

## Chernobyl—The Untold Truth

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*[More reason to rethink nuclear energy—seriously]*

There are many reasons for rejecting the nuclear option economy as thoroughly reviewed in an ISIS [Institute of Science in Society] Report *Green Energies—100% Renewable by 2050*. One of the biggest question marks hanging over the industry is the potential of another catastrophe on the scale of Chernobyl, or worse.

The industry and its friends insist that there is nothing to worry about; both the design and the operation of nuclear power plants are far better now than they were in 1986, and there is really no chance at all that anything like Chernobyl could happen today.

For those who do not believe that any industry can operate for a long time without a serious accident - and given the current disaster in the Gulf of Mexico there must be even fewer who do - they have a second line of defence. Considering that Chernobyl was by far the worst nuclear accident that has ever occurred, it caused remarkably little harm : at most a few thousand deaths and about four thousand cases of thyroid cancer. The number of deaths per unit of energy produced has been much less than in coal mining. Far from being especially hazardous, nuclear is one of the safest ways of producing energy.

Unfortunately, the figures the industry quotes bear little relation to reality. Chernobyl did far more harm than they admit. Evidence for this has been available both in the former Soviet Union and in the West for some time. A long and detailed review has recently appeared in the *Annals of the New York Academy of Sciences*, co-authored by scientists uniquely qualified to write on the issue.

Alexei Yablokov is a corresponding member of the Russian Academy of Sciences and a leading Russian environmental scientist who has been a vice-president of the International Union for the Conservation of Nature. Vassily Nesterenko, now deceased, was a member of the Belarus Academy of Sciences. In 1986, he was director of the Institute for Nuclear Physics in Minsk. He began his work on Chernobyl the day after the explosion by flying in a helicopter over the reactor to help assess the damage; the radiation he received eventually led to his death in 2008, shortly before the review paper appeared. In 1990, with the help of the famous physicist Andrei Sakharov, he founded the Independent Institute for Radioprotection (BELRAD). After his death, the directorship passed to his son, Alexei Nesterenko, the third author.

### HOW MANY DEATHS?

The usual figure given for the number of deaths due to Chernobyl is 4000. Of these, 56 were killed in the explosion or received high doses- of radiation and died soon after, and the rest are an estimate of the additional deaths (i.e. more than would otherwise have been expected) from cancer that would eventually occur in Ukraine, Belarus and Russia in people who were exposed to lower doses of radiation. Little or no mention is ever made of deaths in other countries, or illnesses other than thyroid cancer. That is the assessment of the Chernobyl Forum, a group set up by the International Atomic Energy

(IAEA) though with representation from other bodies. Commentators generally ascribe these figures to the IAEA and the World Health Organisation (WHO), thereby giving them greater credence. But WHO has not carried out its own studies and reached the same conclusions as the IAEA. In practice, it is the industry-oriented IAEA that is solely responsible.

Most estimates of the death toll are much higher than those of IAEA. The TORCH report estimates that there will be between 30,000 and 60,000 cancer deaths due to Chernobyl, and Yablokov estimates 225,000 in Europe and 19,000 in the rest of the world. Yablokov also estimates that several hundred thousand people in the territories have already died from cancer and other conditions caused by Chernobyl. The Russian Academy of Sciences suggests there have already been about 200000 Chernobyl-related deaths over the past decade and a half, in Russia, Belarus and Ukraine. The Belarus Academy of Sciences estimates 93000 deaths so far in Belarus; and the Ukrainian National Commission for Radiation Protection estimated 500000 in Ukraine. These figures include deaths from conditions other than cancer.

It is, of course, very difficult to estimate the number of deaths due to Chernobyl. Many of them have not happened yet, and even looking back it is generally hard to be sure that the cancer that killed a particular individual twenty or more years after the event was caused by the radiation. Instead, experts have to compare the number of cancer deaths in a contaminated area with the number that they would have expected to occur had there been no contamination. The difference, the number that can be attributed to Chernobyl, can be only a rough estimate because of all the uncertainties in the calculations. What stands out, however, is that the lowest one by far, by a factor of at least two orders of magnitude, comes from an agency that was set up to promote nuclear technology.

### **HOW MANY ILL?**

Estimating the number of people made ill from the effects of Chernobyl is also difficult. The accident occurred while Ukraine was part of the USSR, and the health data were kept secret for the first three years. The Soviet authorities, notoriously anxious to minimise the consequences of any incident, deliberately falsified the statistics; for example, hospitals were instructed that where there were no obvious signs of radiation sickness, the records should neither include the dose of radiation received nor mention that the patient had been a "liquidator" (one of the estimated 800000 who participated in the emergency or cleanup operations).

The lists of liquidators are themselves unreliable as evidence because it is seldom possible to know how long (if at all) any individual was exposed to radiation, while many who were exposed are not on any list. There was also the inevitable problem that much of the evidence comes from health workers who were naturally more concerned with helping their patients than recording data in a form suitable for research.

Despite all these obstacles, many scientific papers have been published. They give a powerful and convincing picture quite different from the claims of the Chernobyl Forum. The complacent IAEA reports are in stark contrast to what is being observed by people on the ground. Doctors and other medical health workers in the former Soviet Union and other countries are reporting far more deaths and radiation-related illnesses than the official figures show.

Most of the data are from the former Soviet Union, but some are from other countries, where more than half the radionuclides from Chernobyl fell. For instance, there was a 49% increase in Down's syndrome in the most contaminated districts of Belarus in 1987-1988. Large increases were also reported in West Berlin, in the northeast of Sweden (the most contaminated part of the country) and in the Lothian district of Scotland, also an area that received a higher dose than average for the country as a whole. This is where detailed studies are especially important : the evidence for the effects of radiation can be masked if one combines data from areas that received high doses with those from areas of the same country that received much lower doses.

The review covers a wide range of illnesses, most of which the lay person might not think of as radiation related, but which have clearly increased in areas where the radiation doses were high. The figures on cancer are very worrying. In Belarus, for example, in the period 1990-2000 cancer morbidity went up by 40 percent, with the highest increase in the most highly contaminated province, Gomel. In Ukraine, cancer morbidity rose by 12 percent, with again the greatest increase in the most contaminated districts. There was also excess cancer morbidity in the heavily contaminated districts of Russia. It has been estimated that Chernobyl caused 500 deaths from cancer in Bulgaria and more than a thousand in Sweden between 1986 and 1999.

### **CONCLUSION**

Reading the long, detailed and carefully referenced account of the harm caused by the Chernobyl explosion is a very sobering experience. It is in stark contrast to the summary of the report of the Chernobyl Forum: "Apart from the dramatic increase in thyroid cancer among those exposed at a young age, there is no clearly demonstrated increase in the incidence of solid cancers or leukaemia due to radiation in the most affected population. There was, however, an increase in psychological problems among the affected population, compounded by insufficient communication about radiation effects and by the social disruption and economic depression that followed the break-up of the Soviet Union."

In the USSR, dissidents were sometimes locked up in mental hospitals on the grounds that anyone who could not appreciate how wonderful the Soviet system was must be mad. With cruel irony, and in the face of all the evidence to the contrary, the Chernobyl Forum now insist that hardly anyone was affected by the Chernobyl explosion and anyone who is worried about it must have psychological problems. □□□