

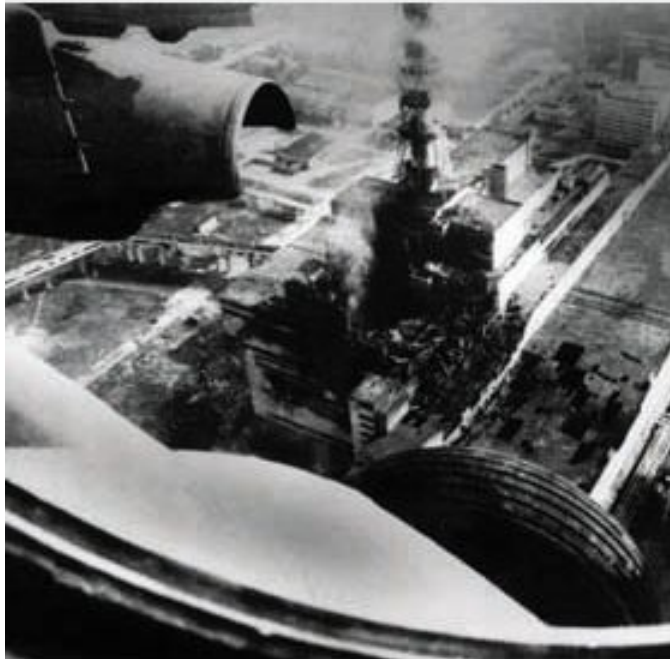


Timebomb Nuclear Energy 20 years of Chernobyl

An IPPNW Presentation



What really happened – the meltdown



The smoking reactor
Chernobyl Interinform



The exploded reactor
Igor Kostin (taken 12 hours after the catastrophe)



What really happened – the meltdown

- **26th of April, 1986**

01:23:00: Start of an experiment in Block IV of the plant

01:23:40: The emergency shutdown fails

01:23:48: The reactor explodes, emitting radioactivity

- **28th of April, 1986**

21:00:00: The Soviet news TASS first reports the accident

- **29th of April, 1986:**

Western news first report of the meltdown



What really happened – measures taken

- After 36 hours:
Evacuation of 45,000 people from the city of Pripjat
- Until May 5th:
Evacuation of 130,000 people from within 30 km of ground zero
- May 1st, 1986:
The state begins the control of water and milk
- 23. Mai 1986:
Iodine tablets start to be disseminated



What really happened – measures taken

- The plants' fire brigades try to control the flames
- 600,000 – 860,000 young men (so called liquidators) are drafted to clean up the wreckage
- Until May 5th: 4,200 tons of lead and sand are dropped on the nuclear reactor
- May 6th: The fire is finally brought under control



Two men clean a vehicle

Source: Chernobyl Interinform



What really happened – the so called death zone



Evacuated
Kindergarten in Pripjat



What really happened – the so called death zone



Soldier guarding the death zone



What really happened – the so called death zone



In the death zone



What really happened – the so called death zone



Evacuated building



What really happened – radioactive pollution

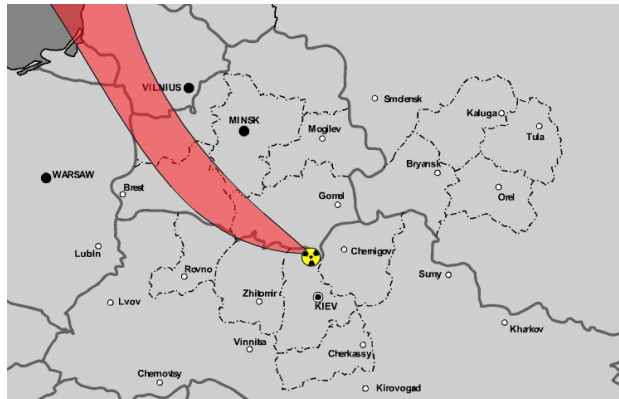


- **Death Zone:**
30-Kilometer-radius around the reactor
- **Contaminated regions:**
Belarus: 30 percent
Ukraine: 7 percent
European Russia: 1,6 percent
Total of 162,000 km² are contaminated
- **Nine million people** are affected. 400,000 loose their houses and properties

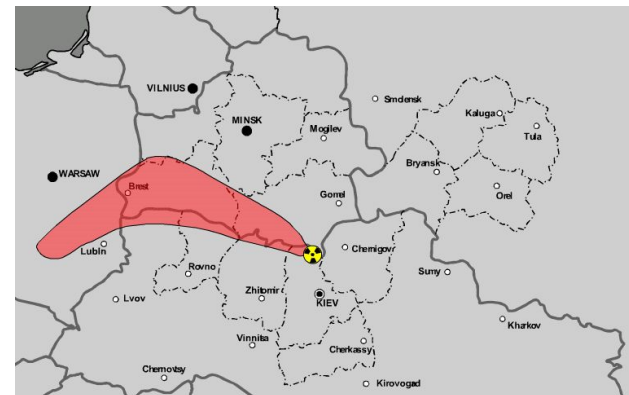


What really happened – radioactive pollution

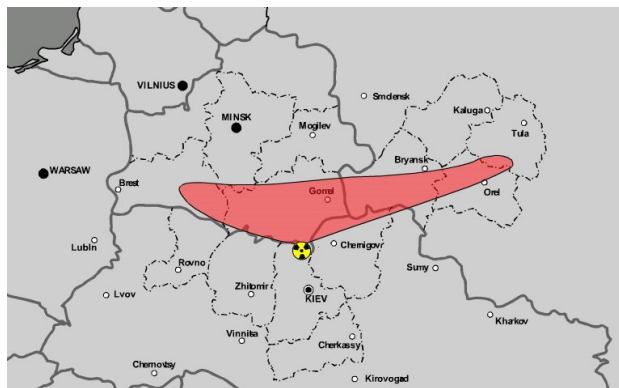
- Changing wind patterns spread the radioactive cloud all over Europe
- Scandinavia, the Baltic States, Poland, Germany, Switzerland, Austria, Italy and other regions were contaminated as well



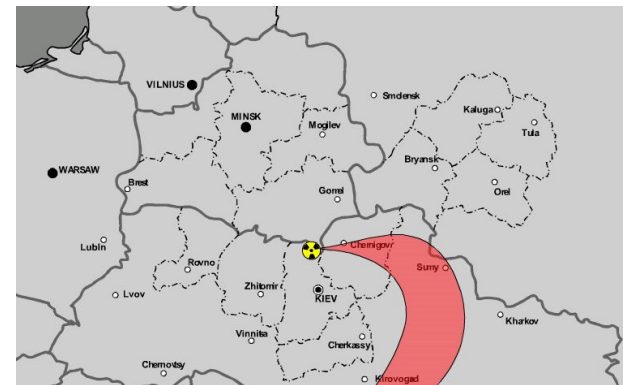
April 26th, 00.00



April 27th, 00.00



April 27th, 12.00



April 29th, 00.00

Source:
UNESCEAR Report,
New York 2000;
Annex J.



What really happened - Evacuation



A Belarus couple that had to be evacuated from their irradiated village to a housing complex in Minsk.

Photo: Martina Buchholz



Health effects of radioactivity

Radioactive elements dispersed by Chernobyl

Iodine 131	→	Halftime: 8 days ; stored in the thyroid gland, causes thyroid cancer
Cesium 137	→	Halftime: 30 years ; stored in all organs, causes cancer, enters the food chain
Strontium 90	→	Halftime: 28 years ; stored in teeth and bones, causes leukaemia
Plutonium 239	→	Halftime: 24.000 years ; contaminates water reservoirs, causes cancer



Health effects of radioactivity



Local farmer selling contaminated berries

Photo: Martina Buchholz



Health effects of radioactivity

- High dosis starting with 0.5 Sievert (Sv)
 - Immediate breakdown of the immune system
 - Uncontrollable bleeding and anemia
 - Damage to the gastrointestinal tract
 - Damage to internal organs and the central nervous system
 - Tumors as long-term effects



Health effects of radioactivity

Low level radiation

- Each dose, no matter how small, can cause cancer
- The question is how often this occurs and if other diseases can also be attributed to it
- According to new studies, the effects of low-level radiation include:
 - Genome instabilities
 - Mutations of DNA
 - Malformations
 - Increased cell aging



Health effects – the dispute

Numbers of the IAEA

- Less than 50 deaths by mid-2005
- Approximately 4,000 cases of thyroid cancer with only 9 deaths and healing rates of 99% (with western standard medicine)
- No proof of a rise in malformations, sterility, leukaemia or other types of cancer attributed to the meltdown
- Up to 4,000 possible deaths due to the accident in Chernobyl
- The case of Chernobyl can be considered closed. Poverty, unhealthy living standards and the psychiatric impact of the fall of the Soviet Union far exceed the effects of radiation.

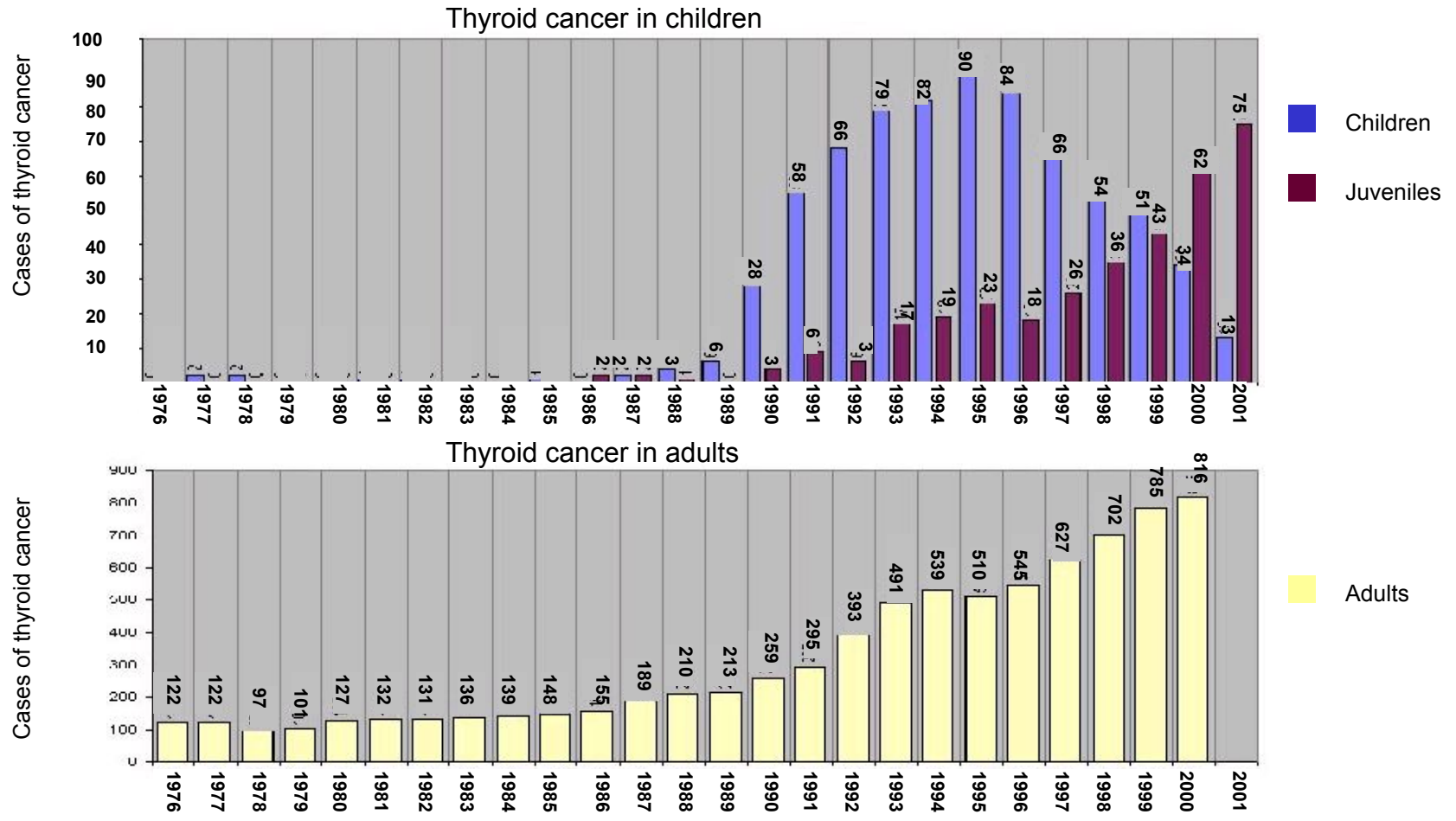
Source: Chernobyl-Forum-Report Sept. 2005

Statistics of official institutions

- 25.000 deaths amongst the 800,000 Liquidatoren (Source: state cancer registries in three states)
- 94 percent of liquidators are ill (Source: Ukrainian Embassy 2005)
- 84 percent of 3 million people exposed to radioactivity in Ukraine are ill (Source: Chernobyl Interinform)
- According to the Belarus cancer registry, the cancer rate has increased by 40% since Chernobyl
- A working group of the WHO calculated 50,000 cases of thyroid cancer within the next 30-50 years amongst children 0-4 years of age at the time of the accident



Health effects – Thyroid cancer



Source: Otto Hug Strahleninstitut 2002



Health effects – Thyroid cancer



Girl during an ultrasound examination (offered for free by German IPPNW doctor)



Health effects – cancer statistics

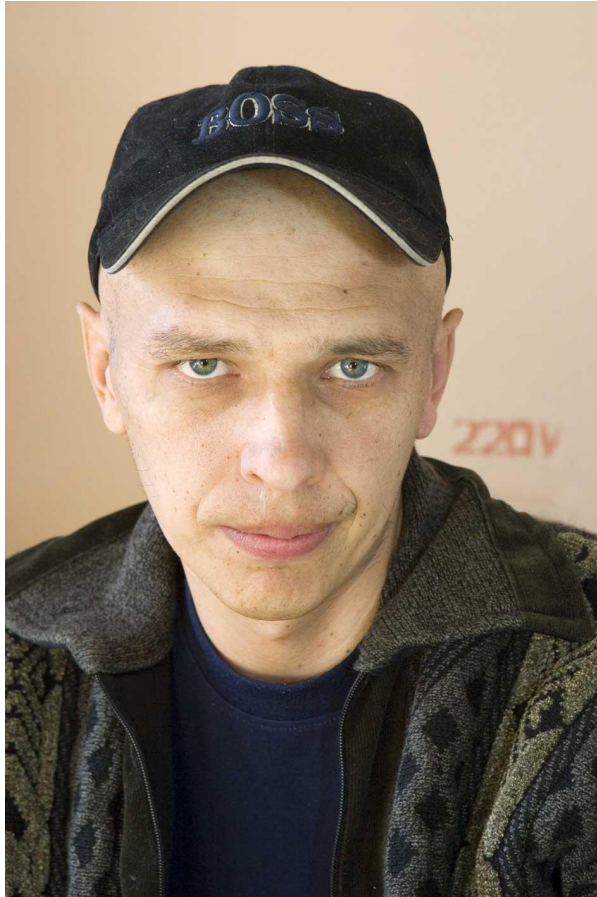
- Amongst liquidators: Rise in cancer rate by 20 %
- In the region of Gomel, Belarus: rise in cancer rate by 55,9 %
- In the regions of Gomel and Mogilev: Doubling of breast cancer rates, as well as a shift of 15 years towards younger women
- Rise of childhood leukaemia in the affected regions: 300%
- Rise of brain tumors amongst small children in Ukraine: 580%

Sources:

IPPNW & German Society for Radiation Protection



Health effects – cancer statistics



Michael Stankewitsch, 37 years of age

Operated for brain tumor

Photo: Rolf Schulten



Health effects on small children

- 5,000 additional deaths amongst small children in Europe
- Significant rise in malformations in several European countries
- At least 10,000 additional Malformations in Europe



Health effects – other diseases

Liquidators

- Increase in lethal cardio-vascular diseases by 22%
- Sharp rise in gastrointestinal and CNS-diseases
- 95% of liquidators suffer from ocular diseases
- Accelerated aging due to damage to antioxidant systems

Children

- 70% of children of affected parents are registered as chronically ill (Ukraine, 1996)
- 13x rise in childhood diseases in the region of Gomel



Health effects – the IPPNW study

Liquidators

Several 100.000 liquidators are affected
Several 10.000 Liquidatoren have died from radiation

Thyroid cancer

More than 10.000 cases of thyroid cancer in the normal population
More than 50.000 expected cases of thyroid cancer in the near future

Malformations

10,000 severe cases of malformations in Europe

Neonatal mortality

5,000 additional childhood deaths in Europe



Health effects – the IPPNW study

Cancer, leukaemia and other diseases

Rise in cancer and leukaemia cases in several states. No metanalysis to date.

13x rise in childhood manifestation of diseases in affected regions

Genetische Schäden

Bei Kindern von Liquidatoren und Menschen in belasteten Gebieten wurden Erbgutveränderungen festgestellt

Einschätzung

Dies sind sehr konservative Zahlen. Das russische Umwelt-ministerium bezifferte die Zahl der durch Tschernobyl kranken Menschen Anfang der 90er Jahre auf über 1,3 Millionen



Health effects – the children



Young cancer patient

Photo: Hermine Oberück

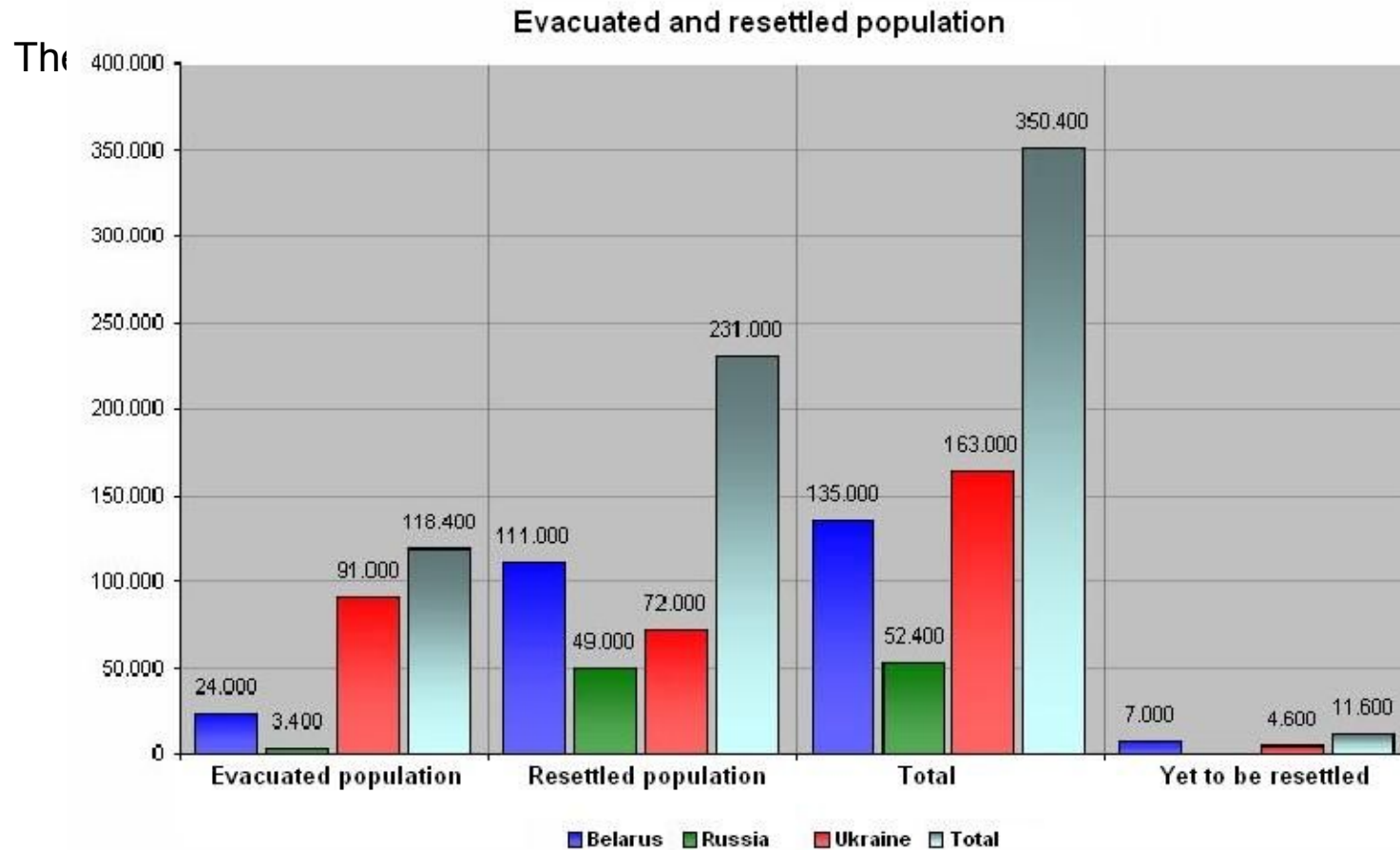


Criticism of the IAEA/WHO Study

- New and significant studies were ignored.
- More than 100,000 people left out of the calculations.
- The calculations did not include non-cancer diseases.
- 5,000 casualties are missing from the original study in the press release.



Other effects



Source: UNDP, 2002



Conclusion

There are no final answers on Chernobyl

The case „Chernobyl“ cannot be closed!