Cancer Effects from Chernobyl 20 Years After

Elisabeth CARDIS

IARC—International Agency for Research on Cancer, Lyon, France

Today, nearly 20 years after the Chernobyl accident, there is (apart from the dramatic increase in thyroid cancer incidence among those exposed in childhood and adolescence) no clearly demonstrated increase in the incidence of cancers in the most affected populations that can be attributed to radiation from the accident. Increases in incidence of cancers in general and of specific cancers (in particular breast cancer) have been reported in Belarus, the Russian Federation and Ukraine, but much of the increase appears to be due to other factors, including improvements in diagnosis, reporting and registration.

Recent findings indicate a possible doubling of leukaemia risk among Chernobyl liquidators and a small increase in the incidence of premenopausal breast cancer in the very most contaminated districts, which appear to be related to radiation dose. Both of these findings, however, need confirmation in well-designed analytical epidemiological studies with careful individual dose reconstruction.

The absence of demonstrated increases in cancer risk—apart from thyroid cancer—is not the proof that no increase has in fact occurred. Based on the experience of atomic bomb survivors, a small increase in the relative risk of cancer is expected, even at the low to moderate doses received. Such an increase, however, is expected to be difficult to identify in the absence of careful large-scale epidemiological studies with individual dose estimates. It should be noted that, given the large number of individuals exposed, the absolute number of cancer cases caused by even a small increase in the relative risk could be substantial, particularly in the future.

At present, the prediction of the cancer burden related to radiation exposure from Chernobyl must be based on the experience of other populations exposed to radiation and followed-up for many decades. Such predictions are, of necessity, uncertain, as the applicability of risk estimates from other populations with different genetic and environmental backgrounds is unclear. They provide, however, an idea of the order of magnitude of the likely impact of the accident. Predictions of the number of cancer cases to date in Europe (including the contaminated regions of Belarus, Russia and Ukraine) and over 80 years will be presented, together with associated uncertainties.

In the next years, careful studies of selected populations are needed in order to study the real effect of the accident and compare it to predictions.

E-mail: cardis@iarc.fr