

Gender Matters in the Atomic Age

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United Nations

Mary Olson

Nuclear Information & Resource
Service

www.nirs.org

maryo@nirs.org

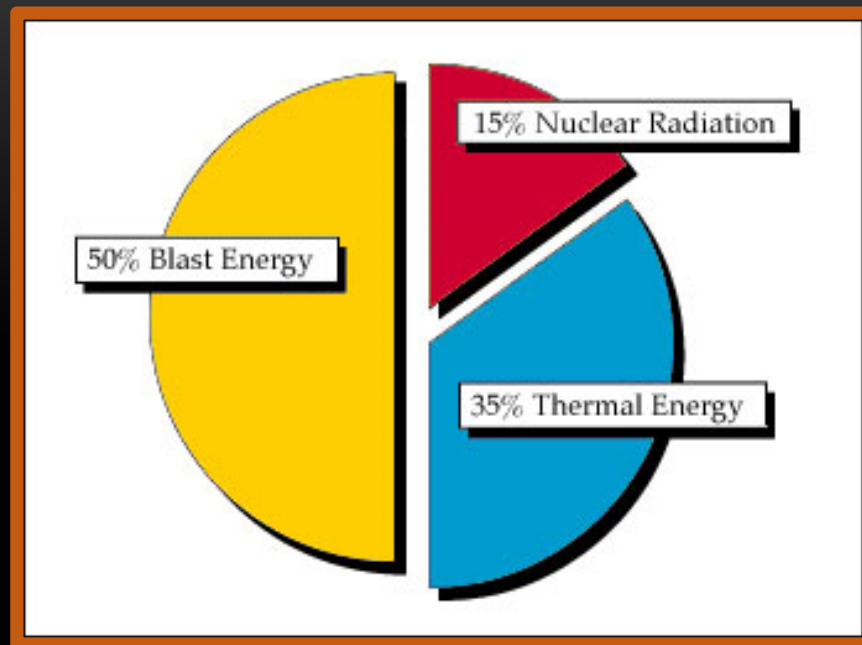
Slides Web Posted

<http://tinyurl.com/Radiation-UN-2015>

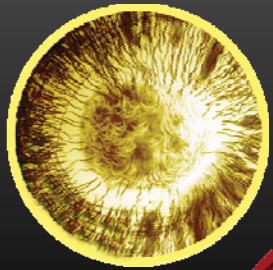
Original Art by **Loren Olson**



The energy profile of a nuclear explosion:



Icons used in this paper:



Blast / Shock



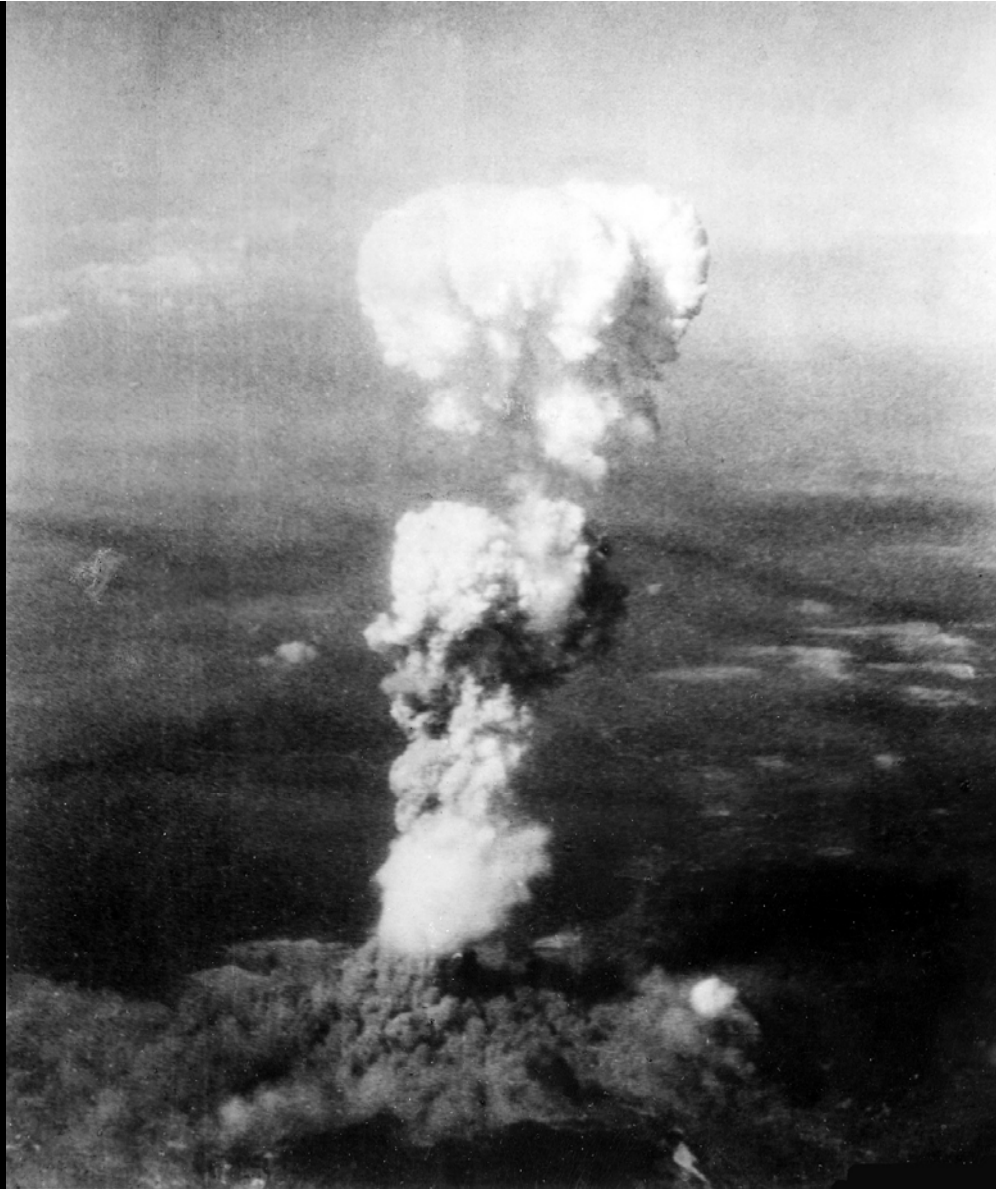
Fireball / Thermal

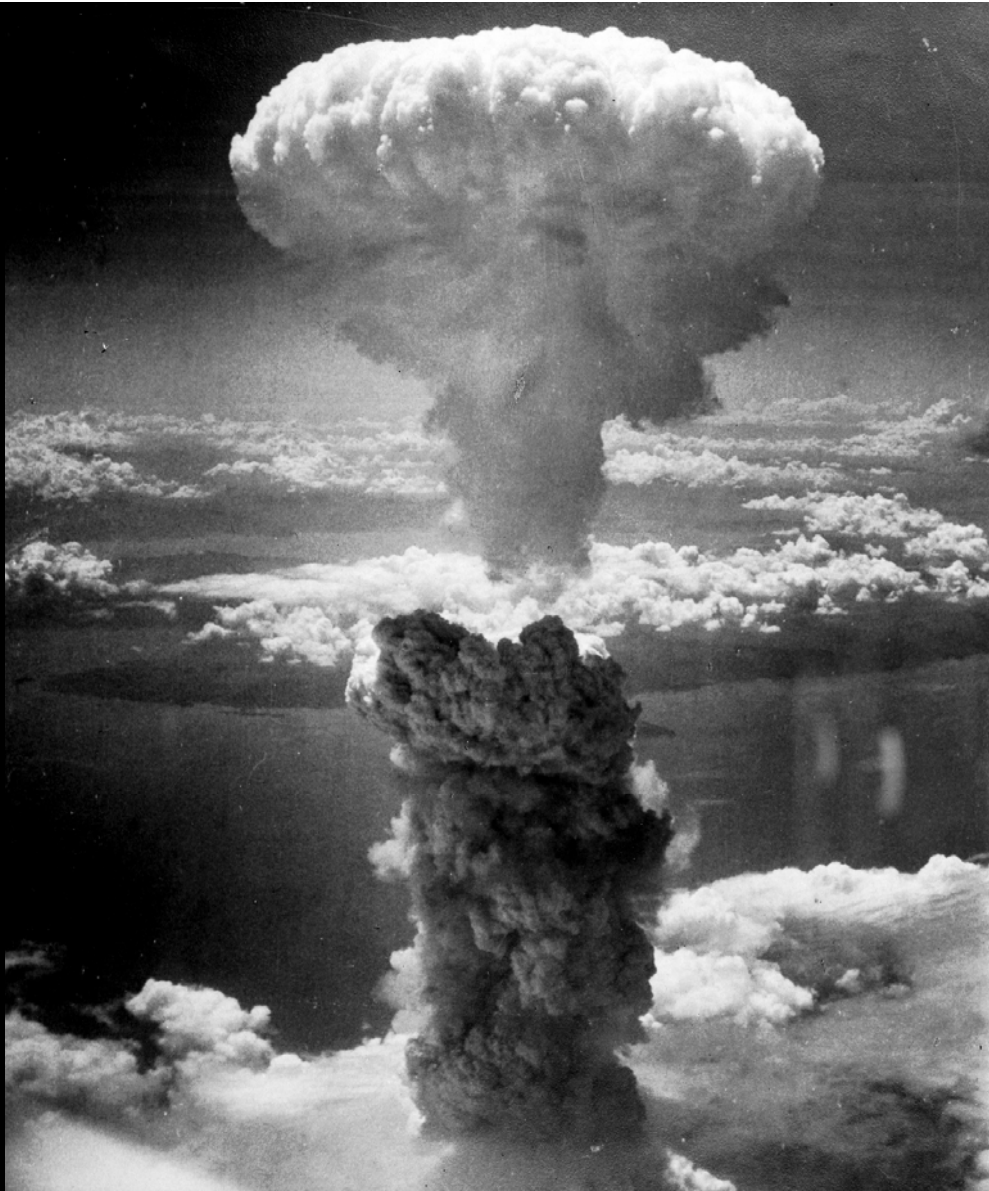


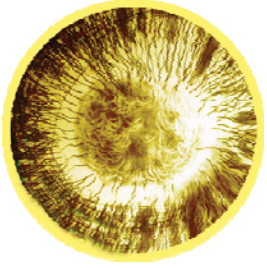
Immediate Gamma / Neutron Radiation



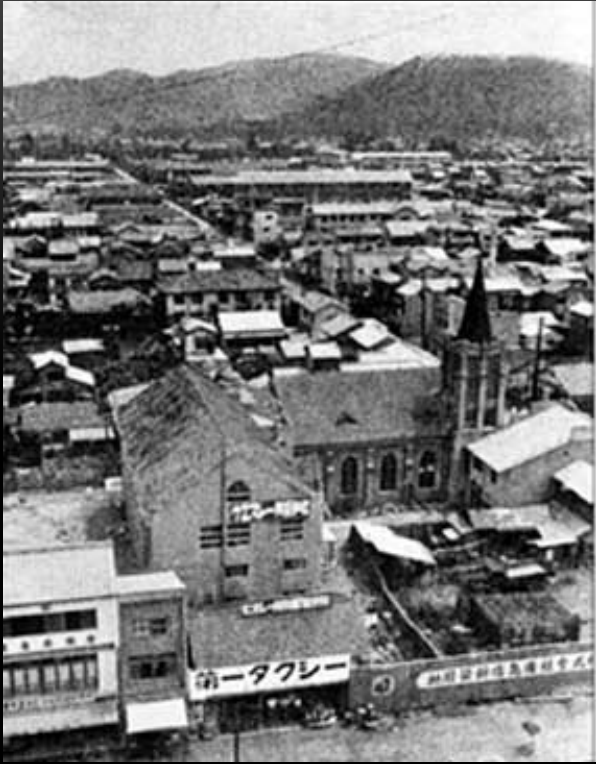
Fall-Out / Persistent Radioactivity







Nagasaki, 1945





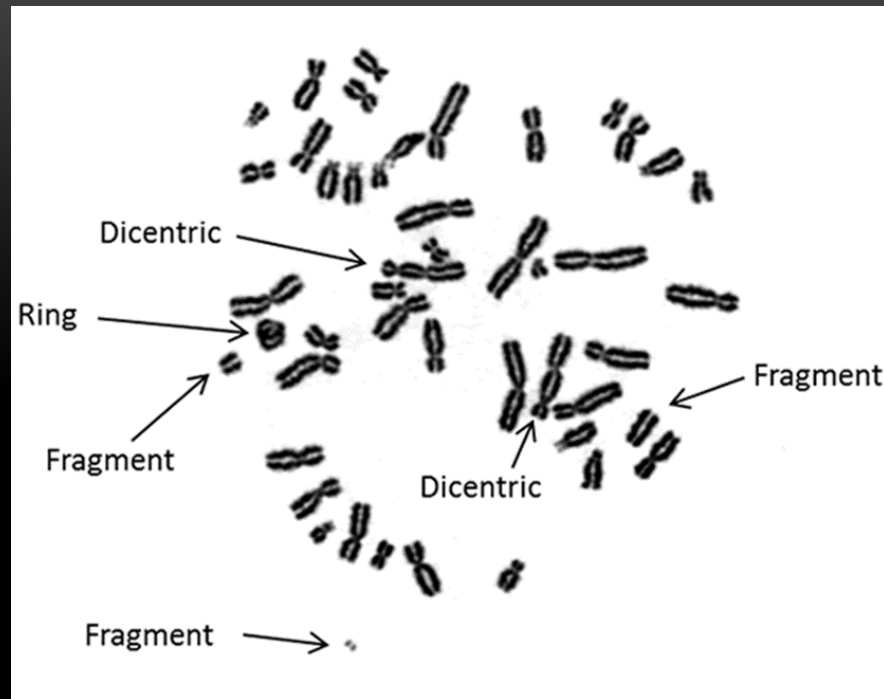
Immediate Fatalities

City	Estimated Population at the time of the bombing	Estimated number of acute deaths (with 2 – 4 months)
Hiroshima	340,000 – 350,000	90,000—166,000
Nagasaki	250,000—270,000	60,000—80,000

Source: Radiation Effects Research Foundation



Radiation Induced Chromosomal Aberrations, as seen with microscope





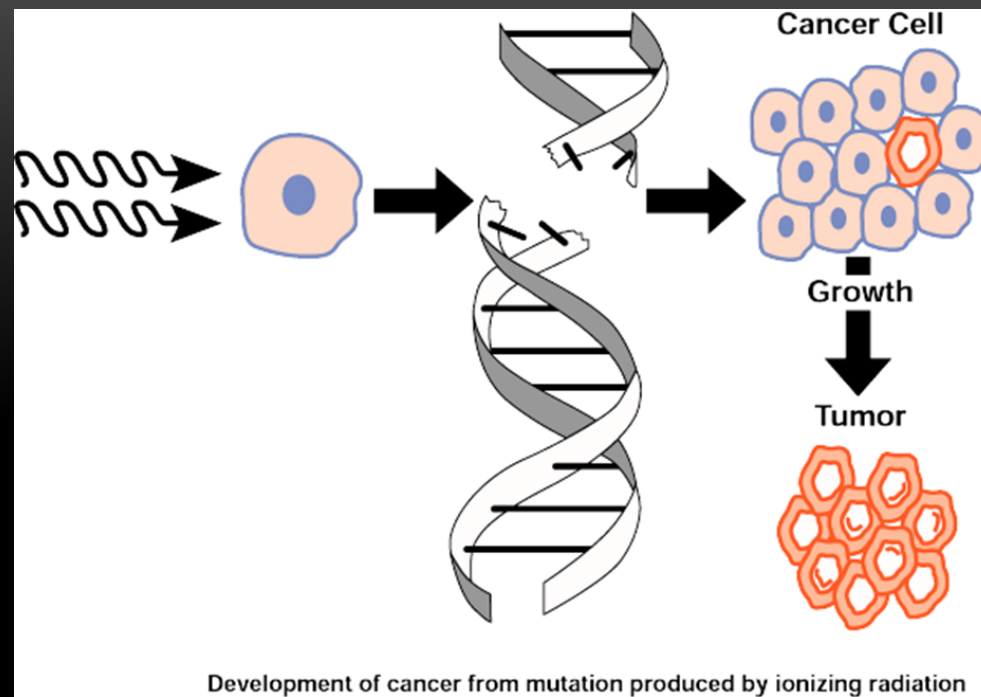
Radiation is more harmful to children



Children Between Birth and 5 Years



Medical Impacts of Ionizing Radiation: Cancer



Ionizing radiation harms our cells.



Ionizing Radiation: No Safe Dose



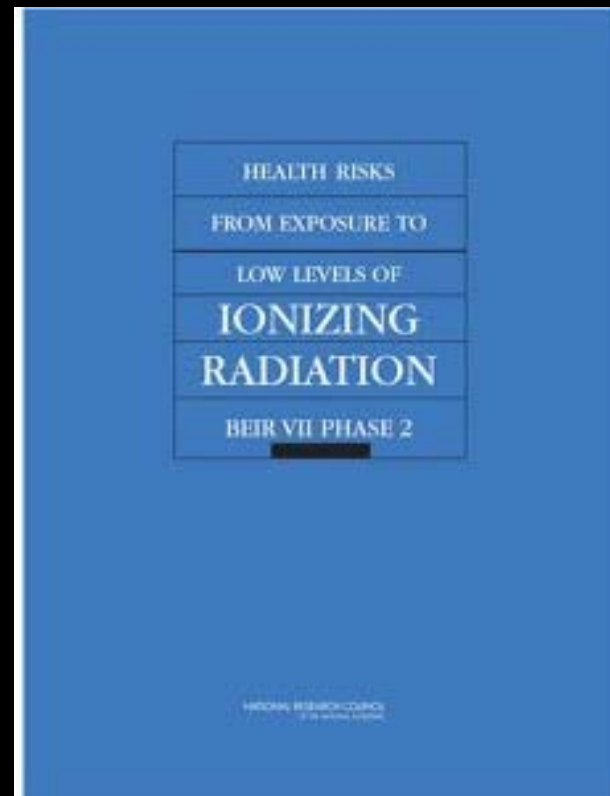
- Regulatory agencies acknowledge:

There is no “safe” dose of ionizing radiation.

Radiation is not safe for males, new findings show that ionizing radiation is more harmful for females:

Gender is a factor.





U.S. National Academy of Science:
Biological Effects of Ionizing Radiation (BEIR VII Phase 2)
published 2006.



Lifetime Risk of Cancer Incidence (acute exposure between birth and age five)



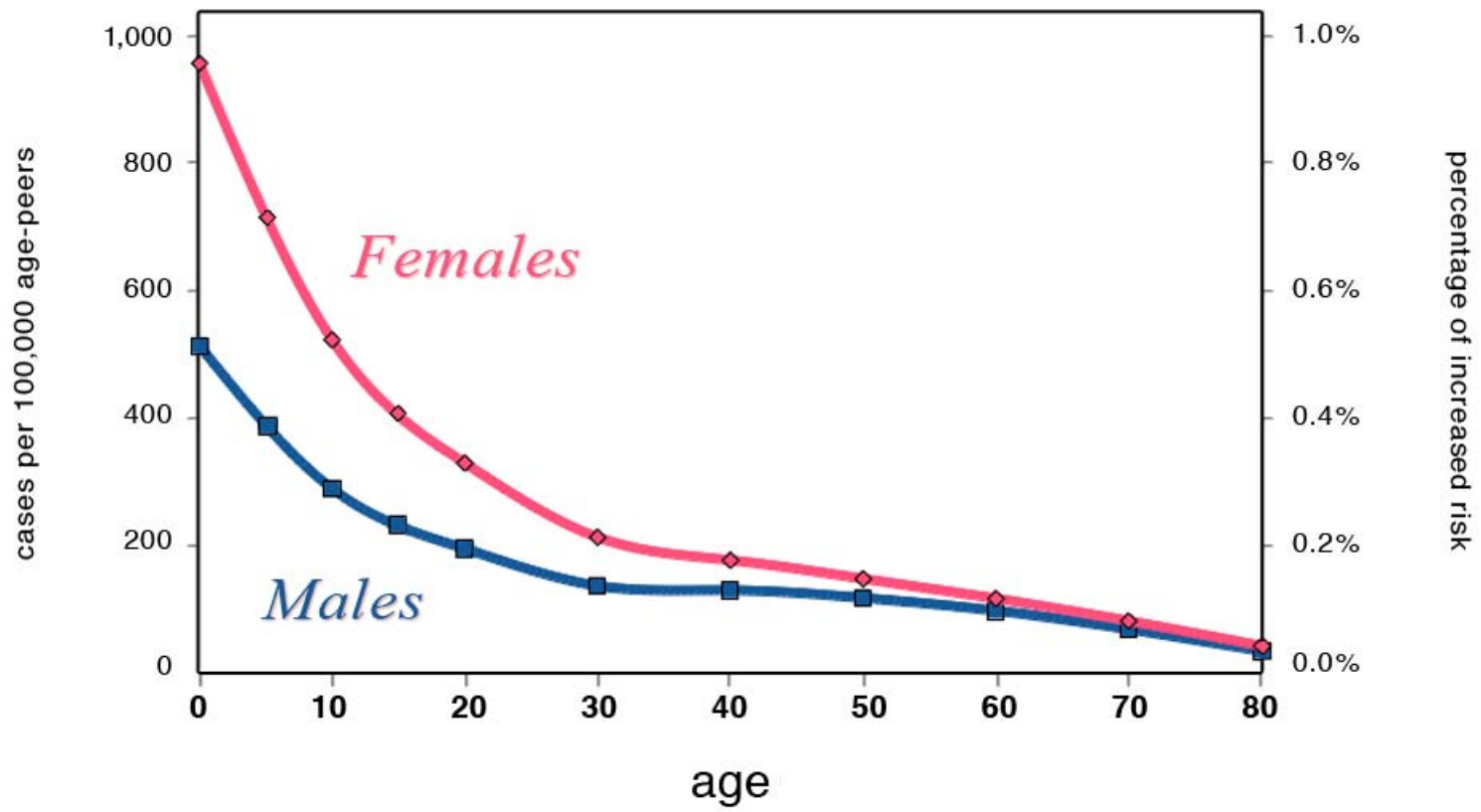
2 Boys



4 Girls



Increased Cancer Risk by Age at Exposure to 20 mSv Radiation

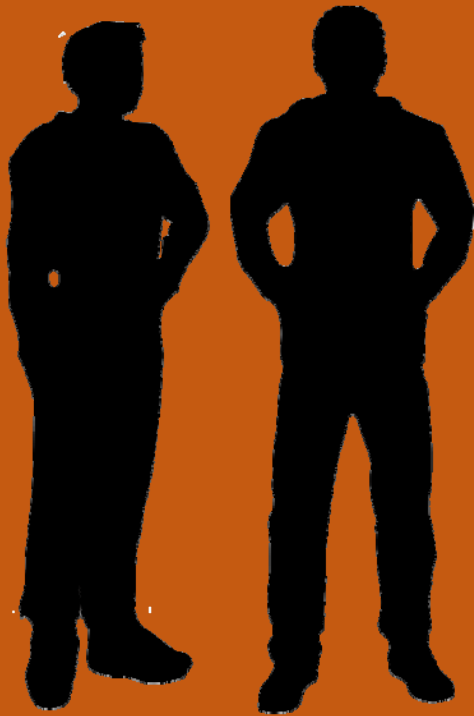


Data points from: U.S. National Academy of Sciences BEIR VII Phase 2 Risk Model





Lifetime Cancer fatalities among those exposed to ionizing radiation as adults



2 Men



3 Women

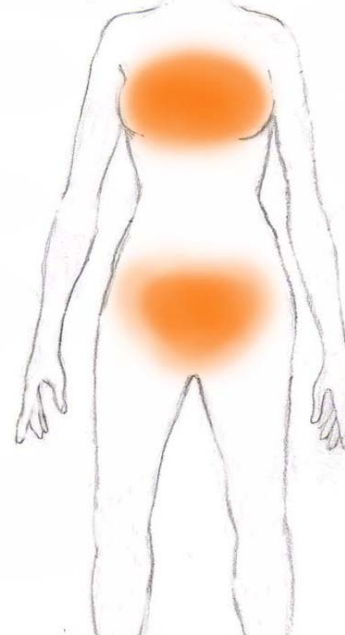


Why is Gender a risk-factor for more cancer?



Dr. Rosalie Bertell

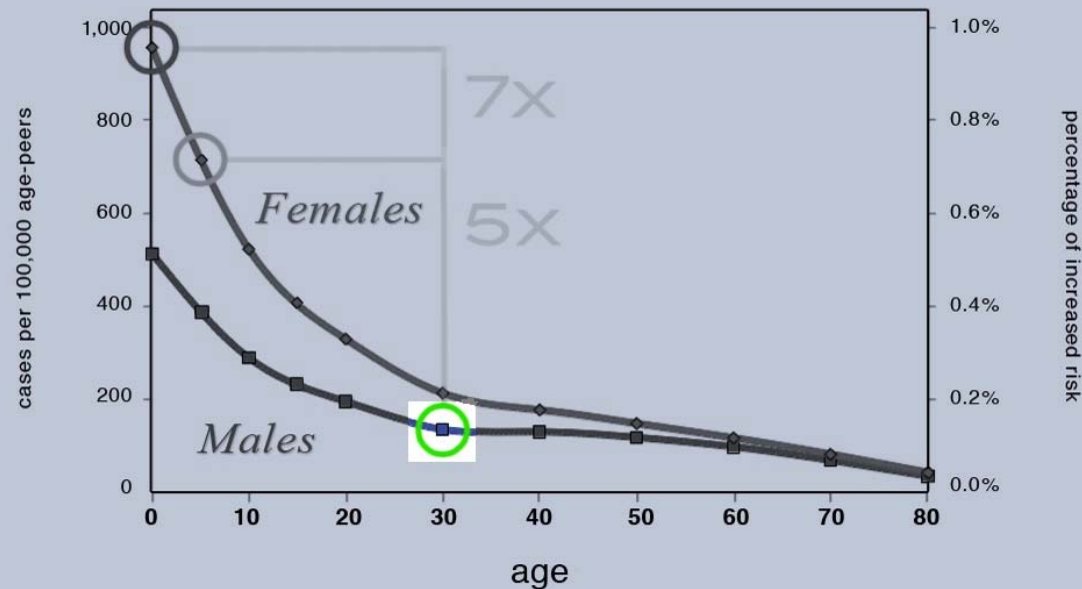
Females have 50% more
high-risk tissue
compared to males





Green circle = VISIBLE in radiation policy decisions
Gray = INVISIBLE

Increased Cancer Risk by Age at Exposure to 20 mSv Radiation



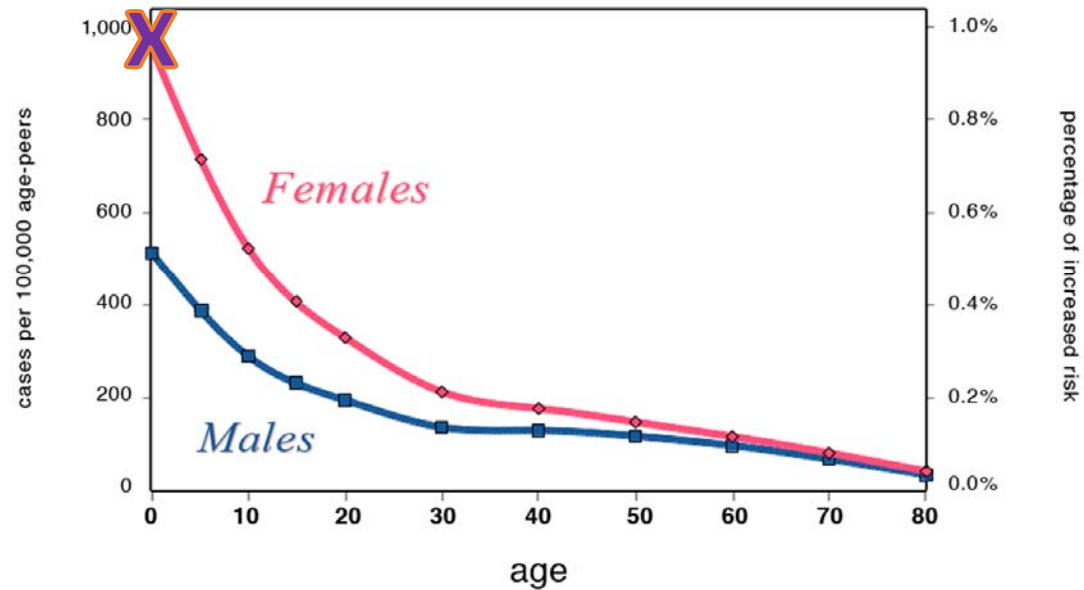
Data points from:

U.S. National Academy of Sciences BEIR VII Phase 2 Risk Model

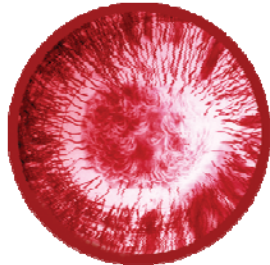


Responsible radiation regulation: Life Cycle Protection

Increased Cancer Risk by Age at Exposure to 20 mSv Radiation



Data points from: U.S. National Academy of Sciences BEIR VII Phase 2 Risk Model



Hiroshima and Nagasaki are unique;
not conservative



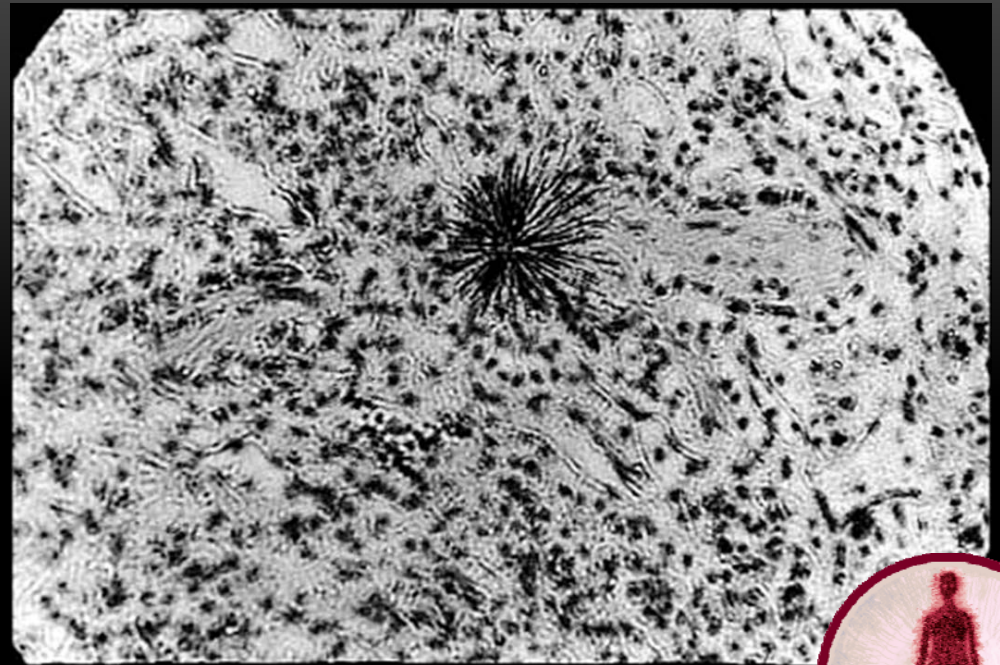
- Deaths that came after the blasts, between 1945 and 1950 not included in data;
- Survivors studied 1950 -- 2005 are STRONGER group than any “general population”



A-Bombs: One fast pulse of **external** ionizing radiation – like an X-ray



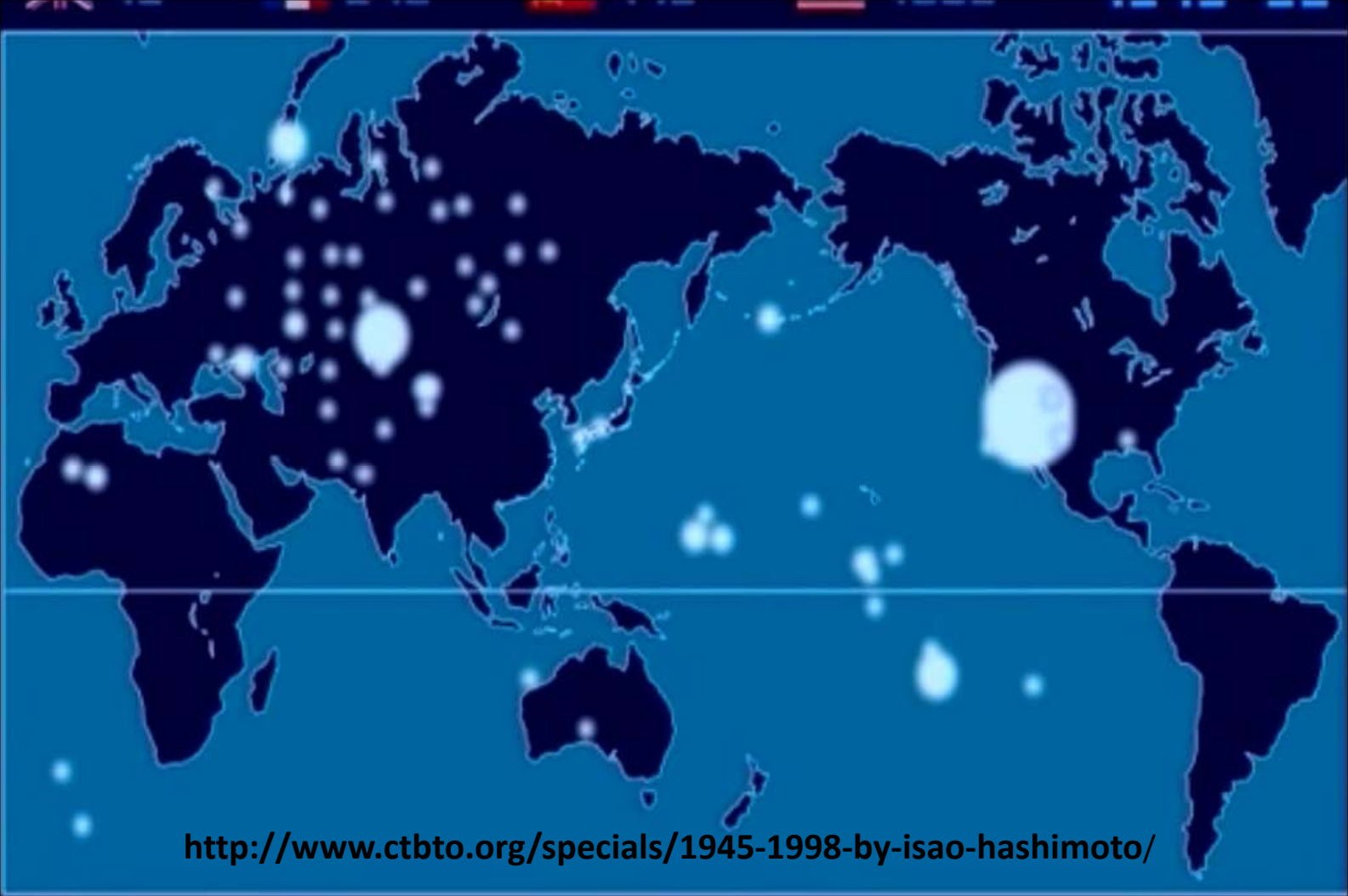
Medical X-Ray image



Plutonium particle in lung tissue



"1945-1998" by ISAO HASHIMOTO

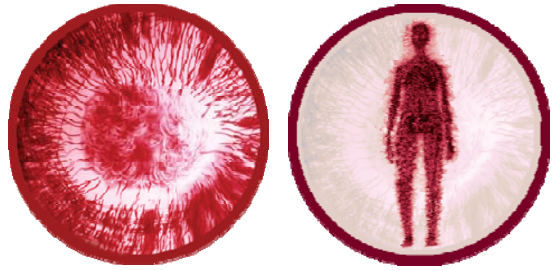


<http://www.ctbto.org/specials/1945-1998-by-isao-hashimoto/>

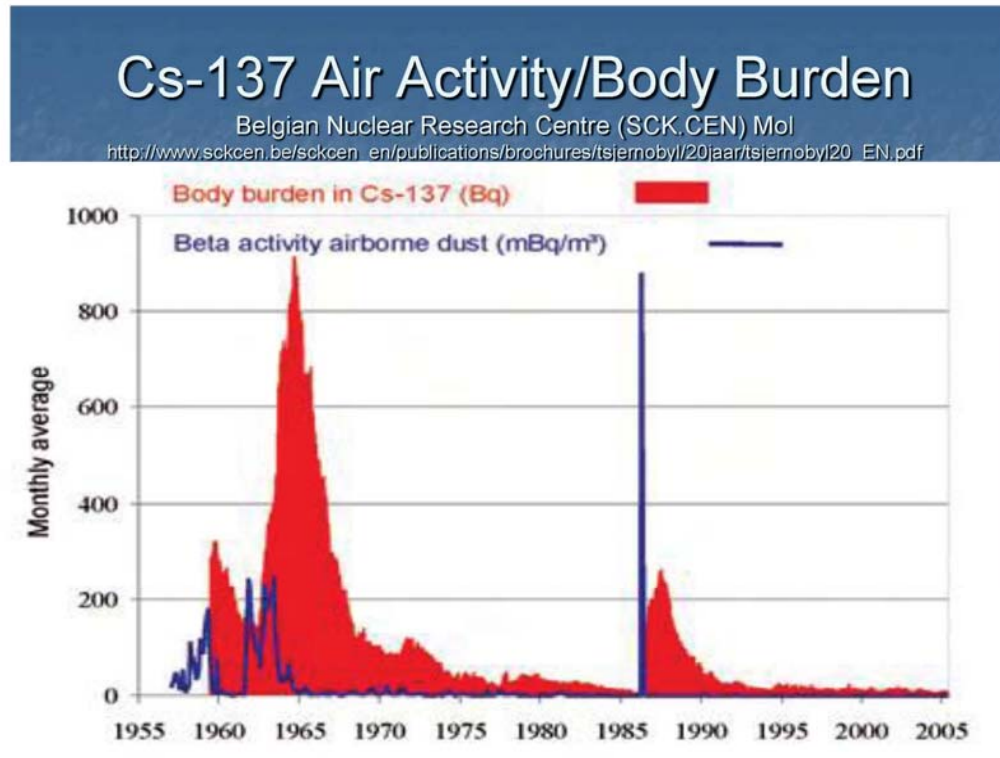


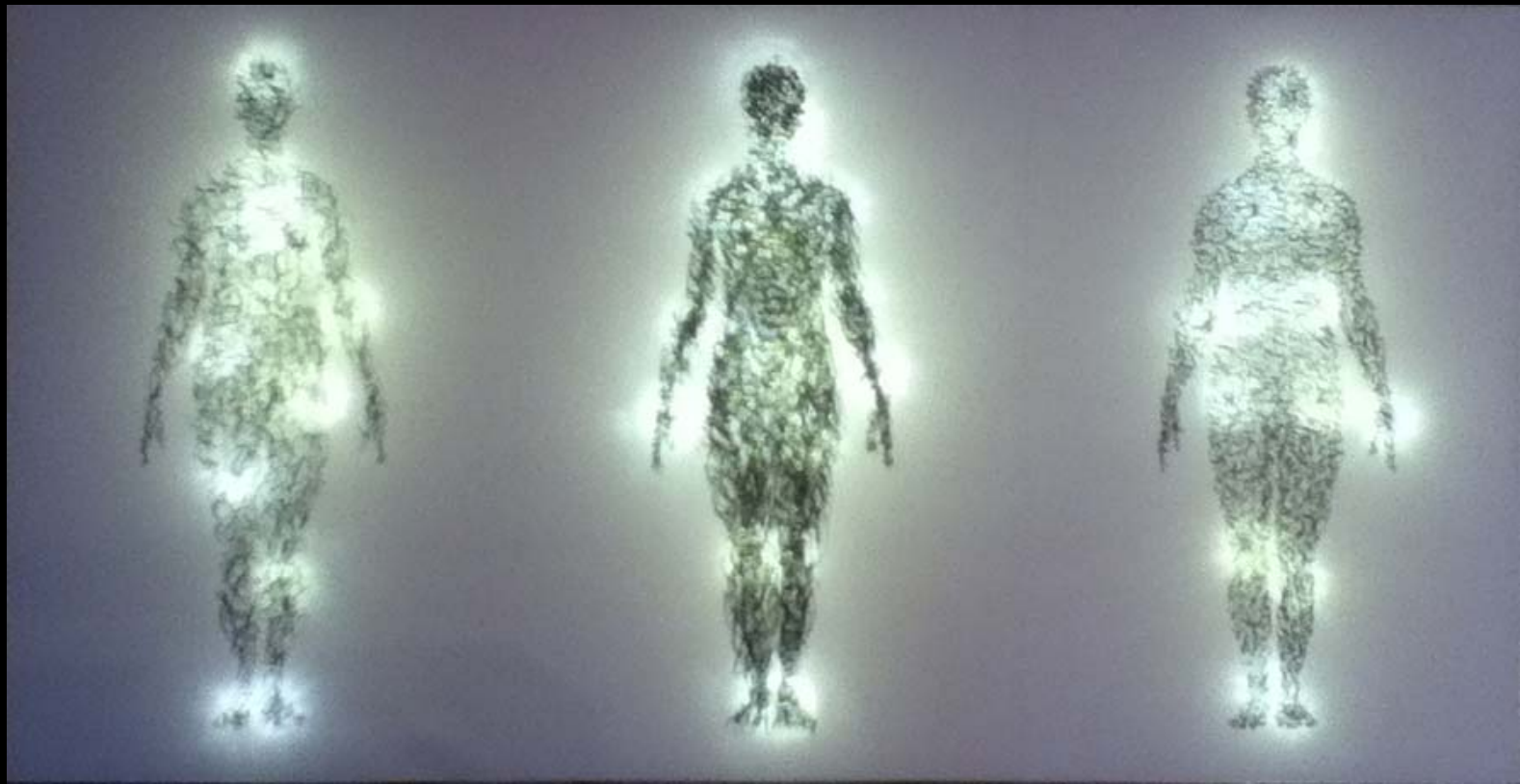
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Radioactivity in flesh: Atmospheric Weapons Detonations + Chernobyl





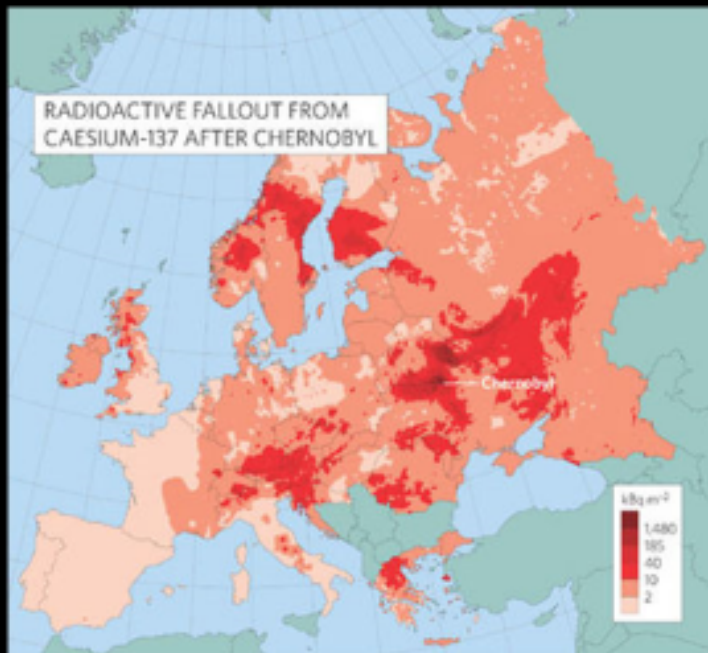


Fission: Nuclear Power Stations 390 “Operable” Worldwide

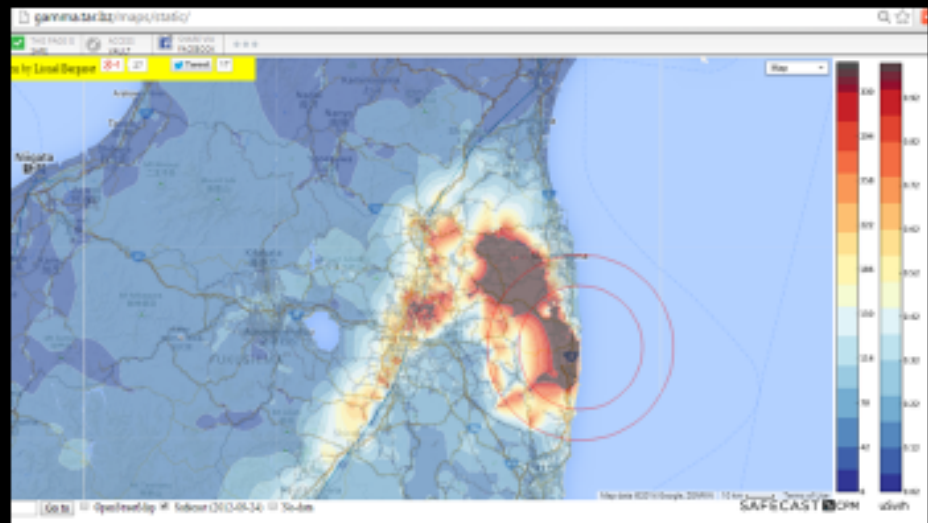




Environmental Contamination: Chernobyl and Fukushima



40% of Europe contaminated above 4,000 Bq / m²
by Chernobyl reactor explosion in 1986



Gamma levels in proximity to Fukushima Daiichi, map
constructed by Lionel Bergeret from SAFECAST data



Radiation Exposure in Pregnancy: Three Generations





Dr Alice Stewart: “Childhood cancer is a post-birth defect.”



Ionizing Radiation: Non-Cancer Medical Impacts







