



Testimony to NAS Committee on Radiation Exposure Screening and Education Program

Testimony before the Committee on the Assessment of Scientific Information for the Radiation Exposure Screening and Education Program, National Academy of Sciences at a hearing in Boise, Idaho

November 6, 2004

by Arjun Makhijani, Ph.D.

President, Institute for Energy and Environmental Research (IEER) on behalf of IEER and the Snake River Alliance

I am honored to represent the Snake River Alliance, my favorite grassroots organization, and the Institute for Energy and Environmental Research (IEER) before you today. My colleague Lisa Ledwidge and I sent you [a letter regarding your study](#) of the Radiation Exposure Compensation Act on September 2, 2004 and I am submitting it again here to you for the record here in Idaho. Please consider this testimony an update of that letter, especially since I have learned some new facts and have had the occasion to do a few calculations since that time regarding the subject of your study.

My main recommendation to you today is that you take a comprehensive look at the affected populations so that this issue does not have to be revisited every few years, with more people testifying about family members who have already passed away, with their children and parents, and spouses, and siblings in grief and financial and medical distress. Both the geographic coverage as well as the coverage of the diseases should be expanded. with the benefit of the doubt being given to those who suffered radiation doses without their informed consent.

If one applies the same compensation criteria as those applied to nuclear weapons workers in the Energy Employees Compensation legislation of the year 2000, to thyroid cancer, the compensation program would extend to a significant fraction of the U.S. population born after about 1940 to 1962, and possibly thereafter. Since many, though not all, nuclear weapons workers had at least a partial awareness that they were being exposed to radiation, the criteria for defining the portion of general population that is covered should be more expansive and generous. Likewise the compensation amount and health care benefits should not be less generous than that given to workers under the [2000 energy-employees law](#).

In the spring of 1998, a few months after the NCI thyroid cancer study was released, I was the first scientist to tour some of the most affected areas in Idaho as part of a tour organized by the Snake River Alliance, to speak about fallout. I heard the same kinds of stories you are hearing today. I was stunned as a human being and as a parent, to hear what people had endured and were enduring still.

I am glad you are here as part of an official study, finally. I have felt since 1997 that the government should have sent its own scientific representatives to explain to the people in their home towns like Challis and Twin Falls what had occurred there. One of the reasons I came in 1998 is that the federal government did not do so. I urge you to hold hearings in other parts of the country, including Montana, Iowa, Kansas, Missouri, New York, Vermont, and other states that were affected significantly by fallout.



I was glad to hear Dr. Douple acknowledge today what is clear from the CDC maps — that hot spots occurred far and wide all across the United States. I believe that parts of Canada were also significantly affected.

For instance, the CDC calculator estimates the thyroid dose to a female born in Gem County, Idaho on January 1, 1952 as 55 [rad](#). The dose to a female born in Grand Isle County, Vermont on the same day would be 21 [rad](#). In both cases, I assumed average milk consumption. If either person got thyroid cancer, the likelihood that it was caused by fallout is 95 percent and 83 percent respectively using average risk coefficients. As you know, the worker radiation compensation act requires a 99 percentile risk calculation, which is far more generous and favorable to the exposed person.

I understand that the CDC has a calculator that allows a 99 percentile risk calculation, but that it is not accessible to the general public. I urge you as well as Idaho's congressional delegation to ensure that this part of the web site is accessible to the public. As you have seen, many people, including those without scientific degrees, can and do become very adept on technical issues. Mothers are among this country's best epidemiological researchers. I think the public should be able to compare at what risk levels workers would be compensated and what is the situation under RECA at present or as may be proposed in future legislation.

You also heard testimony today about other radionuclides and other test sites. This issue came up in 1997, when the NCI study on iodine-131 was published. Congress asked for preliminary evaluation of this issue to be done. A [draft study](#) was completed in 2001 but a final version has still not been published, though I understand that it has been ready for some time. It sits in the office of the Secretary of Health and Human Services awaiting permission for publication.

The draft study indicated that many areas not seriously affected by Nevada testing were affected by fallout from U.S. and British testing in the Pacific and by Soviet testing in what is now Kazakhstan. This study, as well as the other test sites in this country should also be taken into account in your study.

I called your attention to the first ever nuclear test in 1945 in my Sept. 2, 2004 letter and I do so again. This test produced severe fallout and it is a shame that no attention has been paid to those who suffered radiation doses from it. I request to look into this, and when you do to look into the question of whether infant mortality increased in the aftermath of that test. There were well documented hot spots; there was a vast swath of fallout from this test.

IEER first tried to call attention to the problem of hot spots and health effects in a 1991 book which IEER did jointly with the International Physicians for the Prevention of Nuclear War. I am providing you with a copy of this book, [Radioactive Heaven and Earth](#) for the Record. More information about it and fallout is available on the IEER website, www.ieer.org. Among other things, we showed that a variety of radionuclides would be expected to cause hundreds of thousands of cancers across the world. The people in the hot spots, such as those in Idaho, were the most affected.

In Chapter 4 of *Radioactive Heaven and Earth*, you will find clear documentary evidence that the U.S. continental test site was located in Nevada with the clear knowledge that it would blow fallout over most of the continental United States, due to prevailing westerly winds. This makes it imperative that your recommendations of the affected population be comprehensive and generous.



Today, I heard for the first time testimony that provides scientific evidence that those in hot spot areas were not only subject to what is officially called low-level radiation, but also high-level radiation that creates somatic, detectable effects, like hair loss. In the evidence given to you today, the hair loss was associated with a fallout event that was documented by Geiger counter measurements taken before and after the fallout. I have heard much anecdotal evidence to this effect before, but this is the first time that I have heard hair loss linked to actual measurements that detected the fallout in the hot spot.

No official study, to my knowledge, has acknowledged high-level radiation doses so far. I recommend that you do so and that you stress the testimony that was given to you this morning as part of the evidence. This is important because it means that the number of cancers and diseases that must be covered at least in the hot spots would be wider than the 20 cancers recognized in RECA. I note here that the worker compensation legislation passed in the year 2000 covers all cancers except chronic lymphocytic leukemia for those workers whose doses can be estimated. Since individual doses cannot realistically be estimated for downwinders with reasonable confidence (as distinct from area or population doses, as was done in the NCI study), the list of cancers in RECA should be no shorter.

Recent data from Hiroshima and Nagasaki indicate that diseases other than cancer are caused by radiation exposure. Dr. Lynn Anspaugh of the University of Utah has already testified to you about this from a scientific point of view. Today you have heard testimony from many affected families regarding non-cancer diseases. My own considered view of this issue is that when radiation affects hormonal systems, such as the thyroid gland or the immune system, that a number of health vulnerabilities are created. The scientific evidence as well as the testimony of affected people, especially those in hot spots such as Idaho, should provide enough evidence to you to make more comprehensive recommendations about the range of diseases to be included in the compensation program. I would be happy to meet with you to discuss this further and to provide more details to your panel.

I know that your charter does not include consideration of future tests as a security or policy issue. But, in my view, you cannot fail to note the potential health and environmental consequences of underground tests. First of all, there were very large releases of [radioactivity](#) from about 30 underground tests between 1962 and 1970. The last one of these was the Baneberry test on December 18, 1970, which released an estimated 6.7 million curies of [radioactivity](#). I recommend that the RECA program should include all tests until the Baneberry test.

Second, the future health consequences of underground testing cannot be ignored, just because there are not yet manifest. It is true that iodine-131 is unlikely to be a significant issue in a present-day underground test due to its short [half-life](#). But recent research indicates that long-lived radionuclides, including [plutonium-239](#), can migrate far more rapidly from the test location than thought when the underground tests were being done. Therefore, underground tests carry a risk of down-aquifer exposure, if I might coin a term. This risk is not well understood. It is a risk to generations far into the future to people who would have no clue about what happened to them. The testimony you have heard today shows that even in an open society the knowledge about risks from current events is hard to come by. Can you ignore what we are doing to future generations having heard what you did today? I urge you to include a caution that the potential for future exposure exists if more underground test are done. For the record, both the Snake River Alliance and IEER are opposed to further nuclear tests of any kind by anyone for health, environmental, and security reasons.



This caution is all the more necessary, given a sorry history on the part of the nuclear weapons community in regard to health protection. For instance, in April 1960, the alumni magazine of the School of Engineering of the University of California, which was and is the nuclear weapons contractor for Los Alamos and Livermore National Laboratories, blithely argued that 6,000 babies with major birth defects were an acceptable price of U.S. nuclear testing. They did this without consultation with the people of Nevada or Idaho or any other state. It is time for the academic scientific community to make amends for this less than democratic attitude, if I might put it as politely as I can. I believe it is imperative that you include a caution that past and future underground testing may produce ill-health in future generations via the water pathway, even if the magnitude of this risk is not well understood. Please do take note of the fact that 200 years ago, no one would have predicted the rise of a vast neon-lit city in the Nevada desert. Las Vegas stands just 80 miles from the test site. The [half-life](#) of plutonium-239, as you know, is over 24,000 years.

I would like to say a word about multi-generational effects. Exposure of female fetuses creates risk to their children at least, since the ova are formed in utero. This simple fact should be taken into account in your deliberations.

I want to call your attention today to the health care aspects of the problem, including preventive health care. The government cannot ignore this responsibility for risks that it knowingly created and inflicted on its own people. The problem of milk contamination with iodine-131 has been understood since at least 1951. The government informed Kodak and other film-making companies about radiation risks to their products, but did nothing to protect the milk supply of the country. It is urgent to make amends generously and compassionately. I hope you will reflect that sense of urgency and compassion in your study.