

**HEALTH OF SURVIVORS IN
DYNAMICS 20-YEARS AFTER
THE CHERNOBYL CATASTROPHE IN
UKRAINE**

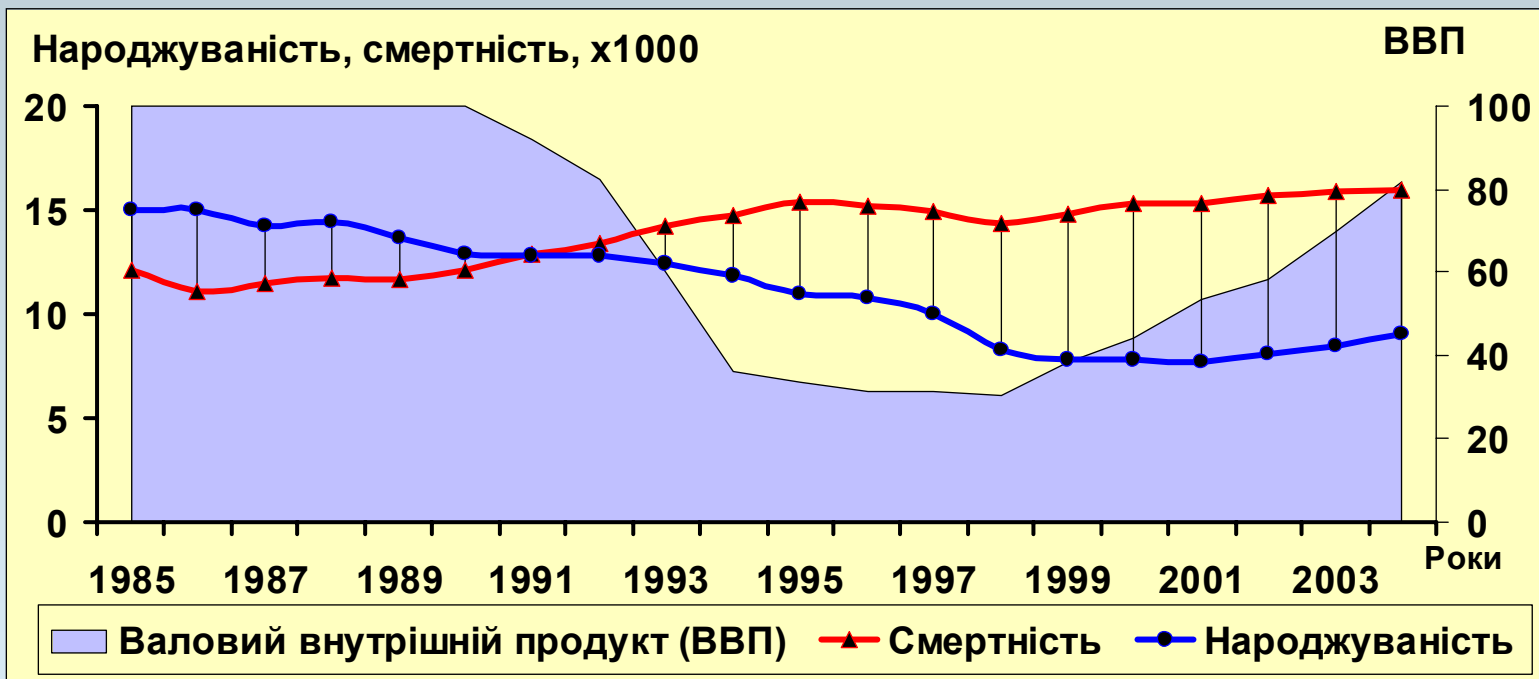
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UKRAINE***

Radiation Hotspots Resulting From the Chornobyl' Nuclear Power Plant Accident



Categories of people affected by the Chernobyl accident

- 1. **600** (, workers received whole-body doses of external radiation greater than 0,1 Gy - 6 Gy.
- 2. **240,000 clean up workers or liquidators 800) emergency workers**, who were involved during the first day of the accident. Of these who, from 1986 to 1989, were sent in to the power station or the zone surrounding it for decontamination work, sarcophagus construction, and other cleanup operations. Their average dose was more 100 mSv.
- 3. **400,000 persons who were evacuated and resettled (within 2 weeks of the accident and 16,000 more before the autumn of 1986)**. Their average dose was 33 -50 mSv mSv and more.
- 4. The approximately **5 -7 million residents of contaminated areas** in Belarus, Ukraine and Russia. Their average dose was 10 mSv and more.
- **Children – more than 3 million/**
- 5. Near **600 million people who live in the rest of Europe**.



Major changes in lifespan

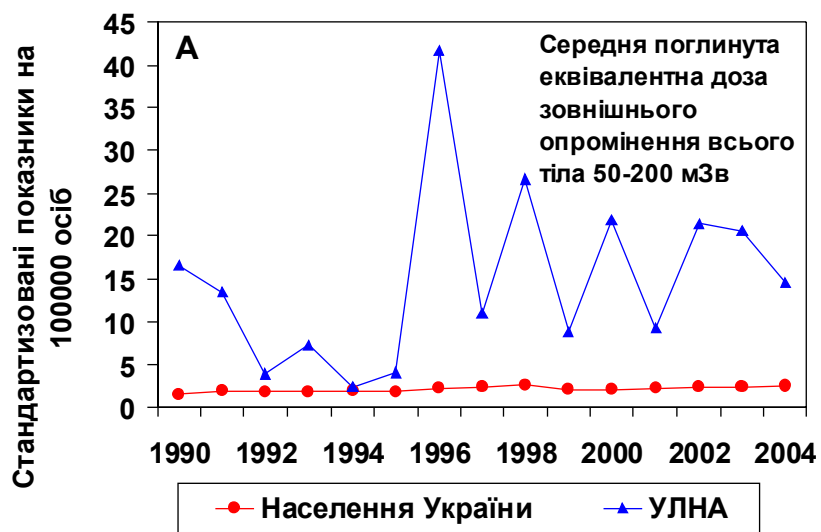
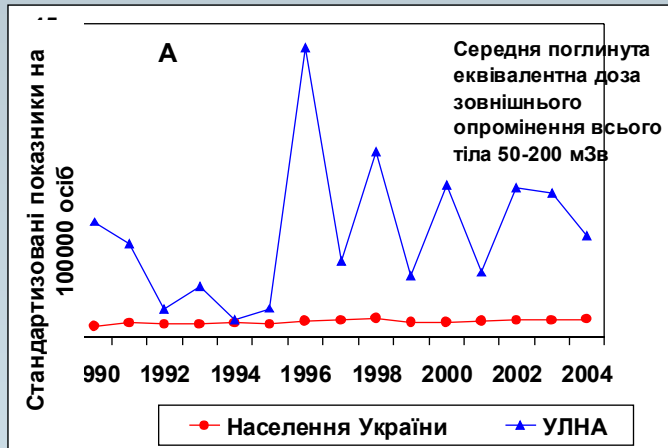
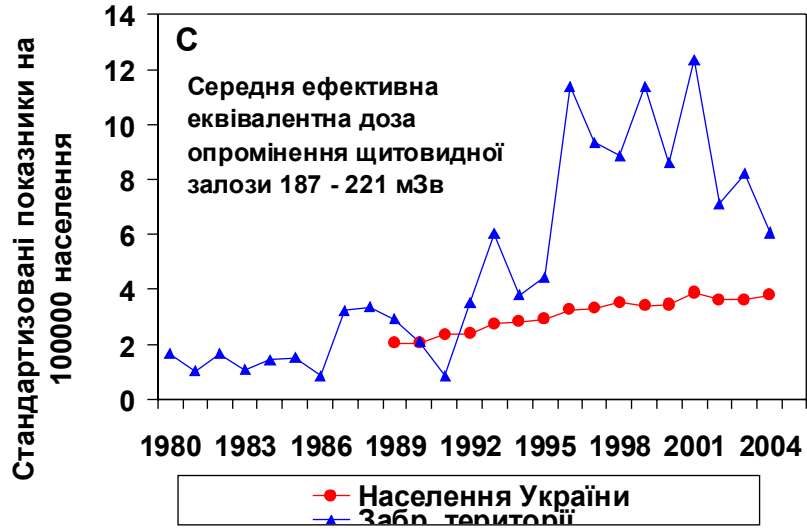
Major changes in lifespan over last 2 decades even in non-contaminated areas complicate analysis

Indicator	Belarus	Russia	Ukraine	Poland
Population (total), millions	10.3	147	49	39
age 0-14	19%	18%	18%	19%
15-64	68%	69%	68%	69%
65+	13%	13%	14%	12%
Birth rate / 1000	9	9.0	9.0	10
Death rate / 1000	14	15	16	10
Infant mortality / 1000 live births	15	19	22	10
Life expectancy at birth	68	67	66.0	73
For males	62.6	58.4	66.7	70.6
For females	74.3	72.1	72.9	78.7

The health effects resulting from Chernobyl catastrophe

- (1) Thyroid cancer
- (2) Leukaemia
- (3) Solid cancers
- (4) Non-cancer effects
- (5) Heritable effects
- (6) Mental health and psychosocial effects.

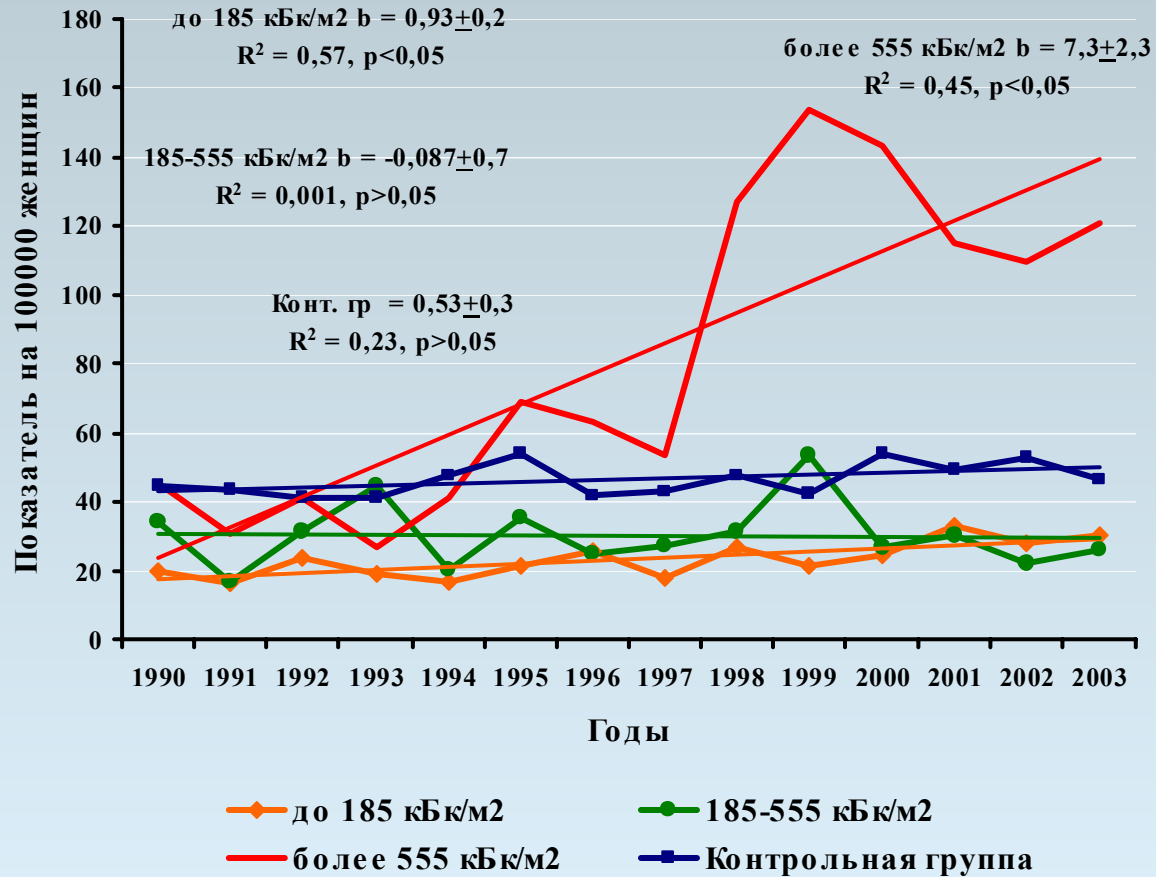
Thyroid cancers in Ukraine



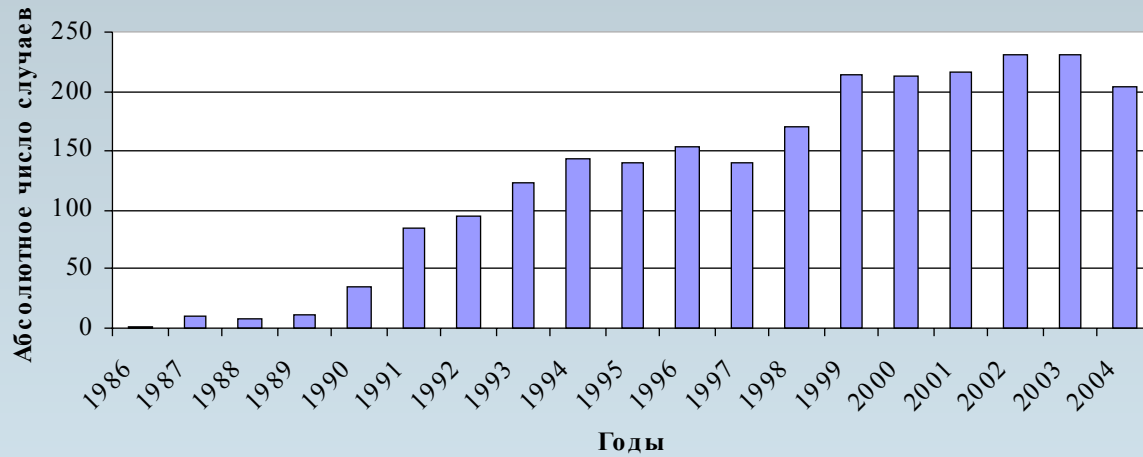
RESUME

- 1. The younger person exposed, the greater the subsequent risk of developing thyroid cancer. For a given intake of radioiodine, children will receive the highest thyroid dose, as their thyroid glands are smaller and still growing;
- 2. The risk of thyroid cancer is greater when there is iodine deficiency; dietary iodine supplements can reduce the risk, even if administered some time after the exposure to radiation;
- 3. The power of a study is the probability of detecting a given difference. Even if a difference is real, if it is small and the size of the groups we are comparing is small, there will only be a very small probability of detecting the difference.

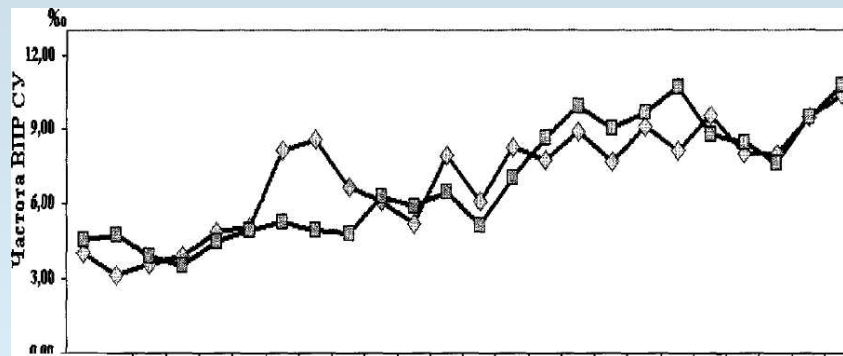
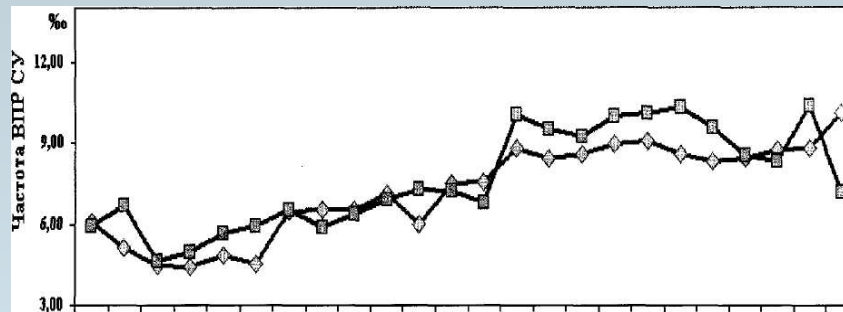
Breast cancer in Belarus



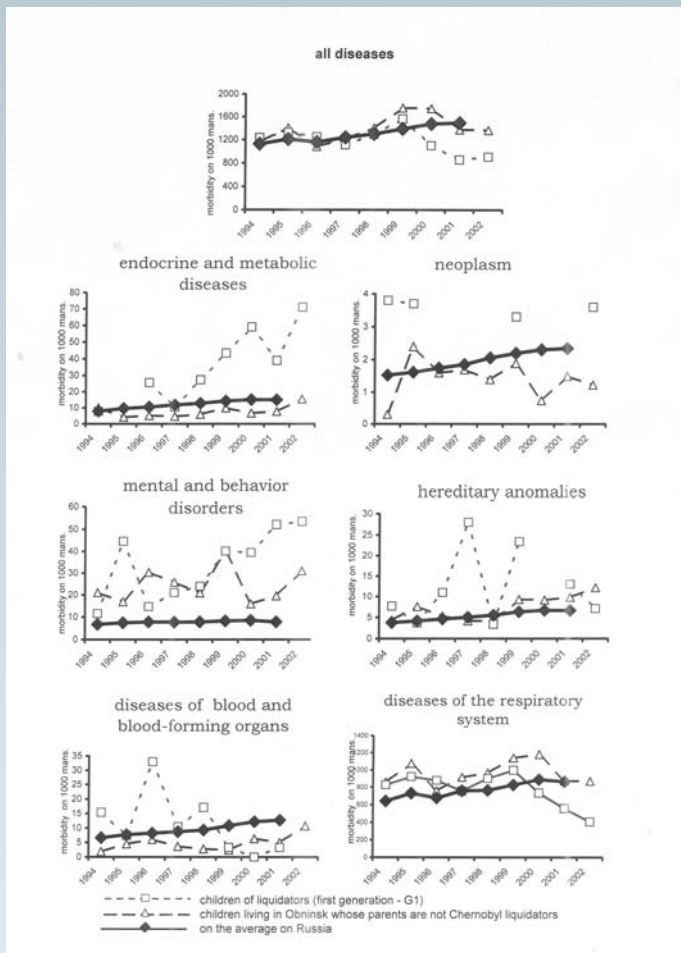
Thyroid cancer in Republic of Belarus



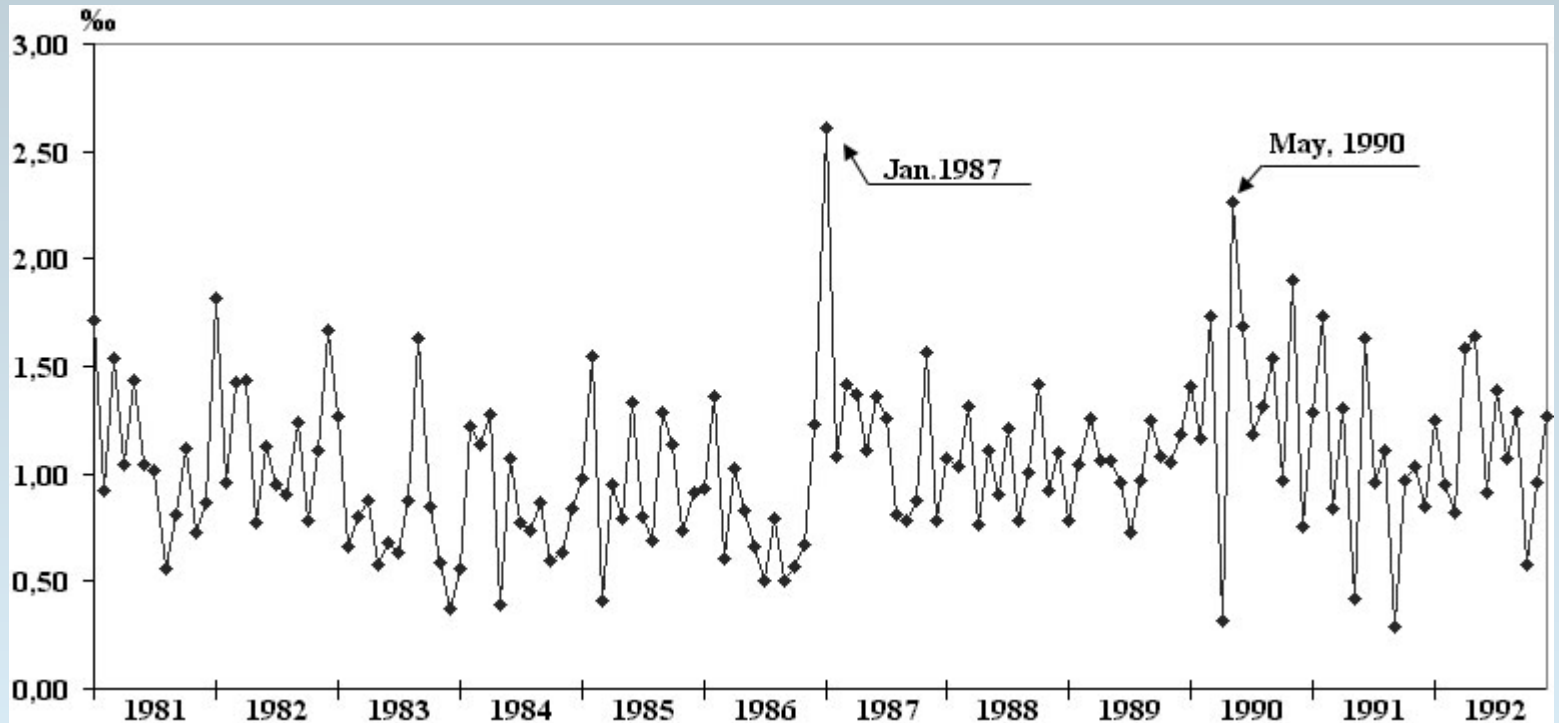
Heritable effects in Republic of Belarus



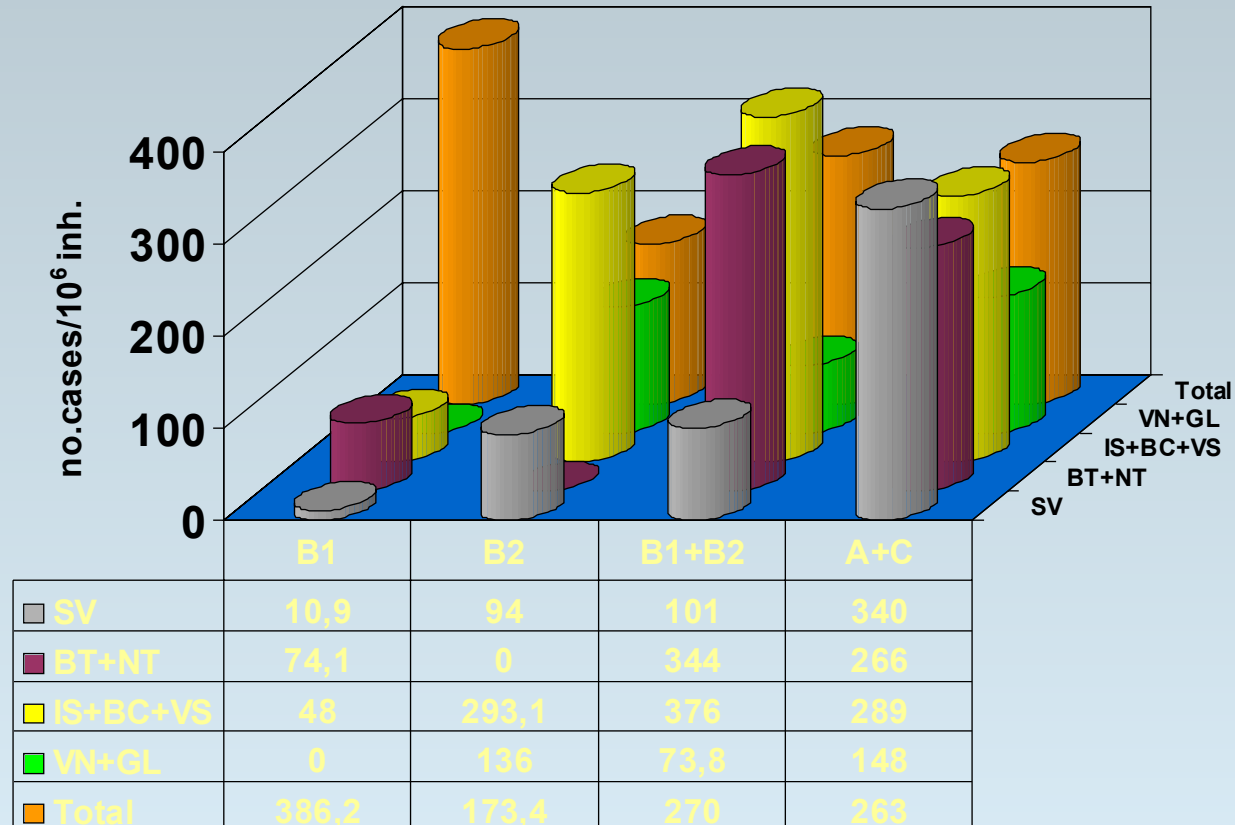
INCIDENCE RATES FOR ALL CLASSES OF DISEASES (ICD-10) AND SEPARATE CLASSES OF DISEASES (PER 1000) AMONG CHILDREN OF LIQUIDATORS AND CHILDREN OF CONTROL GROUPS (Tsyb A.F. and al., 2004)



Downe's syndrome in Republic of Belarus (Zatsepin I.O and al., 2005)



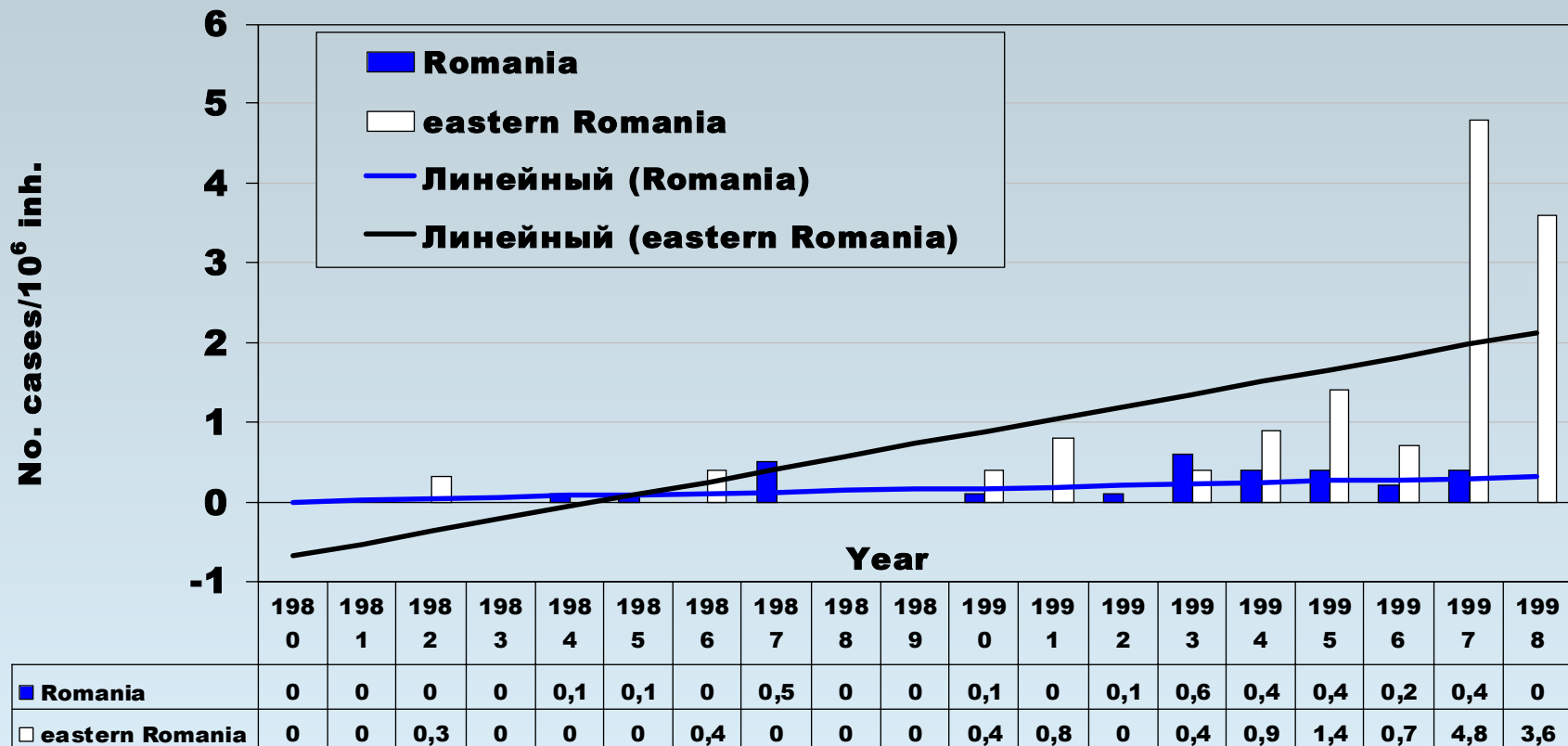
The cumulative incidence rate of leukaemia in group 0-10 y (Davidescu D. and.al., 2004)



TRENDS IN INFANT LEUKAEMIA IN EASTERN ROMANIA IN RELATION TO “IN UTERO EXPOSURE” DUE TO ChERNOBYL ACCIDENT (Davidescu D. and. Al/2004

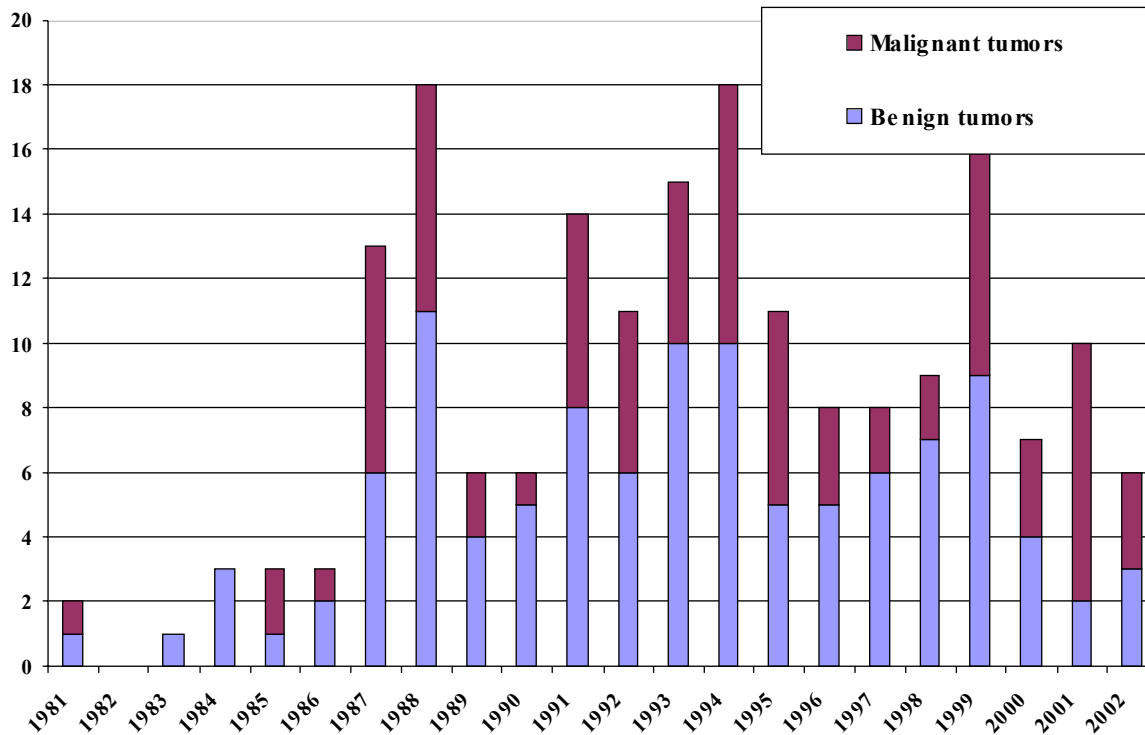
- **The incidence of infant leukaemia in the “exposed”**
- **group was higher than that in the “unexposed” group of**
- **children 0-10 years.**
- **The incidence rate of children born July 1986 to March 1987 was statistically significant higher than the incidence rate of**
- **children born July 1986 to March 1987.**
- **The incidence rate was correlated with red bone marrow**
- **equivalent dose.**

The trend of thyroid cancer in children 0-14 years in Romania and eastern Romania

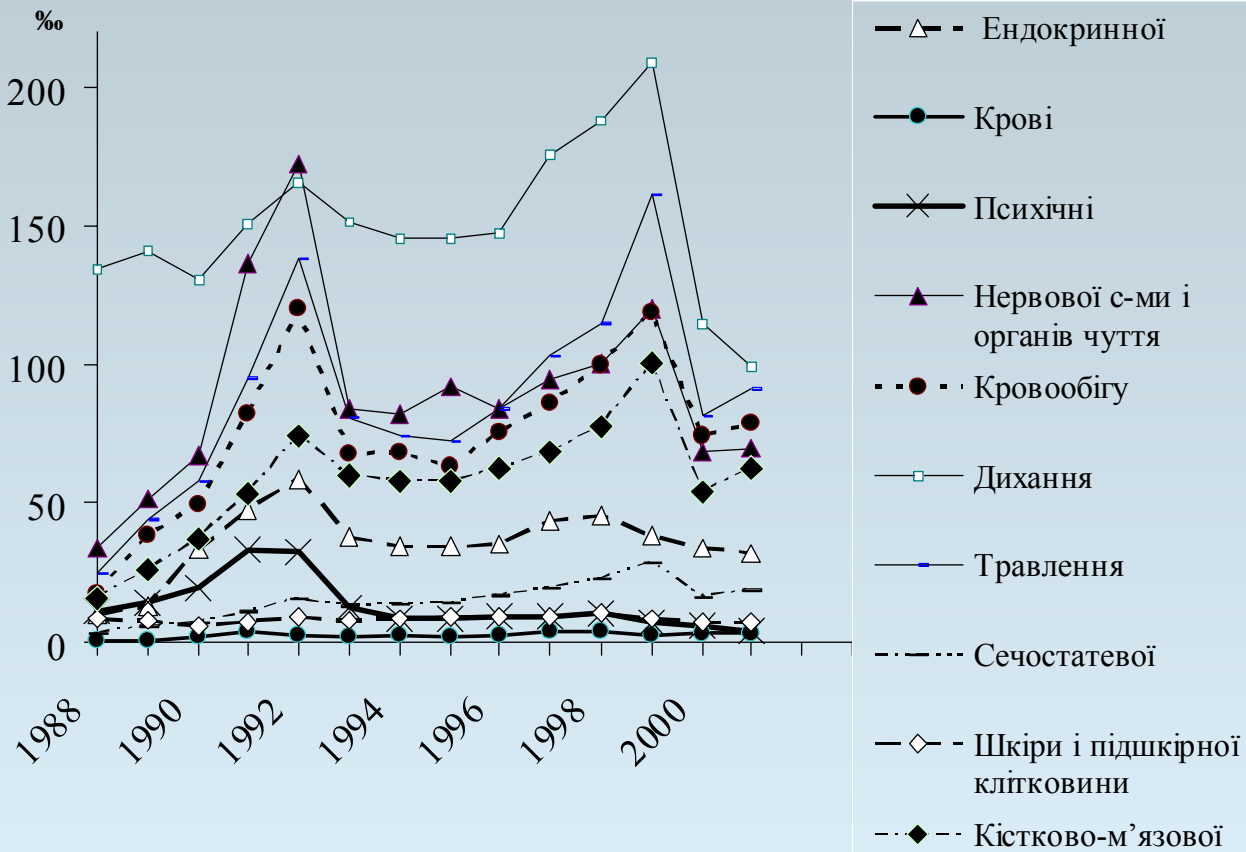


CENTRAL NERVOUS SYSTEM TUMOR INCIDENCE DYNAMICS AMONG CHILDREN AGED UNDER 3 YEARS

Y.A. Orlov, A.V. Shaversky, 2004



Non-cancer effects (liquidators)



Mental Health and Psychosocial effects

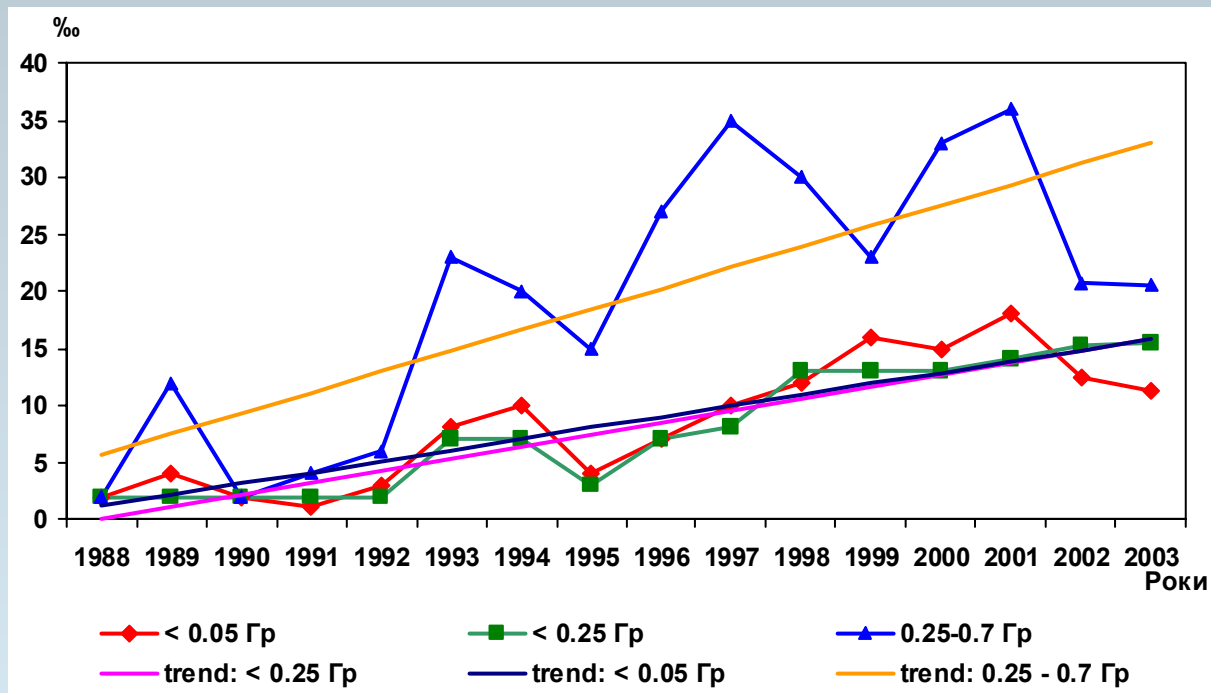
It is widely accepted that the Chernobyl accident has resulted in a complex of direct and indirect factors which adversely affect the health of exposed people. These factors are considered by the affected people themselves to be significant and dangerous. They include the following:

radioactive contamination of the environment by caesium, strontium, and plutonium;

ingestion of contaminated food;

anxiety over higher illness rates among children.

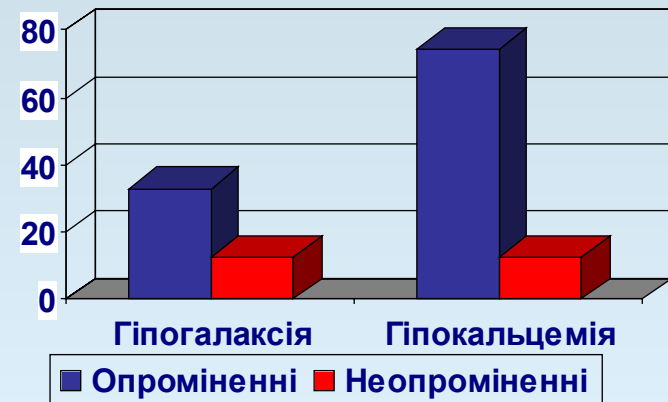
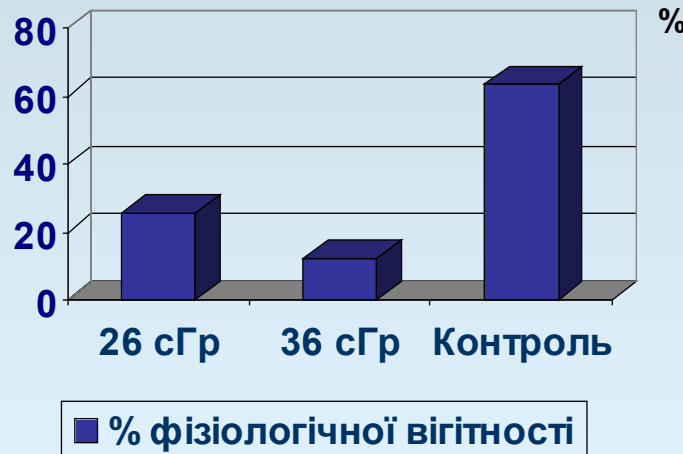
Cerebrovascular diseases (Ukraine)



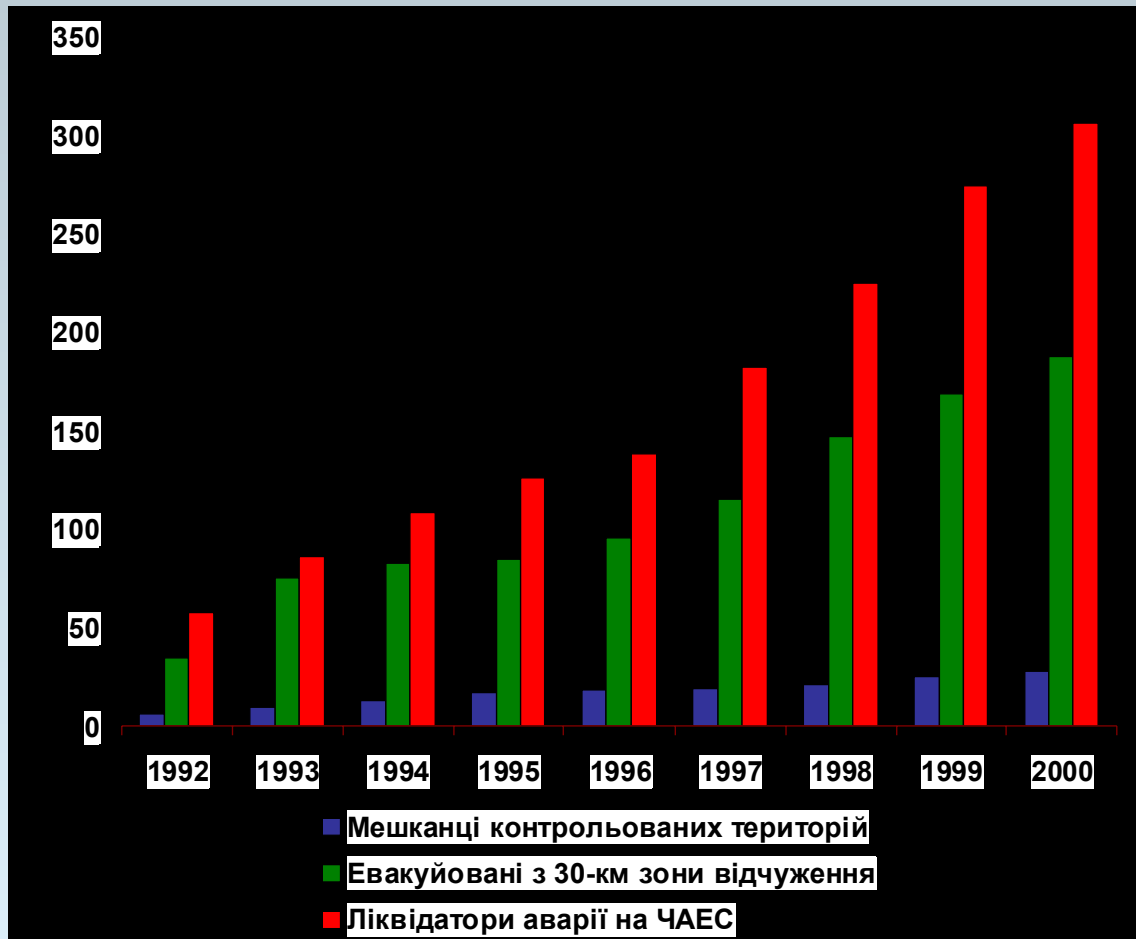
Pregnancy and thyroid

У дівчаток, які одержали в 1986 р. 26 або 36 сГр на щитоподібну залозу, у дітородному віці нормальне протікання вагітності спостерігалось тільки в 25.8 і 12.5% випадків, тоді як у контролі, фізіологічний плин вагітності виявляли в 63.3 % у неопромінених матерів.

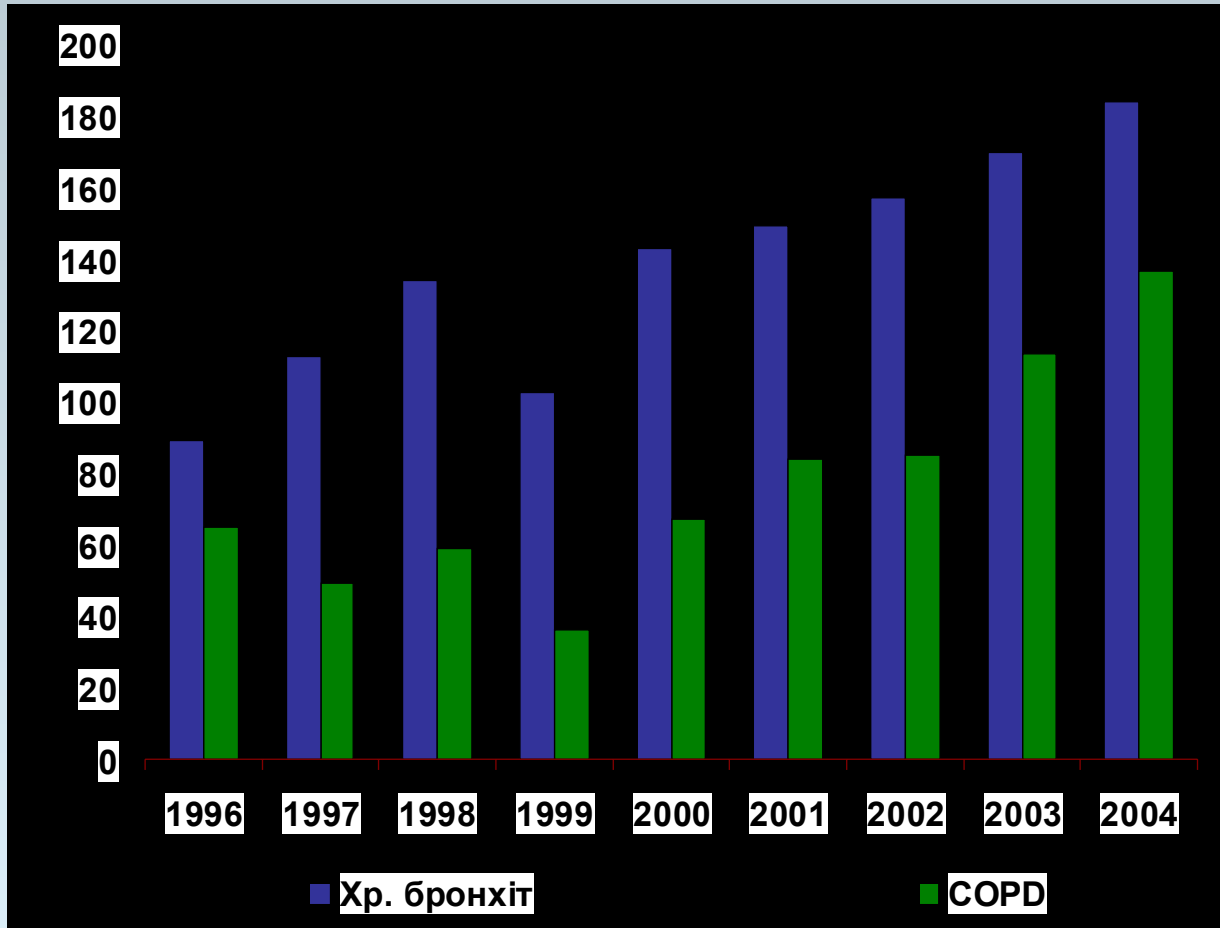
В опромінених матерів знаходили високий рівень первинної й вторинної гіпогалакції (33.8%), тоді як у контролі в 12.5% випадків, а гіпокальціємії в 74.2% і 12.5%, відповідно. Вони народжували в 1.5-2 рази більше дітей з відхиленнями у фізичному розвитку, чим неопромінені жінки.



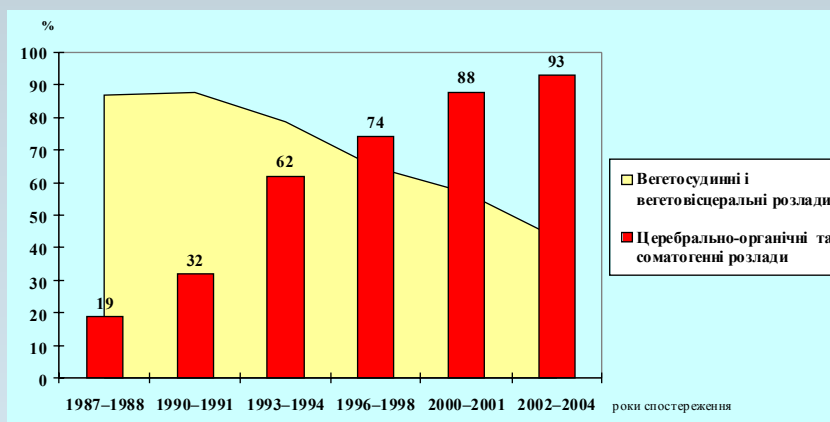
Prevalence of chronic thyroiditis (Ukraine)



Prevalence of lungs diseases of liquidators (Ukraine, RCRM)



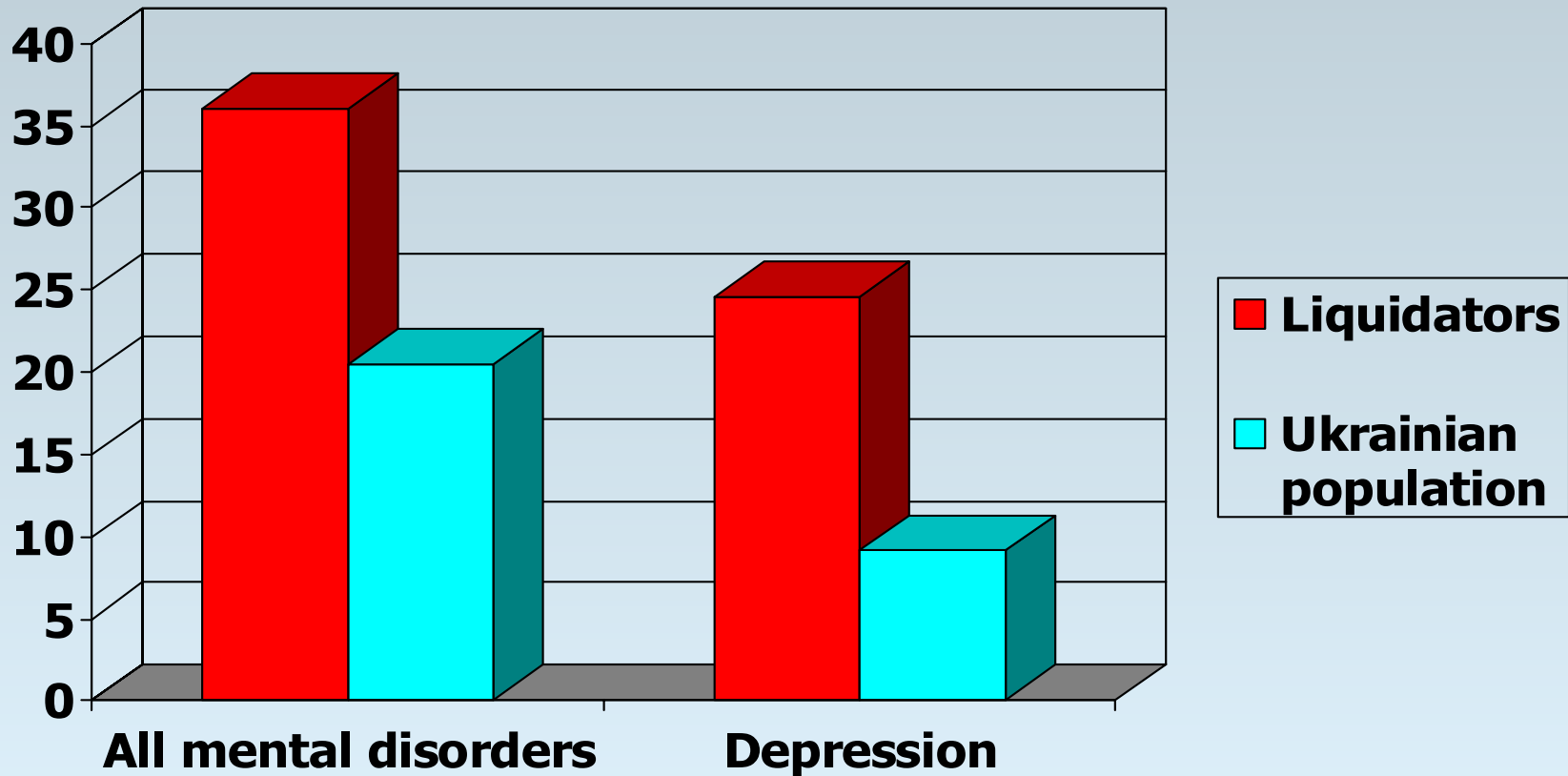
Cerebrovascular diseases of liquidators (Ukraine, RCRM)



MRT - radiation encephalopathy



Prevalence of psychological disorders in liquidators (2005)



RESUME

- Long-term monitoring in the three affected countries has made it possible to select cohorts of children and teenagers exposed to radiation, with a view to
 - continued observation of genetic and oncological diseases;
 - epidemiological investigations on the healths of survivors of different ages;
 - studies on new approaches to the diagnosis, prophylaxis and treatment of low dose radiation-related diseases (with special attention to molecular-genetic studies and estimating the impact of genomic instability on morbidity of offspring);
 - changing approaches to overcoming of psychosocial problems of affected children.
- The Conference also demonstrated that epidemiological research had been conducted on thyroid cancer in children and teenagers at the time of the accident, when studies on radiation-induced non-cancer diseases were lacking.

Resume

- Abnormal psychological development has been detected
- in 60-70% of children and teenagers exposed to radiation.
- This is two times higher than among general population.
- More than 60% of teenagers see their futures away from home because radiation pollution;
- affected areas would suffer from depopulation and decline if this occurred. Therefore, the coordination of efforts between governments, international organizations and voluntary organizations and all people of goodwill towards the
- solution of this complex of economic, ecological, medical
- and social problems of affected children and youth is very important.

**Chernobyl is not only pain of past,
but the current problem and future
challenge.**

