even limited exposure to ionizing radiation can cause extensive damage to living tissue, and that at least one-third of Hanford's high-level nuclear waste containers have in the past or continue to this day to leak and substantially contaminate the land, air, water and food chain around the facility, responsible medicine dictates drawing a connection between Hanford's activities and the numerous detrimental health impacts reported in nearby populations. This is especially true when one considers the extreme difficulty of containing Hanford's radioactive and chemical toxicity to a limited geographic area, the slow and repeatedly delayed process of cleanup at the site, and the fact that Hanford's plutonium-239 contamination, due to the isotope's long half-life, will remain a significant danger to human health for hundreds of thousands of years.

Oregon PSR and Hanford Downwinders

Oregon PSR became involved with the downwinders nearly two decades ago when a group of Hanford-area residents sought and received support from scientists and physicians who were then volunteering with our organization, leading to the formation in 1993 of the Northwest Radiation Health Alliance (NWRHA), a group of concerned health professionals, scientists, environmental and public health activists and affected community members. Having for decades met with rejection of accountability and official denials from regulatory and state and federal public health agencies of the association between environmental contamination at Hanford and their chronic and serious health complaints, and unable to get reliable information or appropriate medical services from most local physicians, a number of downwinders organized into grassroots coalitions to better educate and advocate for themselves and their community.

Seeking answers to the downwinders' questions and concerns about Hanford's perceived negative impact on their health, the NWRHA designed, distributed, collected and analyzed a community-based health survey of 801 individuals who had lived downwind of Hanford (roughly described as the intermountain area between the Cascade Range of western Oregon and Washington and the Rocky Mountains of western Idaho) during the time period between 1944 and 1995. The results of the survey, which contrast sharply with radiation health research conducted by the DOE and various other government regulatory and public health agencies, are telling.

Hanford's Effects on Human Health

In comparison to a selected control group of one of the NWRHA doctor's patients living in Portland, and thus outside of Hanford's immediate range of contamination, the health survey of Hanford downwinders revealed a significant preponderance of all types of cancers, including thyroid cancer, central nervous system neoplasms, breast, colon, and female reproductive cancers, thyrotoxicosis including hyperthyroidism, Graves' disease and toxic goiter, as well as greater than expected incidences of hypothyroidism. Additionally, many downwinders suspected radiation associations with increased incidence of certain types of allergies, autoimmune disorders, chronic fatigue syndrome, and heart disease, as well as unusually high numbers of cases of spontaneous abortions, infant mortality and birth defects. These health issues, often dismissed as anecdotal by government regulatory and public health agencies, were reported in such high

numbers in the NWRHA's health survey as to raise reasonable suspicion regarding Hanford's long-obfuscated public health impact.

In a series of peer reviewed journal articles published by Oregon PSR members and supporters including Dr. Charles Grossman, Dr. Rudi Nussbaum, Dr. William Morton, Fred Nussbaum and Patricia Hoover, among others, a connection between the release of radioactive materials from Hanford and elevated levels of radiation-related health effects among area residents is clearly established. Drawing largely from the community-based health survey results analyzed by the NWRHA volunteers, and making comparisons where appropriate to health impact statistics related to the 1986 explosion at Chernobyl, these articles suggest evident associations between the health problems reported by Hanford downwinders and reports in existing medical literature on the effects of x-rays, radioiodine treatment, and atmospheric radiation releases on human health.

In addition to the effects of radiation from inadequately warehoused radioactive materials, strong evidence suggests that the many highly toxic chemicals used at Hanford also negatively impact the health of downwinders. Many of these toxicants are persistent and bioaccumulative. Heavy metals such as chromium, mercury, lead, arsenic and cadmium adversely affect cellular and nervous system functioning, asbestos and silica can cause serious, often fatal respiratory diseases when inhaled, and numerous organic chemical compounds used in nuclear weapons production affect the nervous system, liver, skin and kidneys, and may also cause a variety of cancers, especially when exposure to radioactive pollution or to other toxic chemicals from industrial agriculture is concurrent, as is the case at Hanford.

The Continuing Challenge of Hanford

Even the most conservative estimates indicate that Hanford cleanup will take at least another 50 years to complete, and there is little legitimate doubt that it will continue to pollute the surrounding region for generations to come. Hanford downwinders continue to face daunting challenges in having their medical issues acknowledged by regulatory and public health agencies, and usually insurmountable problems in seeking their due recompense.

It wasn't until February of 2000 that the DOE finally acknowledged that Hanford could be responsible for death and illnesses among their workers, leading to the passage of the Energy Employees Occupational Illness Compensation Act, for which only a very small fraction of Hanford employees have yet been approved. The legislation does nothing to address the health challenges faced by area residents who were not Hanford employees, and there continues to be official denial of responsibility and deliberate deception and downplaying of Hanford's impact on the health of downwinders from the DOE and other agencies.

For nearly 70 years, Hanford has adversely affected the health of communities throughout its surrounding region, and the suffering and premature death of downwinders is very much a present-day reality, all official denials of responsibility notwithstanding. Oregon PSR will continue to advocate for Hanford downwinders and for swift and responsible cleanup efforts, and to stand against the military and corporate ideologies that allowed this once-pristine area of our country to be turned into a toxic nightmare for the next few hundred millennia.