

## 0) Introduction

The Manhattan Project in the US covered every stage of the production of nuclear weapons. This included the mining and refining of uranium, enrichment to 80 to 90% U235 for uranium bombs, fuelling nuclear reactors with uranium to produce plutonium, and reprocessing the spent fuel to extract the plutonium for plutonium bombs. It was recognised from the beginning that these processes and plants would give rise to radioactive releases, which would be harmful to the plant operators and the general public, yet they were never informed. This continues to the present day, when the nuclear weapon and power industry does everything in its power to deny and underestimate the many and extensive harms done to all living things. To this has been added the use of uranium in bunker-breaking bombs and tank-busting shells, that spread the dust so formed over their own forces, the enemy forces, and innocent bystanders, harming them all for generations to come. The human harms include many and extensive cancers, and also non-malignant diseases such as stillbirths, deformities and mental impairment and heart disease. With so much harm already done to humans that will take up to lifetimes to express, and so much nuclear debris laying in wait to harm even more humans, it is essential to identify every strategy and measure that can reduce the total harm.

## 1) Cancer in Context

1.1) 'In 2010, about six hundred thousand Americans, and more than 7 million humans around the world, will die of cancer. In the United States, one in three women and one in two men, will develop cancer during their lifetime. A quarter of all American deaths and about 15 percent of all deaths worldwide, will be attributed to cancer. In some nations, cancer will surpass heart disease to become the most common cause of death'. (Ref. 'The Emperor of All Maladies: A Biography of Cancer', Siddhartha Mukherjee, 2011).

1.2) In principle, it should be possible to determine the causes of all cancers. One take is given in 'Causes of cancer', [https://en.wikipedia.org/wiki/Causes\\_of\\_cancer](https://en.wikipedia.org/wiki/Causes_of_cancer) However, this holds that: 'Low-dose exposures, such as living near a nuclear power plant, are generally believed to have no or very little effect on cancer development.[73]'. But another view, supported by extensive evidence, is that a given dose of nuclear radiation causes around 600-fold cancers.

1.3) According to Cancer Research UK, 15% of cancers are caused by smoking and 6% by obesity. (Ref. 'Statistics on preventable cancers', <https://www.cancerresearchuk.org/health-professional/cancer-statistics/risk/preventable-cancers> ).

1.4) 'Exposure to less than optimum levels of the 14 factors was responsible for 42.7% of cancers in the UK (45.3% men, 40.1% women) a total of about 134,0000 cases'. (Ref. 'The fraction of cancer attributable to lifestyle and environmental factors in the UK in 2010', Parkin et al, 2011, <https://www.nature.com/articles/bjc2011474.pdf>).

1.5) The fraction of cancers attributable to nuclear radiation is about 15 to 25%, according to Dr John Gofman. (Ref. 'Radiation-Induced Cancer From Low-Dose Exposure: An Independent Analysis', John Gofman, 1990 (a book of 640 pages), <https://ratical.org/radiation/CNRACCAO4LoRC1986.pdf> Page 569).

'The separate contributions from other carcinogens to the population's total cancer mortality are hardly quantified at all. My estimates of the risk-per-rad from ionizing radiation are consistent with some 15 to 25 percent of all human cancer being caused by ionizing radiation (see box). Radon injects considerable uncertainty into the range. Ionizing radiation may even turn out to be the most important single carcinogen to which large numbers of humans are actually exposed. No one can possibly be sure yet, in the absence of equally good epidemiological data on all the other human carcinogens and on the magnitude of human exposure to them'.

1.6) So the causes of cancer are smoking 15% (from 1.3), obesity 6% (from 1.3), 14 lifestyle and environmental factors is 42.7% (from 1.4), and nuclear radiation roughly 15 to 25% (from 1.5), for a total of 78.7 to 88.7%.

1.7) Nuclear radiation also gives rise to stillbirths, deformities and mental impairment, among non-malignant diseases. (See: Dr Ernest Sternglass, 'Secret Fallout', <https://ratical.org/radiation/SecretFallout/SF.pdf> Pages 112, 113, and Alexey V. Yablokov, 'Chernobyl: Consequences of the Catastrophe for People and the Environment', 2009, [http://www.strahlentlex.de/Yablokov\\_Chernobyl\\_book.pdf](http://www.strahlentlex.de/Yablokov_Chernobyl_book.pdf) Page 58).

## 2) Radioactive Releases

The five most important events that released large amounts of radioactivity locally and worldwide are:

- 2.1) The atomic bombs dropped on Hiroshima and Nagasaki in 1945.
- 2.2) The subsequent atomic and hydrogen bomb tests conducted in the atmosphere until banned partially in 1963 and comprehensively in 1996.
- 2.3) The disaster at the Chernobyl nuclear power plant, with the melt-down of one reactor, in 1986.
- 2.4) The disaster at the Fukushima nuclear power plant, with the melt-down of three reactors, in 2011.
- 2.5) The use of uranium penetrator weapons in the Gulf Wars, Afghanistan, Kosovo and elsewhere.

### **3) Nuclear Radiation and Human Harms**

3.1) Many early studies of infant mortality and other harms near nuclear power plants were published by Dr Ernest Sternglass. He summarized his work in his 1981 book ‘Secret Fallout: Low-level Radiation from Hiroshima to Three-Mile Island’, <https://ratical.org/radiation/SecretFallout/SF.pdf> This has 183 pages, of which I would highlight pages 112 and 113.

Page 112 includes: ‘Tragically, it now appears that we had unwittingly carried out an experiment with ourselves as guinea pigs on a worldwide scale. This discovery made me more determined than ever to do everything in my power to make sure that the terribly costly lesson would be learned before mankind would make further and perhaps more irreversible mistakes with fallout from nuclear war or nuclear reactor accidents, in which the radioactivity equivalent to a thousand Hiroshima bombs might suddenly be released over vast areas the size of entire states or nations’.

Page 113 includes: ‘It was, in fact, the extremely sharp decline in the number of very high-scoring students that presented the greatest potential problem for a society increasingly dependent on verbal and mathematical skills to run the computers, design the automated machines for the factories and farms of the future, administer an increasingly high-technology society, and operate the sophisticated electronic weapons of a modern army. Instead of 189,300 students who had been able to score above 600 in the verbal test among those born in 1952-53, there were suddenly only 110,300 for the birth years of 1957-58, a drop of 42 percent. And an even greater drop occurred for the top students on whom our society would depend for much of its new ideas, creativity, and leadership skills in the arts, the sciences, and engineering, namely those who were able to score over 700. In this category, the numbers were cut by more than half, from a high point of 33,200 born before the Nevada tests began in 1949-50 to a low of only 14,800 for those born in 1957-58, the years of the heaviest fallout from our weapons testing’.

3.2) A detailed account of the American origins of nuclear weapons and nuclear power was written by Harvey Wasserman, Norman Solomon and others in 1982: ‘Killing Our Own: The Disaster of America’s Experience with Atomic Radiation’, <https://ratical.org/radiation/KillingOurOwn/KOO.pdf> This is a book of 250 pages.

The Introduction by Dr. Benjamin Spock includes:

‘It seems no accident that we are currently suffering from a national cancer epidemic, in which one of every five Americans dies of that dread disease. It would be plausible and prudent to assume that the radioactive fallout we’ve introduced into the global atmosphere, literally tens of tons of debris from bomb tests alone, is a significant factor in addition to industrial pollution and cigarette smoking. As early as the 1950s the American Linus Pauling and the Russian Andrei Sakharov—both Nobel prize winners—warned that literally millions of people would die worldwide because of these bomb tests.

There have been American “guinea pigs” who have amply confirmed these predictions. As this book documents for the first time, shortly after the blasts at Hiroshima and Nagasaki, American soldiers were sent in to help clean up the rubble. They were not warned that there was a danger in drinking the contaminated water and breathing the radioactive dust. Many of these men felt the lethal effects of the bombs’ radiation almost immediately. Despite glib assurances from our government, they have suffered an extraordinary rate of rare cancers that could only have been caused by that radiation.

Similar tragedies have struck American soldiers present at scores of bomb tests that followed. From 1945 through the early 1960s, some 300,000 men and women in U.S. uniform were exposed to radiation from atmospheric, underwater, and underground bomb tests. The military wanted to know how armies would react to atomic weaponry in war and they used American soldiers to find out. Though the Pentagon has insisted all along that there was little or no danger from these tests, the authors here present irrefutable evidence, which has only gradually come to light, that many of our GIs have suffered and died from leukemia, cancer, chronic respiratory distress, progressive muscular weakness, and mental disturbance. Most tragically of all, some of their children have been born with physical and mental handicaps.

Yet in spite of overwhelming evidence, the Veterans Administration has adamantly refused to admit there is any proof that these illnesses are service-related, the vets and their widows and children have been consistently denied compensation. Of course, no individual case of leukemia or cancer or birth defect carries a label saying exactly what caused it. But the statistics, gathered by the veterans themselves, show that the tests were responsible.

With shocking callousness, our government has even refused to divulge the list of those hundreds of thousands who were deliberately exposed, a list that would greatly aid in the early detection of further cancers and save hundreds of lives.

Civilians unfortunate enough to live downwind from the tests, in towns like St. George, Utah, and Fredonia, Arizona, have also suffered disease and death. They were assured by the Atomic Energy Commission that the radiation would not harm them. But in ensuing years they have been afflicted with an outbreak of cancers and leukemia that could only have come from the test fallout. Yet, like the veterans, they have met a stone wall of governmental denial.

Frightening stories are also coming to light among people and animals living near nuclear weapons facilities, mining and waste storage sites, uranium processing plants, and nuclear power reactors. Farmers in central Pennsylvania, for example, began to observe abnormalities in their animals when Three Mile Island Unit One opened in 1974. They reported much worse problems in the wake of the accident at Unit Two in 1979. Many animals became infertile. Others developed bizarre behavior. Young were born with marked deformities. These farmers had seen such abnormalities only rarely in the past. Now they were occurring repeatedly and on many farms. But government investigators turned in reports that baldly denied a majority of the abnormalities, which had already been witnessed by neutral observers. In fact, the investigators never even visited some of the farms they reported on.

They blamed what few disturbances they admitted to finding on mismanagement and ignorance on the part of the farmers. Farmers living near the Rocky Flats plutonium factory in Colorado, near the West Valley atomic fuel reprocessing center in upstate New York, near a uranium mining waste pile in Colorado, and near four separate reactor sites—including Three Mile Island—have complained of similar defects and illnesses among their animals.

They have documented the same kind of problems that first appeared back in the 1950s in sheep caught downwind from nuclear test blasts.

Parallel evidence is now in hand, from private citizens and independent researchers, that the rates of infant mortality and cancer and leukemia have risen among humans living near nuclear reactors. The government response has again been a condescending and blanket denial.

The government's own record of health studies has been stained with serious scandal and obvious cover-up. In the 1960s, the Atomic Energy Commission engaged a topflight expert named Thomas Mancuso to look into the health of workers at nuclear facilities such as the Hanford weapons plant in Washington state. But when he discovered, after more than a decade of research, that there was an elevated cancer rate at Hanford, the government fired him and tried to confiscate his data. Other top scientists, including Drs. John Gofman, Alice Stewart, Karl Z. Morgan, Rosalie Bertell, and Irwin Bross, have been censored, harassed, fired, or deprived of their grants for standing by their studies, which showed that humans and animals were being harmed'.

Page 56 includes: 'And she pointed through the living-room walls toward the homes of neighbors in the residential area. She had compiled a list of thirty-one cancer victims who lived in the houses within a block radius;21 smoking was rare in the heavily Mormon community.

"They couldn't pay anyone for the loss of a child. I hope they realize that," she said, hands folded in her lap.

"And the people of my generation are just dropping by the wayside."22

Punctuated by her special kind of laughter, and silences, eyes often brimming with tears, Irma Thomas shared her perceptions about living in a town A-bombed by its own government....'.

3.3) Another researcher was Dr John Gofman, formerly of the nuclear industry, but later a committed critic. He too has written a book: 'Radiation-induced Cancer from Low-Dose Exposure: An Independent Analysis' of 1990.

<http://blog.livedoor.jp/omb2012/%E3%82%B4%E3%83%95%E3%83%9E%E3%83%B3/Radiation-Induced-Cancer-from-Low-Dose-Exposure-.pdf> This is of 640 pages.

Page 500 includes: 'Estimate of Chernobyl-Induced Cancers:....

So the bottom line from the 1986 estimate is 970,500 malignancies, from the radio-cesium dose'.

In contrast, the consequences estimated using the prevailing ICRP model are only 'thousands', (Ref: 'Chernobyl's Legacy: Health, Environmental and Socio-economic Impacts...', The Chernobyl Forum: 2003–2005, Second revised version, <https://www.iaea.org/sites/default/files/chernobyl.pdf> ).

3.4) Another book on nuclear harms is 'A Primer in the Art of Deception' by Paul Zimmerman, 2009.

<https://nonuclear.se/files/zimmerman200908deceptionHiroshimaStudy.pdf>

This is of 795 pages, of which references cover 55 pages. Here are some chapter headings:

Page 138 has 'The Most Heinous Crime in History: The Betrayal of Mankind by the Radiation Protection Agencies'.

Page 587 has 'A Short History of Radiological Warfare'.

Page 665 has 'The Mentality of Genocide'.

3.5) Undoubtedly the most active researcher on nuclear radiation and human harms in recent decades is Professor Chris Busby. His CV of 32 pages is at: [https://www.academia.edu/35142675/Curriculum\\_Vitae\\_August\\_2017](https://www.academia.edu/35142675/Curriculum_Vitae_August_2017) He is best known as the Scientific Secretary of the European Committee on Radiation Risk (ECRR), which was set up to challenge the self-appointed International Commission on Radiation Protection (ICRP). To date, almost all countries accept the 'standards' of the ICRP. The most recent version of the ECRR Recommendations is ECRR2010,

<https://www.nrc.gov/docs/ML1523/ML15239A858.pdf> This has 258 pages.

Page 8. 'The success of the ECRR model is that it gives the correct answer to the question about the numbers of cancers or other illnesses that follow an exposure to internal fission products'.

Page 10. The ECRR was founded in Brussels in 1997.

Page 13. ... 600-fold error..., 500-1000-fold, 600-fold, current cancer epidemic, Uranium photoelectron enhancement ... shows uranium to be hundreds of times more dangerous than is currently modelled by ICRP.

Page 14. 'In early 2009, the Scientific Secretary of ICRP, and editor of both its 1990 and 2007 reports, Dr Jack Valentin, resigned. At an open discussion in Stockholm between him and Prof Chris Busby of ECRR on April 21st 2009 he stated that the ICRP risk model could not be employed to predict or explain the health effects of exposures to human populations. This was, he continued, because the uncertainties for internal exposures were too great, a matter in some cases of two orders of magnitude. This has been the contention of ECRR since its formation, and is written down in ECRR2003. Valentin also stated (in this video interview) that *since he was no longer employed by ICRP he could say that he thought it was wrong for ICRP and UNSCEAR to ignore the Chernobyl and other effects raised by the literature reports and by ECRR..*'

Page 110. 9.8 The Second Event Theory. (Dr Busby proposed this for radioactivity harming DNA, the genetic material).

Page 116. 10.1 Basics of the ECRR risk model. Primarily, the model is based on empirical data on internal exposures to fission-product radionuclides and Uranium in the fallout from atmospheric weapons tests.

Page 152 Uranium is primarily genotoxic. Exposure to Uranium causes genetic and genomic changes and therefore impacts most organs in mammals. Particularly targeted are the kidney, the brain and the reproductive system. A list of reported conditions associated with Uranium exposure is given in Abu Quare and Abou-Donia 2002 and Craft et al 2004. Bertell 2005 has reviewed the area and drawn attention to significant gaps in knowledge and recently a number of authors have discussed the problem in a UN report (UNIDIR 2008). The teratogenicity of exposure to Uranium weapons aerosols is reviewed by Hindin et al (2005). Many reports of congenital defects in children born in Iraq following the first and 2nd Gulf wars (e.g. Hamburg 2003) have not been followed up by any studies by WHO or any responsible authorities.

Page 184 lists those who contributed to ECRR2010, including 24 Professors and 20 Doctors.

3.6) Here is a less formal article from 2016: 'Radioactive radiation is the true cause of most cancer',  
<https://owndoc.com/cancer/radiation-true-cause-of-cancer/>

This includes: 'The data is unequivocal: Starting in 1950, Swedes were getting more cancer. Ten years later, their cancer rate had doubled. Fifteen years after that, their cancer rate had doubled again. In 1990, their cancer rate was five times higher than that in 1950. And today their risk of getting cancer is six times higher than when it suddenly started to rise in 1950. And it's not that's it's just happening in Sweden: Cancer is getting out of control worldwide:' (See: graph). 'Drop in cancer coincides with closed nuke plants

Note how in 1990, UK cancer mortality rates saw a very sharp and very significant, sustained drop around 1998, 1999, 2000. What happened in the UK during that time? They closed a dozen ailing old nuclear reactors. Two Magnox reactors, an obsolete design used to produce Plutonium for nuclear weapons, were closed in the UK in 1989. The Dorset-Winfirth plant comprised of nine nuclear reactors and it was decommissioned in 1990. Do you see the leveling off of the cancer rate in 1981 and 1982? In 1981, the UK closed the Sellafield-Windscale plant'.

And: 'Alpha-induced DNA damage cannot be repaired

A particularly damaging molecule can cause a single cut in the double helix of the DNA molecule, and this is rapidly repaired. Such damage occurs all the time in every cell and the body has very many ingenious and highly effective ways to constantly repair this damage. Because of this ingenious repair system that even protects us against serious DNA damage and malignant mutations caused by cosmic gamma rays, in order for cancer to occur, what's needed is much more serious damage to the DNA: The complete shredding of entire parts of chromosomes, causing hundreds or thousands of double-breakages in the DNA of millions of cells, all the time, day after day, all over the body, with a million cells a day, every day. There really needs to be an onslaught of this kind of damage for a long time, because the immune system has no problem killing off cancerous cells and even entire tumors when they're still tiny. Researchers are searching for all kinds of indirect causes of cancer, such as chemical pollution that somehow interferes with our immune system or cell apoptosis, but they're ignoring the elephant in the room: The fact that DNA damage serious enough to cause cancer is very unusual. It's not natural. Cancer used to be very rare before WW2, and virtually non-existent before people started smoking. There is very little that can cause really serious DNA damage. There are some particularly dangerous chemicals that can do that, but no scientist thinks those are the cause of the cancer pandemic. Apart from very carcinogenic chemicals that are not present in our food, the only thing that can cause such DNA damage is a certain type of radiation: Alpha radiation'.

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