



6930 Carroll Ave. #400
Takoma Park, MD 20912

Studies of radiation damage

Studies of background radiation (including natural and man-made)

- All childhood cancers¹ start to increase² at exposures not much more than natural annual doses.
- Among childhood cancers, leukemia and central nervous system cancer risks³ predominate.
- There appears to be a strong impact⁴ of radioactive contamination on individual fitness in current and future generations, with potentially significant population-level consequences, even beyond the area contaminated with radioactive material.
- Radioactivity is also associated with negative, subclinical health impacts such as impaired⁵ neural development and lower I.Q.⁶
- Radiation can increase resistance⁷ of bacteria to antibiotics.
- Radioactivity appears to act along the estrogen pathway⁸, hinting that, in addition to a carcinogen, radioactivity may be an endocrine disruptor. Estrogen plays key roles in healthy pregnancy and puberty and is greater in women than men.

Uranium studies

- Uranium in drinking water—at levels allowed by the Environmental Protection Agency—disrupts⁹ the estrogen pathway.
- Birth defects¹⁰ and abnormal¹¹ pregnancy development, including low birth weight, are associated with ingestion of uranium.
- The incidence¹² of reproductive or gonadal cancer in New Mexico Native American children and teenagers is 8-fold greater than that in non-Native Americans of the same ages. New Mexico has been home to hundreds of uranium mines, all of which are now abandoned (although threats of new mines remain). These mines have left behind tailings and other radioactive wastes that have contaminated soil, air and water and which continue to harm health.

Operating reactor/fuel facility studies

- The National Academy of Sciences says childhood leukemia is a sentinel indicator¹³ for radiation exposure in a community.
- When data around normally operating nuclear facilities is examined worldwide, we find increases¹⁴ in childhood leukemia. Over 60 studies indicate this.

Catastrophe studies¹⁵

- Children in Chernobyl-contaminated areas have suffered reduced respiratory¹⁶ capacity as recently as 2010. The more radioactive cesium in their body, the greater the effect.



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- Exposure to radioactivity is associated with chronic fatigue immune dysfunction syndrome (CFIDS¹⁷)
- Cardiovascular defects¹⁸ are still surfacing from radioactivity due to the ongoing Chernobyl catastrophe.
- Birth defects (blastopathies¹⁹) and other health disturbances are found among not only those who were adults at the time of the Chernobyl disaster, but their children who were in utero at the time and, most disturbingly, their later offspring.
- Thyroid cancers in the TMI area appear to bear a radiation-specific biological marker²⁰, occur earlier and seem to be more aggressive.²¹ Thyroid cancers continued increasing²² years after Chernobyl began. Thyroid cancers have been observed in children since the Fukushima nuclear disaster in Japan but studies²³ at Fukushima suffer from poor methodology and lack of transparency, putting in serious jeopardy any independent analysis.
- Research²⁴ indicates that forest matter in the contaminated areas around Chernobyl is taking years or even decades longer to decay²⁵ than it should.
- Monkeys in Fukushima-contaminated areas²⁶ are born with fewer blood components, including white blood cells, now that their environment is radioactively contaminated from the reactor explosions of 2011. Having a diminished number of white blood cells, which fight disease, can lead to a compromised²⁷ immune system.
- Negative impacts²⁸ on animals such as smaller brains and lower sperm counts, to name just two, are also occurring at Chernobyl and Fukushima.

¹ Background Radiation & Cancer in Children. Video
https://www.youtube.com/watch?annotation_id=annotation_3426295427&feature=iv&src_vid=5xYRvnCBZOM&v=XTijlRsXTSE

² A record-based case-control study of natural background radiation and the incidence of childhood leukaemia and other cancers in Great Britain during 1980–2006. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3998763/>

³ Background Ionizing Radiation and the Risk of Childhood Cancer: A Census-Based Nationwide Cohort Study
<https://ehp.niehs.nih.gov/1408548/>

⁴ Strong effects of ionizing radiation from Chernobyl on mutation rates. <https://www.nature.com/articles/srep08363>

⁵ CHERNOBYL'S SUBCLINICAL LEGACY: PRENATAL EXPOSURE TO RADIOACTIVE FALLOUT AND SCHOOL OUTCOMES IN SWEDEN. <http://www.columbia.edu/~le93/Chernobyl.pdf>

⁶ The Chernobyl accident and cognitive functioning: a study of Norwegian adolescents exposed in utero.
<http://www.ncbi.nlm.nih.gov/pubmed/21038158>

⁷ Sensitivity to Antibiotics of Bacteria Exposed to Gamma Radiation Emitted from Hot Soils of the High Background Radiation Areas of Ramsar, Northern Iran. <http://www.theijoem.com/ijoem/index.php/ijoem/article/view/958>

⁸ Interaction between ionizing radiation and estrogen: What we are missing? [http://www.medical-hypotheses.com/article/S0306-9877\(11\)00413-0/abstract](http://www.medical-hypotheses.com/article/S0306-9877(11)00413-0/abstract)



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- ⁹ On Cancer's Trail <http://www2.nau.edu/gradcol/enews/2008September/Research.html>
- ¹⁰ On Cancer's Trail <http://www2.nau.edu/gradcol/enews/2008September/Research.html>
- ¹¹ Embryo Toxic Effects of Depleted Uranium on the Morphology of the Mouse Fetus. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3985252/>
- ¹² On Cancer's Trail <http://www2.nau.edu/gradcol/enews/2008September/Research.html>
- ¹³ Analysis of Cancer risks in Populations Near Nuclear Facilities Phase I. 2012. P 190. http://www.nap.edu/catalog.php?record_id=13388
- ¹⁴ Hypothesis to explain childhood cancer near nuclear power plants. <https://www.ncbi.nlm.nih.gov/pubmed/20662426>
- ¹⁵ For a comprehensive assessment of Chernobyl impacts, see The Other Report on Chernobyl (TORCH) An independent evaluation of the health-related effects of the Chernobyl nuclear disaster. March 31, 2016. Ian Fairlie. For Chernobyl studies previously unavailable in the West, see: Chernobyl: Consequences of the Catastrophe for People and the Environment. Yablokov and Nesterenko. 2009.
- ¹⁶ Reduced lung function in children associated with cesium-137 body burden. <https://www.ncbi.nlm.nih.gov/pubmed/26072943>
- ¹⁷ National CFIDS Foundation — Ionizing Radiation and CFIDS/ME. Medical Research Papers and Highlights <http://www.ncf-net.org/radiation.htm>
- ¹⁸ Exiled scientist: 'Chernobyl is not finished, it has only just begun' <https://www.usatoday.com/story/news/world/2016/04/17/nuclear-exile-chernobyl-30th-anniversary/82896510/>
- ¹⁹ Impacts of disaster-related radiation exposure on child development. <https://vimeo.com/210658909>
- ²⁰ http://www.pennlive.com/news/2017/05/hershey_researcher_believes_ne.html
- ²¹ <http://nuclearhotseat.com/2018/04/11/three-mile-island-nuclear-meltdown-at-39-wtf-actually-happened-to-us-nh-355/>
- ²² <https://www.mskcc.org/blog/study-reveals-genetic-causes-thyroid-increase-after-chernobyl>
- ²³ Fukushima Thyroid Examination Fact Sheet: September 2017 https://www.iwanami.co.jp/kagaku/eKagaku_201709_Hiranuma-rev.pdf
- ²⁴ Highly reduced mass loss rates and increased litter layer in radioactively contaminated areas. <http://www.ncbi.nlm.nih.gov/pubmed/24590204>
- ²⁵ Decay takes a holiday: the wickedness beneath the "Chernobyl wild paradise" myth and the rotten implications for ecosystems and radiation science <http://www.beyondnuclear.org/russia-ussr/2014/4/18/decay-takes-a-holiday-the-wickedness-beneath-the-chernobyl-w.html>
- ²⁶ Three Ways Radiation Has Changed The Monkeys Of Fukushima <https://www.forbes.com/sites/jeffmcMahon/2017/10/30/three-ways-radiation-has-changed-the-monkeys-of-fukushima-a-warning-for-humans/>
- ²⁷ Low white blood cell count <https://www.mayoclinic.org/symptoms/low-white-blood-cell-count/basics/when-to-see-doctor/sym-20050615>
- ²⁸ Anomalies in wildlife and the ecosystem around Chernobyl and Fukushima. <https://vimeo.com/211662517>