

Chernobyl's Living Legacy

by Fred A. Mettler

Twenty years later, the April 1986 Chernobyl accident lives on in different ways — in fact and fiction.

Today, national and international experts from eight United Nations agencies including the IAEA are working to sift fact from fiction. They are teamed with Belarus, Russia, and Ukraine to evaluate, document and report the accident's true scale. Known as the Chernobyl Forum, the group issued its comprehensive report in September 2005. It covers health and environmental consequences, and includes recommendations to channel assistance to where it is most needed.

Dr. Fred Mettler is a member of the Forum, and a Chernobyl veteran researcher — he served as the health team leader in an IAEA-led international project that first presented on-site assessments of Chernobyl's effects in the early 1990s, and participated in the International Chernobyl Conference in 1996 that summed up what was scientifically known then. In this essay, he revisits Chernobyl's health picture from personal and professional perspectives.

When I first visited the highly contaminated areas in the late 1980s as part of the International Chernobyl Project, our work was primarily conducted in highly contaminated small rural villages. I was profoundly impressed by the devotion and concern about children (something much deeper than I had ever seen in the Western world).

The villagers had a very limited view of their geographic surrounding and often only knew villages within 30 kilometer radius. Many families had lived in the same village for hundreds of years and had not seen foreigners since World War II. The radioactive fallout was rapidly followed by forced relocation of hundreds of thousands, the

rapid breakup of the Soviet Union, the collapse of infrastructure, the arrival of technology and access to mass media. All this permanently and adversely changed the lives, values and culture of the people.

Over the last 20 years there have been a number of scientific reports and estimates of the Chernobyl consequences. Certainly, in the first days of the accident there were uncertainties and confusion, but within a few months the levels and types of contamination were well known. Hundreds of thousands of workers (liquidators) were brought in to contain the situation. People in highly contaminated areas were relocated. Non-Governmental Organizations (NGO's) and various governments (particularly Japan and European) responded with scientific programs. The Soviet government instituted extremely large health and social welfare programs.

Evaluation of the health effects of the accident has been subject to many limitations. Not the least include lack of reliable baseline health data for many diseases, incomplete reporting, variable diagnostic criteria and lack of evaluation of a radiation dose-response effect. The health effects data has been further complicated by the breakup of the Soviet registries and lack of sharing of data among institutions. The non-radiation related high infant mortality, high use of tobacco and rapid decline in average lifespan throughout the former Soviet Union have also confounded data analysis. For example, the average lifespan of males in Russia as a whole has dropped from about 70 years of age to 58 in the last decade often due to alcoholism or suicide.

Distressingly variable and unsubstantiated claims in the media over the last two decades have caused confusion, doubt and a persisting problem for not only those directly



Alex and Tatjana Rjabushkin with their daughters Nastja and Masha, in front of Tatjana's parents house in Slavutich, a new town built after the accident. Masha, the youngest, was born in Slavutich. Alex, a manager at the Chernobyl plant, is hopeful for his and his family's future.

affected but also the rest of the world. In contrast, the scientific community has been rather consistent in its assessment. This is not surprising since there exists over 100 years of literature on the health effects of radiation. The current assessment of the Chernobyl Forum is not much different from those prepared by previous scientific forums including the 1990 International Chernobyl Project and the 1996 IAEA/UN/WHO "One Decade After" Chernobyl conference.

The accident released vast quantities of short-lived radioactive iodine over thousands of square kilometers. The radioiodine was subsequently concentrated in the thyroid gland of many persons primarily as a result of the grass-cow-milk ingestion pathway. A large increase in thyroid cancer has occurred among those who were children and adolescents at the time of the accident. There were about 4,000 radiation-related thyroid cancer cases as of the year 2000 and more are likely to occur in the future. The long term survival rate for thyroid cancer is usually about 90-95%. No definite radiation related increase has been found among those who were adults at the time of the accident.

For over 100 years it has been known that there is an increased risk of many types of cancer after radiation exposure. Several types of leukemia may occur within two to three years of exposure and the risk may persist for 20-plus years. Most solid cancers do not occur within ten years of exposure but the risk may persist for three to four decades.

In spite of most predictions, no definite radiation-related increase in leukemia or in cancers (other than thyroid) has been demonstrated to date in the population living in the Chernobyl area although a small increase has been found in a limited study of Russian liquidators. The lack of a detectable increase in cancer deaths among the general population

does not mean that no cancer deaths have occurred or that there is no radiation-related risk.

The exact number of radiation-related cancers due to Chernobyl will never be known. Radiation-induced cancers do not have a specific signature which would allow them to be differentiated from cancer due to other causes. The potential number of cancers can only be estimated by multiplying risk factors (from the Japanese atomic bomb survivor studies), the Chernobyl population size and the radiation dose.

A reasonable central estimate is about 4,000 fatal radiation induced cancers during the lifetime of the 600,000 most highly exposed individuals and perhaps another 5,000 in more peripheral populations. The number is small (representing a few percent) relative to the normal spontaneous risk of cancer, but the numbers are large in absolute terms. While any such estimates have some "uncertainty", the current findings are compatible with the risk estimates derived from Japan and clearly rule out the claims of "hundreds of thousands deaths" made by some anti-nuclear groups.

Congenital malformations have been a topic of great media and public interest. The data reviewed by the Chernobyl Forum shows that while congenital malformations are being more commonly reported over time, there is actually a higher rate in the areas with lower contamination and there is no clear relation to radiation exposure.

Has the Chernobyl story ended after 20 years? The answer is 'no'. The legacy will likely continue for several more decades.

The governments have spent huge amounts of money on social welfare programs that have done little to foster inde-

Chernobyl Forum

Two decades after the Chernobyl nuclear power plant accident, people in the region still live with wildly varying reports about what impact the accident will have on their families' future health and the environment. The IAEA initiated Chernobyl Forum is working to give people in the affected villages greater certainty and levels of assistance.

The Forum — comprising eight United Nations organisations, and Belarus, Russia and Ukraine — issued a comprehensive report in September 2005 that documented the true scale of the 1986 accident, and recommended actions to further assist people in the affected regions.

“The IAEA is committed to the **UN Strategy for Recovery**, and we agree with the recommendations of the Chernobyl Forum report,” said IAEA Director General Mohamed ElBaradei. “In particular, we stand ready to assist with the development of new initiatives that would help local populations regain control over their own livelihoods — through assistance with safe food production techniques, improved primary health care, and encouragement of private sector investment and development.”

See the IAEA's website at www.iaea.org for more information on the Chernobyl Forum and its report.



Dr. Mettler was part of the health team that checked children in Ukraine in the 1990s.

pendence and change. The population remains largely unsure of what the effects of radiation actually are and retain a sense of foreboding. A number of adolescents and young adults who have been exposed to modest or small amounts of radiation feel that they are somehow fatally flawed and there is no downside to using illicit drugs or having unprotected sex. To reverse such attitudes and behaviors will likely take years although some youth groups have begun programs that have promise.

Discussion of Chernobyl's effects almost always concentrates on the adverse outcomes. We should take time to realize that many of the actions of the first responders — fire fighters, liquidators, physicians and governments — were appropriate and probably saved tens of thousands of lives.

At first glance, the Chernobyl Forum findings would appear to have little relevance outside the former Soviet Union. Nothing could be further from the truth, particularly in the age of possible nuclear or radiological terrorism. Accessibility and rapid distribution of potassium iodide would have prevented most of the thyroid cancer cases. The experience gained by physicians in treating the 134 acute radiation sickness patients is invaluable. A lot of information has also been gained on dispersion and bio-pathways of radioactive cesium in both urban and rural environments.

Clearly established is the necessity of communicating accurate, timely and complete information to the public. Such information is needed for taking the right actions at the right time in the event of emergencies, and for recognizing and preventing the kind of long-term psychological issues that the Chernobyl accident so evidently raised.

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