Effects of ionizing radiation : new evidence, greater risks

par **Andreas NIDECKER**, Professeur émérite de radiologie à l'université de Bâle, Membre du Bureau IPPNW Suisse - Association Internationale des médecins pour la prévention de la guerre nucléaire (et ancien président de IPPNW Suisse).

Ionizing radiation is divided into alpha, beta and gamma radition. While alpha and beta emitters cause effects in a short distance only, this can be detrimental to health in the case, where such substances are ingested. Gamma radiation is highly energetic and able to penetrate structures and has an effect over large distances. Gamma radiation corresponds to x-rays and is used in medicine and industry. Well known effects of overexposure to ionizing radiation ranges from Erythema (skin reddening) to diarrhoea, loss of hair, seizures and death, depending on the dose received. Chronic exposure may lead to thyroid disease, leukaemia and different solid cancers.

So far radiation exposures below 100 mSv (MilliSievert) have not been considered dangerous to man, however newer publications from large epidemiological studies show effects down to a level of 1 - 5 mSv. Furthermore, there are now several peer reviewed studies available from populations in contaminated areas in the Chernobyl region, where there is clear evidence of genetic effects in the children. Other studies from England reveal genetic effects in children of workers in the nuclear plant of Sellafield. Lastly, in Chernobyl and Fukushima studies of animals have revealed genetic defects and diseases as well and there are also observations in plants, which reveal morphological changes in contaminated ares.

Ionising radiation is much more dangerous than so far considered and affects men, fauna and flora even in a low dose range. ICRP (Internatl. Commission of Radiation Protection) guidelines, based on previous studies may need to be adapted. In radiology the increased risks to health are well recognised today and the trend is, to use digital x-ray machines and CT-Scanners with much lower doses to patients. Better still is to replace x-ray methods with other imaging modalities as ultrasound and Magnetic Resonance.