WORKSHOP - 27.08.2010

IPPNW World Congress Basel

INCREASED CHILDHOOD CANCER RATES NEAR NUCLAR POWER PLANTS

NUCLEAR ABOLITION:

FOR A FUTURE!

FOR AN ADVANCED RADIATION PROTECTION

The closer a child lives to a nuclear power plant, the higher risk it has to develop cancer, in particular leukaemia.

This was proven in 2007, when the so called "KiKK"-study (Childhood Cancer near Nuclear Power Plants) was realised. The KiKK-study is the most accurate and intense investigation on this issue world-wide. However, the outcome has been watered down and belittled through precise lobbying and media activities not only by the nuclear industry, but also by scientists of the German commission on radiation protection (SSK, "Strahlenschutzkommission") and even by the scientists of the survey-leading institution "Kinderkrebsregister Mainz" (KKR) themselves. Therefore, necessary decisions have been procrastinated by the responsible politicians.

About the prologue of the "KiKK"-survey:

The decision to start the study was taken because the German statistician Dr. Alfred Körblein had reanalysed some previous surveys which revealed evidence of increased cancer rates near German nuclear facilities (1). But only a persistent will to expound the problems of these results and profound educational campaigns by the International Physicians for the Prevention of Nuclear War (IPPNW) drove the survey forth. Only after more than 10.000 protesting letters and signatures from the population to responsible politicians and public authorities, the federal office for radiation protection ("BfS", Bundesamt für Strahlenschutz) agreed to prepare a broad research contract and to mandate the KKR in 2003. The results have been published in the European Journal of Cancer (2), in the International Journal of Cancer (3) and on the webiste of the BfS (4) in 2007 and 2008.

The key question of the survey was: "Do radioactive isotopes emitted during standard operation of nuclear power plants lead to an increase of childhood cancer rates?".

All scientists having planned the study design did agree that the substitute value for the radiation exposure should be the distance to the power plant (5), because it would not be possible to measure the exposure directly. The survey was planned to have two parts (as case-control-study without and with questionnaire). The timeframe covered 24 years (from 1980 to 2003). This ensured the maximum possible amount of data; since 1980, data of childhood cancer had been collected by the KKR. Altogether, 1592 children with cancer and 4735 controls at all 16 nuclear power sites in Germany were included. The study area consisted of all districts around NPPs taking into account the prevailing wind direction. The investigation therefore reached areas with over 50 km distance from the power plants. To rule out misleading interpretation concerning the key question of the first part of the study, in the second part (the case-control-study with questionnaire) it was checked (via standardised forms), if

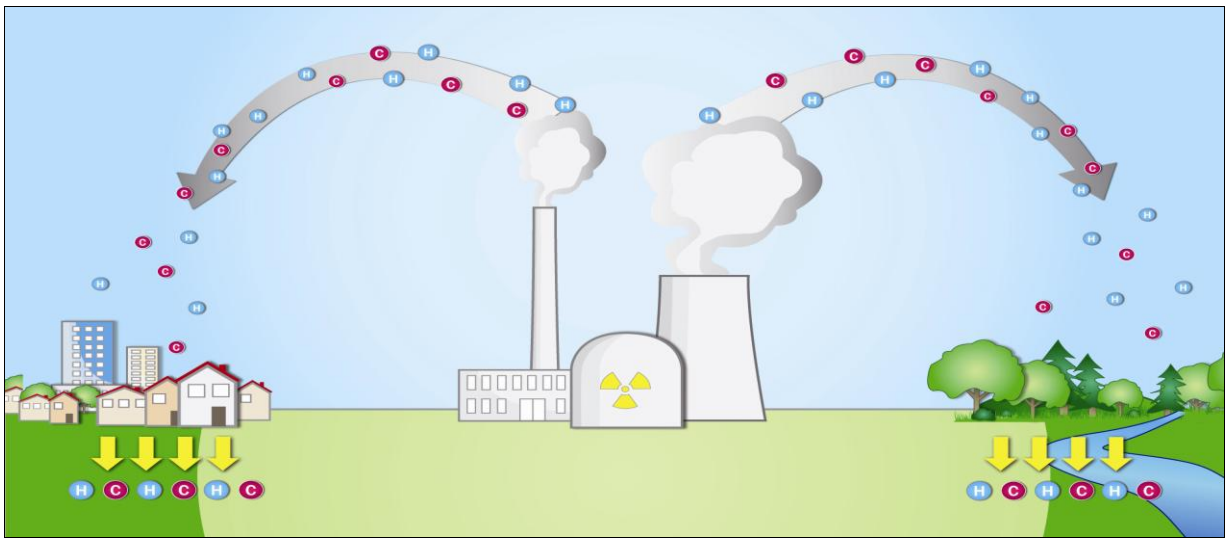
confounders could have been influencing the result significantly. For example, it was investigated if mothers before giving birth and fathers before procreation were exposed to radiation, if there had been contacts with insecticides or other toxic substances, if there was a familial clustering of allergies or diseases of the immune system. Even the socioeconomic situation of the families was taken into account. In addition it was considered if the emissions of one single plant could have been distorting the outcome. All this was ruled out.

The result of "KiKK" is highly significant and proves clearly:

At all 16 sites in Germany, where nuclear power plants are operated, children under 5 years of age have a higher risk to develop cancer, particularly leukaemia, the closer they live to the plant. The risk for them was most increased in a 5 km range around the plant, namely 60%. There were 77 children diseased instead of 48 expected statistically. For the subdivision of leukaemia the risk increase was even 120%: 37 cases instead of the expected 17. In other words, in the 5km range, 29 children suffered from cancer (thereof 20 from leukaemia), just because they lived in these areas. As the results are highly significant, they cannot be explained by coincidence, which -scientifically not reasonable- is tried until today by some scientists. The effect is even traceable in further distances to the reactors, but with decrescent clarity. Altogether, there were up to 275 cases more than statistically expected. Undoubtedly, this “negative risk-proximity trend” persisted throughout: The smaller the distance, the higher the risk.

The results of the KiKK study are in line with other studies.

Over 60 studies about cancer in the vicinity of NPPs have been done world-wide. KiKK is the most elaborated of them. Ian Fairlie draws the conclusion that most of the surveys prove increased cancer rates close to nuclear facilities (6). A standardised meta-analysis by Baker and Hoel (2007) reviewed 17 international studies which showed an increase of cancer and mortality rates close to nuclear sites not only for children but also for adults (7).



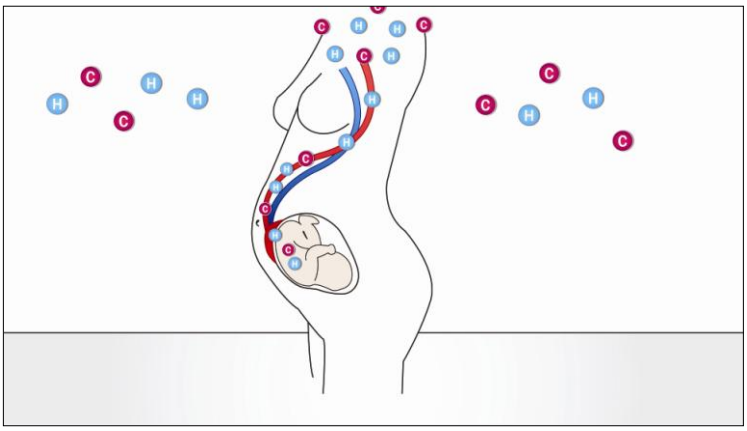
We now do know that children living near NPPs have a higher risk to develop cancer but we lack a gapless explanation how the plants make the children falling ill.

Evidence and simple logical thinking lead to the hypothesis that radioactive emissions which are released during standard operation of the plants must be considered as cause for the excess diseases. Since KiKK was published, scientists have a severe dispute on that.

Radioactive emissions, exposure limits, controls, levelling and corporate secrets:

Nuclear power plants emit constantly radioactivity via stacks and waste pipes. These emissions may remain within the legal limits, but the devil is in the detail: The measurements are done by the operators of the plants themselves, and are then forwarded to the responsible administrative office which has only to control the accuracy of the measurements. A further inconsistency is that only arithmetically averaged data are communicated which level all peaks and spikes down to low mean values. Measurements by the administrative office are infrequent and incomplete. Furthermore, the data are not published or communicated to universities or scientists, because they are treated as corporate secret. Meanwhile there is scientific evidence that the present assumptions and calculation models concerning radiation risk are wrong and emission limits derived from them are too high. The official limits have to be critically reviewed and adapted. The remarkable peaks which occur when nuclear fuel is exchanged, should be reviewed and published separately so that they are no longer levelled and averaged. (8)

Cancer and leukaemia normally occur rarely in children.

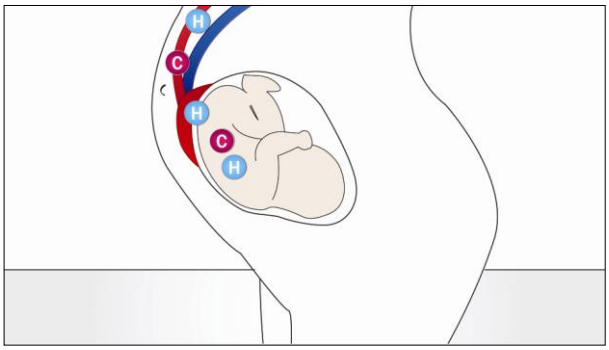


It is likely that the excess cancers of children living near nuclear facilities are established already during the embryonic stage.The embryo is extremely radiosensitive. The cells proliferate rapidly, and during mitosis, the cells are much more vulnerable than in stationary phases. Apart of that, the ability to identify and to eliminate "damaged" cells evolves later in childhood. An embryo has not yet these repair mechanisms. Damaged cells can therefore proliferate easily and hence pave the way for cancer and other diseases.

NPPs emit constantly radioactive isotopes into the environment but intensity changes.

The radionuclides may be incorporated via respiration, water, and food. Most common are tritium (H-3, heavy hydrogen), radiocarbon (C-14), strontium (Sr-90), Iodine (I-131), and plutonium (Pu-239). In a pregnant woman these incorporated isotopes are transported by the bloodstream and the placenta into the embryo and damage it (8).

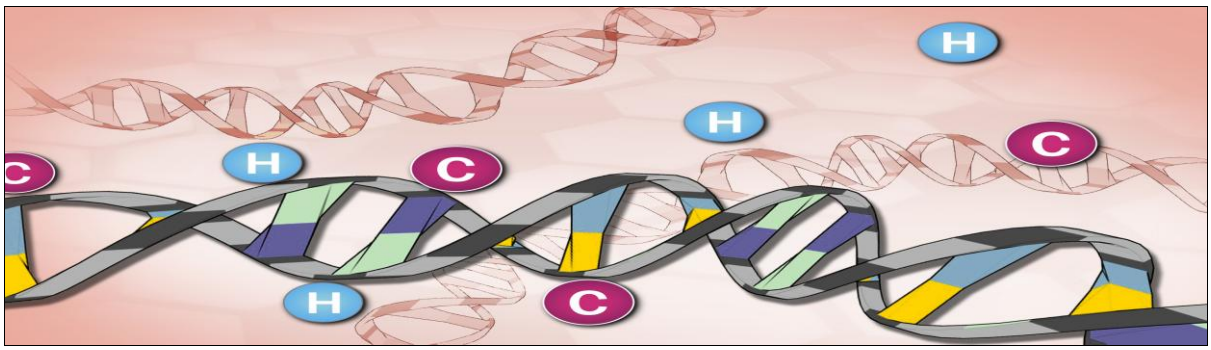
The biological effects of incorporated isotopes are widely underestimated.



For example tritium being a source of severe danger is usually played down by the radiation protection authorities. Tritium is an emitter of beta particles with a physical half life period of 12,3 years. So, after a period of 12,3 years, only half of a given amount of tritium is decayed under constant emission of beta particles. Compounding with oxygen, tritium easily changes to heavy water (HTO). Plants, animals and humans cannot make out the difference between HTO and normal water, H2O. HTO therefore is easily built into the structures of the cells, even into the DNA (9, 10). Similar pathways exist for other isotopes, for example strontium (mistaken for calcium), iodine and plutonium. The presence of the isotopes in the body changes due to biological half life periods.

The obsolete models and assumptions of the existing radiation protection should be reviewed.

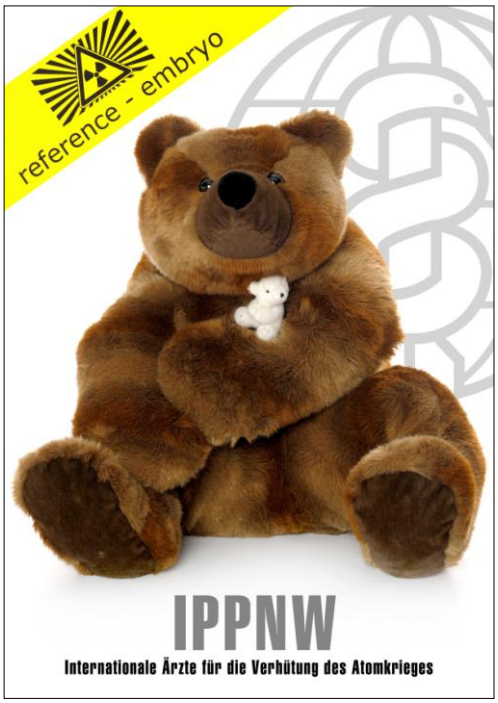
Emissions of radioactivity into the environment are subject to the official limits which are based on a calculation model referring to a "reference man". The assumptions for this "reference man" ground on obsolete data collected by the Japanese Radiation Effects Research Foundation (RERF) from Hiroshima and Nagasaki survivors 65 years ago. The validity of these data should be relativised. It is known today that the cancer rates after the nuclear bombings were much higher than it was assumed back then. But these obsolete data are applied until today and are assumed to be the only reference to "estimate" the effects of ionizing radiation "scientifically". Some more former errors are described in the recently published papers by IPPNW concerning the long-term health effects of the Hiroshima and Nagasaki bombs (11, 12). Nevertheless, the Japanese data are still the base of the dose-effect diagrams and threshold values estimated by the International Commission on Radiation Protection (ICRP). They are valid until today, though it is generally accepted that every tiny dose can lead to cancer and leukaemia in humans and mammals. Aside from this, the Hiroshima effects were caused by short acting ultrahigh-energetic external gamma rays, which are not at all comparable to the constant low-level radiation which is mostly internal alpha and beta particle radiation after incorporation of ionising nuclides.



The low-level radiation -and not "coincidence"- remains the only plausible explanation of the increased cancer rates.

Scientists of the KKR and the SSK, however, don´t accept radiation as the only reasonable parameter - because they think the radiation was too low by a factor of 1000. Being asked what else might be the cause, in the absence of arguments they tend to respond "possibly chance" or "coincidence". But taking into account all the facts mentioned such as the high radiosensitivity of the embryo, the uncertainties of the official limits, and the emission peaks during fuel exchange, the "factor 1000" is "melting". This factor does its job only to protect the obsolete measurement charts, official policies and the ongoing operation of nuclear power plants - but not the people.

What we need is a "reference embryo" to replace the "reference man".



In 1974, the ICRP created the "reference man", a hypothetical construct of a young, healthy white man in North America or Europe, aged 25-30, weighting 154 pounds, 5 feet 7 inches high. This is the base for the existing radiation protection. It is assumed that his immune system is in full working order and his cell repair mechanisms work well. These assumptions don't do justice to the situation of our children born in the vicinity of nuclear power plants. (13)

In the IPPNW-Petition for an advanced radiation protection (July 2009),

we ask the German Bundestag to replace the obsolete "reference man" by the more sensitive "reference embryo". Until August 2010, 4100 people joined this petition. The German Bundestag did not yet respond to our claims.

You can still sign the petition on the web, www.ippnw.de .

Reinhold Thiel

English-Translation from Malte Andre and Winfrid Eisenberg

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