

IRSNINSTITUT
DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE

EFFECTS ON HEALTH

In France, the issues raised about how the accident affected health concern thyroid cancer

The estimation of the risk on the most sensitive population groups, i.e. children living in the east of France in 1986, shows that the theoretical number of thyroid cancer cases attributable to exposure from the accident fallout is low. It is on a similar scale as uncertainty about the number of cases of cancer that may spontaneously occur within this population group and it is therefore difficult to assess using an epidemiological approach.

IN 1986, THE DOSES RECEIVED BY THE POPULATION REMAINED VERY LOW (SEE SHEET 16)

The thyroid gland was particularly exposed, mostly to the iodine 131 found in food. The other radionuclides (caesium 137 and caesium 134) contributed very little to the dose. The issues raised about health risks thus focus on thyroid cancer.

The 2.3 million children under the age 15 living in the east of France in 1986 form the population group most sensitive to this risk as:

- the east of France was the worst affected by radioactive fallout from the accident,
- the thyroid gland in children is more sensitive to exposure to iodine 131 than in adults.



THE MEAN DOSES IN THE THYROID RECEIVED BY CHILDREN WERE ESTIMATED FOR 4 DIFFERENT AGES

The doses received by the thyroid depended mainly on the type of milk ingested (breast, formula, fresh, pasteurised milk, etc.), when it was consumed after contamination, the area of provenance and the quantity ingested. Regular consumption of over 150 grammes of goats' or ewes' cheese a day from the worst affected regions in the east of France between May and June 1986 may have resulted in doses received by the thyroid of about a hundred mSv.

However, the number of children having such eating habits in 1986 was very low.

Mean doses received by the thyroid in children in the east of France

	Thyroid dose comprised between
Infants	1.3 and 2.5 mSv
Children aged 1	6.6 and 13 mSv
Children aged 5	4.0 and 7.8 mSv
Children aged 10	2.1 and 3.9 mSv

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EXCESS CASES OF THYROID CANCER ATTRIBUTABLE TO THE CHERNOBYL ACCIDENT ARE DIFFICULT TO HIGHLIGHT

The mean doses in the above table are 100 times lower than those received by children in Belarus in whom an epidemic of thyroid cancer has been observed.

The risk study carried out by the IRSN and the French health watch institute in 2000 on children under 15, living in the east of France, showed that the excess cases of cancer estimated according to the different risk models are lower than or comparable to uncertainties regarding the estimation of the number of spontaneous cancer cases.

Estimation of spontaneous thyroid cancer cases and excess cancer cases due to the Chernobyl accident in children under 15 in 1986 and living in the east of France

Period	Number of spontaneous thyroid cancers cases	Excess of thyroid cancer cases due to the Chernobyl fallout estimated according to the different risk models
1991 - 2015	899 ± 60	from 6.8 to 54.9

Given the latency period of at least 5 years between thyroid exposure and the possible onset of cancer, the risk assessment carried out covers a period starting in 1991.

An explanation of the general trend in the increase in the number of cases of thyroid cancer noted in France since the beginning of the 1970s can be found both in progress in screening practices for this illness and the multiple risk factors that may cause this type of cancer.

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