



Meeting Highlight

In the Shadow of Chernobyl—A Report of the First International Conference of the European Commission, Belarus, Russian Federation and Ukraine on the Radiological Consequences of the Chernobyl Accident, 18–22 March 1996, Minsk, Belarus

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WE HAVE now been living in the shadow of the Chernobyl nuclear power plant accident for just over 10 years. Slowly, the mist rises and the realities—the consequences of this so far largest nuclear reactor accident ever, exposing some 5 million people to ionising radiation from fallout of radioactive nuclides—become evident. The early short-term exposure was to radioactive iodine (half life 8 days) whereas the long-term exposure will be to caesium 137 (half life 30 years). During these 10 years, a number of alarming reports attributed huge numbers of excess deaths, cancer cases, malformations etc. to the accident. Many of the reports have been proven wrong or a misinterpretation of cause and effect, and misinterpretation of the general morbidity and mortality figures for the areas. For instance, the cumulative all cause mortality since the date of the accident have been quoted as being related to the accident. Such stories have been supplemented with press released case stories of malformations without knowledge of the background rate of malformation in the populations, as well as a number of diseases (including cancers), which have never been related to ionising radiation, or which are reported almost a decade too early to be related to the radiation exposure. However, 10 years have now passed and more scientifically sound data have emerged.

The conference was held in Minsk, Belarus and the organisers from the Nuclear Fission Safety Programme of the European Commission deserve special mention for perfect organisation in an area where the infrastructure normally would be prohibitive of such a large international gathering, with more than 700 participants from 33 countries. The conference was centred around the 16 EC initiated and funded collaborative projects between the scientists of Russia, Belarus, Ukraine and the EC countries. The topics discussed were: transfer of radioactive material through the

environment and into the food chain; decontamination strategies and restoration measures; investigations of the accident's effect on health; and the development of emergency management procedures for the improvement of overall emergency preparedness. Final reports from all these projects were made available by the European Commission (EUR 16527–16542). To assist the participants following the simultaneous translation in Russian and English, the conference proceedings (EUR 16544 EN) were available from the first day, and this was very helpful to avoid misunderstandings and to focus the discussion of a huge amount of new data covering a broad spectrum.

The environmental consequences revealed that the soil type is a crucial factor affecting the rate of transfer of radioactivity (caesium 137) to agricultural products, and the main future exposure will come from private farming where appropriate counter measures are not taken, and from ingestion of wild mushroom, berries and game. The countermeasures taken on the river systems (avoiding flooding) keeps doses in the drinking water below the intervention level, and only fish in the waters near to the Chernobyl plant are of concern.

The health consequences were severe amongst the 444 people immediately exposed to large radiation doses at the reactor site. 2 died immediately, 300 were suspected to have suffered from radiation sickness, of whom 135 were confirmed, 37 with life threatening disease. 28 died during the first 3 months and later another 14 died of diseases unrelated to radiation. Treatment of radiation sickness were improved by the use of growth factors and, for those highly exposed, by bone marrow transplantation.

The most exposed—the clean-up workers (“liquidators”), including 5000 soldiers who worked on the roof of the reactor—will be the important group to follow to increase our knowledge on long-term radiation effects. However, the number still increases (currently, over 600 000 liquidators

are on file) as anybody entering the contaminated areas for work duties (exposed or not) are listed as a liquidator, and are so entitled to the social benefits linked to this status. Studies should therefore concern those working in Chernobyl and the 30 km zone in the first year after the accident. A pilot study revealed that this is feasible, and co-ordinated action in the Baltic countries, in the Ukraine, Belarus and Russia, is under way. A publication of the incidence of leukaemia after 10 years among liquidators in Belarus demonstrated an increasing incidence, but similar to that seen in the general population and, more interestingly, a similar increase in chronic lymphocytic leukaemia (CLL) was seen, which is not considered to be radiation-induced. A study on leukaemia among the population in the contaminated areas of the Ukraine point to a possible ascertainment bias immediately after the accident as explanation for the increase. The joint European study on childhood leukaemia and lymphoma incidence (ECLIS), comparing areas in Europe with varying degrees of contamination, have, after 5 years of follow-up, not been able to demonstrate any increase in risk or variation in risk by levels of contamination.

The most striking finding of this accident is the highly increased risk of thyroid cancer in children and young adults. Only 3 children have died from this disease, but more than 700 are now diagnosed, starting a couple of years after the accident until today, where less than 50–100 were expected based on the occurrence prior to the accident. The international panel excluded that this may be explained by a screening effect or other major diagnostic deficiencies before

the accident. The surprise is not the occurrence of thyroid cancer (from radioactive iodine), but the early occurrence only 4 years after the accident. It is noteworthy that this excess is related to the birth-cohorts of young adults and children, and that future generations will not suffer from this consequence. Nevertheless, it is estimated that some 4000 of the children and young adults at the time of the accident will contract thyroid cancer during the next 50 years.

Psychological stress in the aftermath, movement of populations, anxiety and fear will definitely be an important factor in the future that deserves study. Many scientists following the populations health noted this, but it should be made clear that such effects are accident-induced and not radiation-induced.

The Chernobyl accident will cast a shadow over us for many decades, although the shadow does not seem to be as dark as many predicted. Nevertheless, it is there, and even now with the knowledge on thyroid cancer and leukaemia, it is still too early to exclude that we will not, in the future, see the same effect for solid cancers as seen in Japan after the atomic-bomb, particularly since the radiation dose accumulates slowly in people living in contaminated areas. One can only hope that the EC supported initiative may continue to exploit the consequences for the benefit of us all in the event of a new accident, and that the infrastructure of the Newly Independent States improves and survives so it is possible to follow both the cancer incidence and mortality, adequately linking this information to the formed Chernobyl registers.