

CANCER EPIDEMIOLOGY IN THE REPUBLIC OF BELARUS

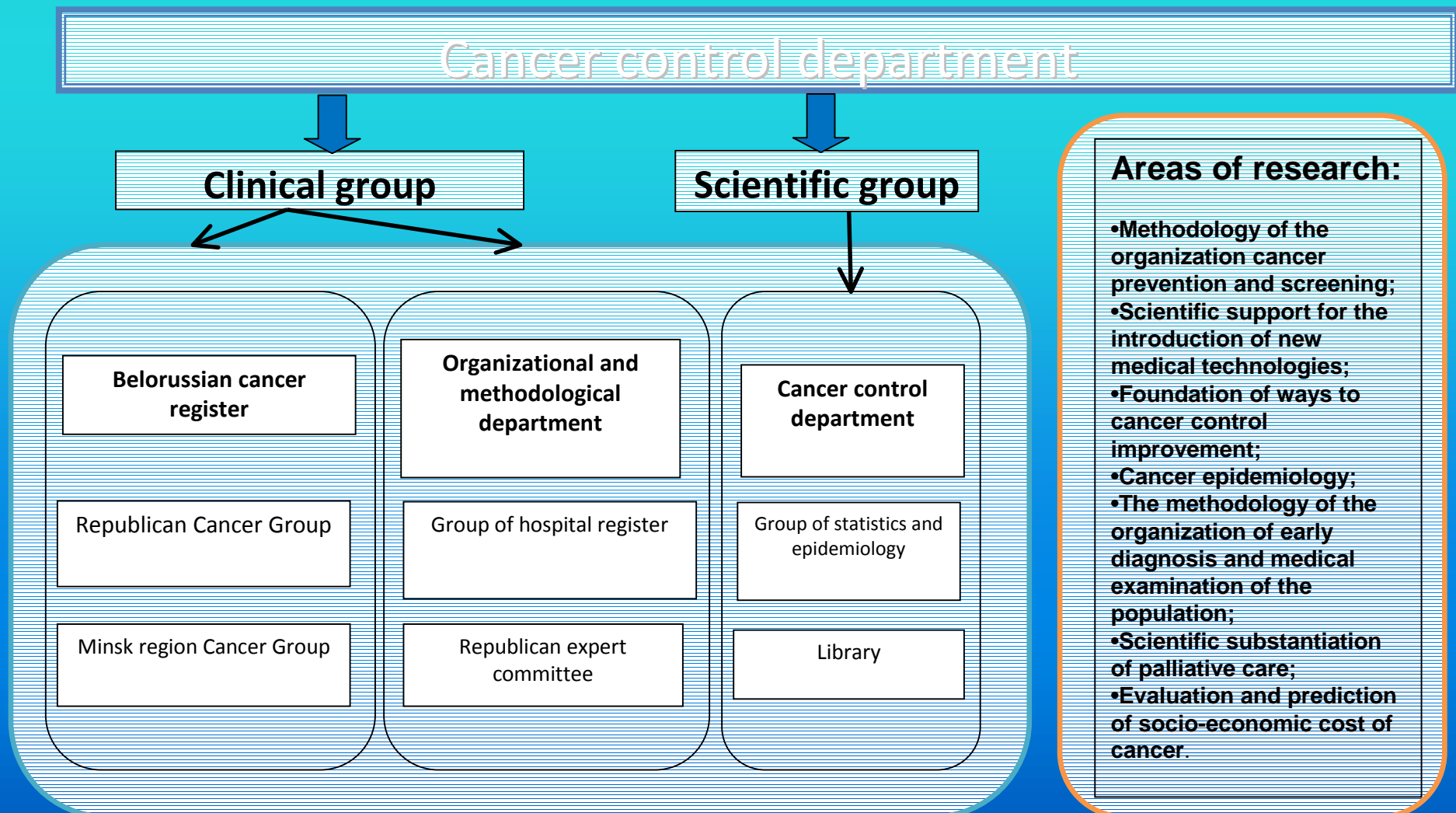


N.N. Alexandrov National Cancer Centre Of Belarus

***Olga Zubets
(Prof. A. Okeanov)***

Minsk, Belarus 2014

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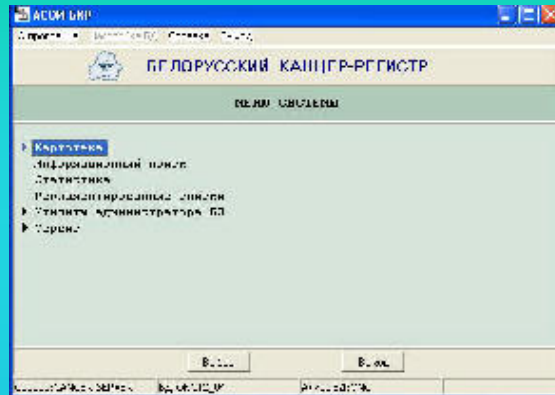
Areas of research:

- Methodology of the organization cancer prevention and screening;
- Scientific support for the introduction of new medical technologies;
- Foundation of ways to cancer control improvement;
- Cancer epidemiology;
- The methodology of the organization of early diagnosis and medical examination of the population;
- Scientific substantiation of palliative care;
- Evaluation and prediction of socio-economic cost of cancer.

Development of cancer registration system in the Republic of Belarus

Time periods	Activities
1953–1956	Introduction of obligatory cancer registration system
1966–1971	Experience in centralized automated data processing
1972–1973	The start of cancer registry functioning. A database on magnetic carriers
1974–1984	Cancer registry functioning on centralized basis
1985–1989	Adoption of cancer patient surveillance monitoring system
1990–1999	Adoption of personal computers, database managing directly in cancer dispensaries. Improvement of classifiers, information monitoring system, database structure allowing for international standards
2000–2012	Improvement of the current system of cancer registry. Adoption of a new Windows version guided by MS SQL Server

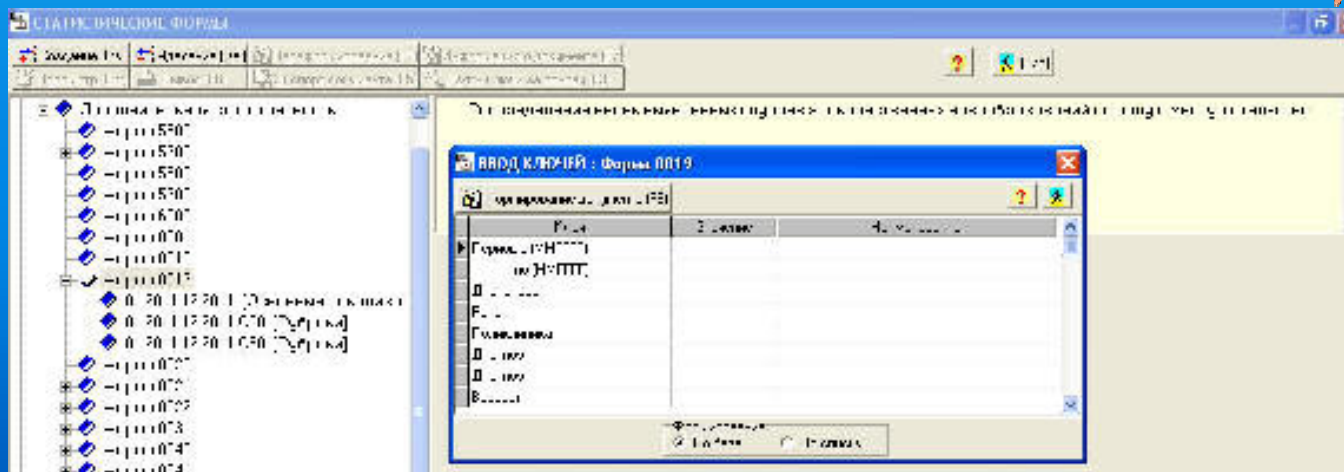
Cancer Registry of the Republic of Belarus



6 areas
118 districts
population 9 503 807
(4 420 039 male, 5 083 768 female)



Area:
207 560 km²



During 40 years (1970 – 2012) in the

Republic of Belarus

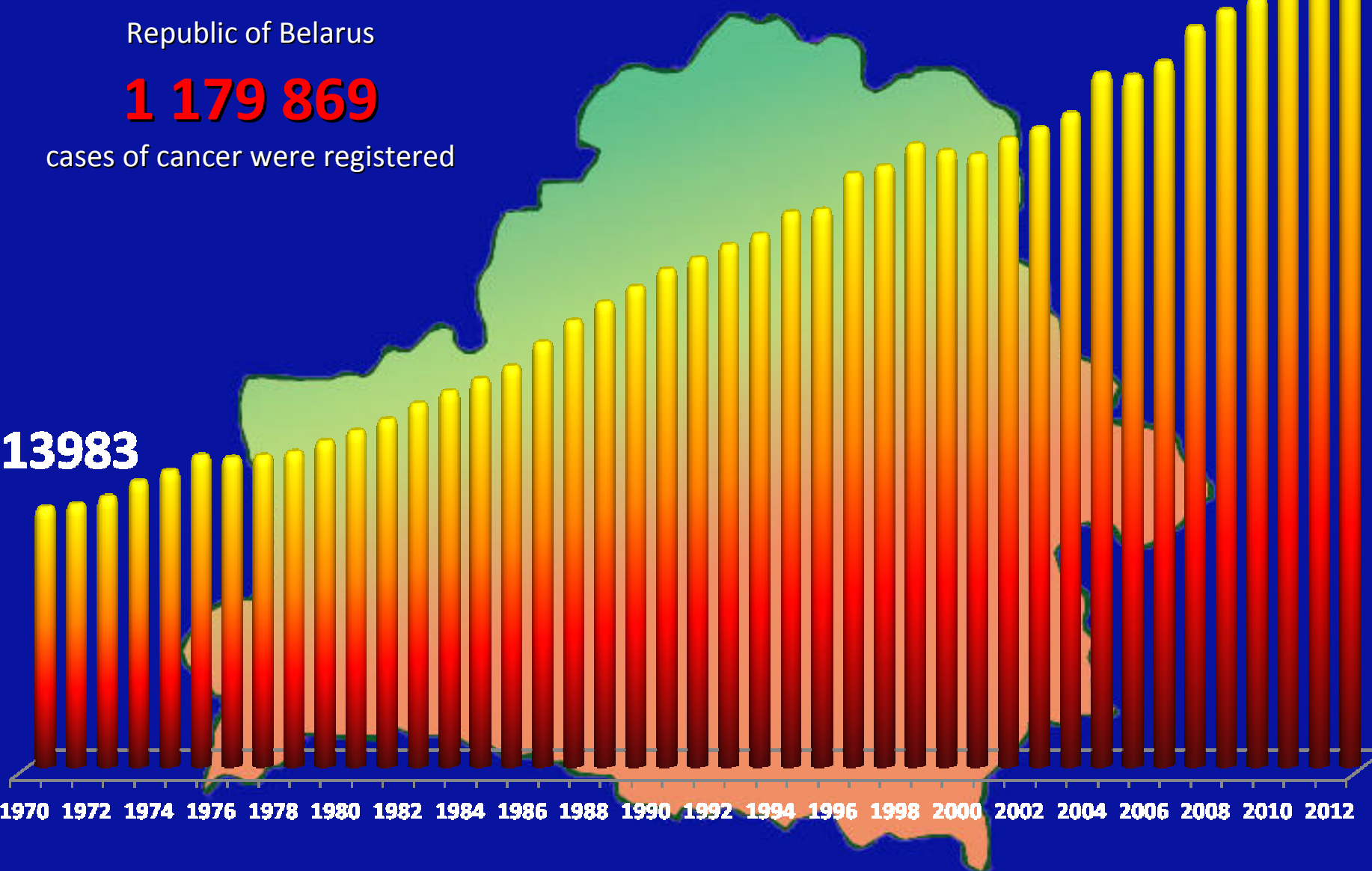
1 179 869

cases of cancer were registered

43620

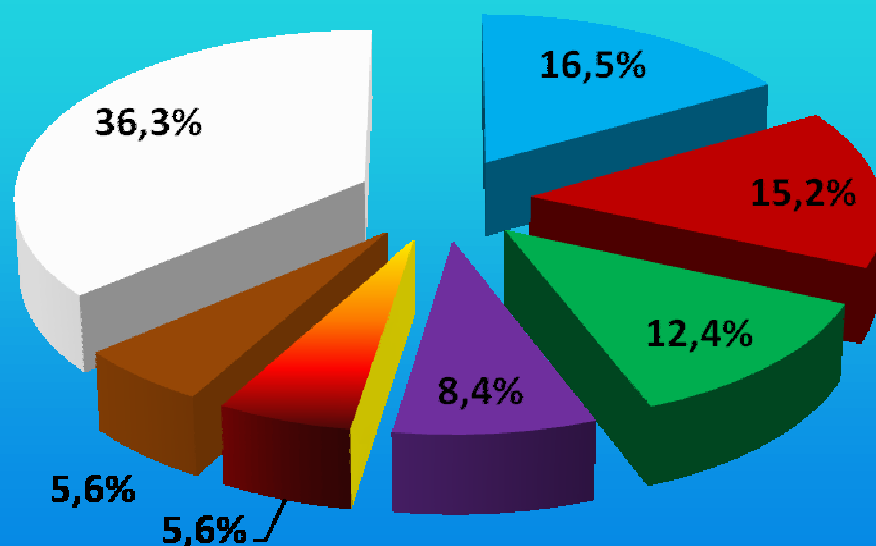
13983

1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012

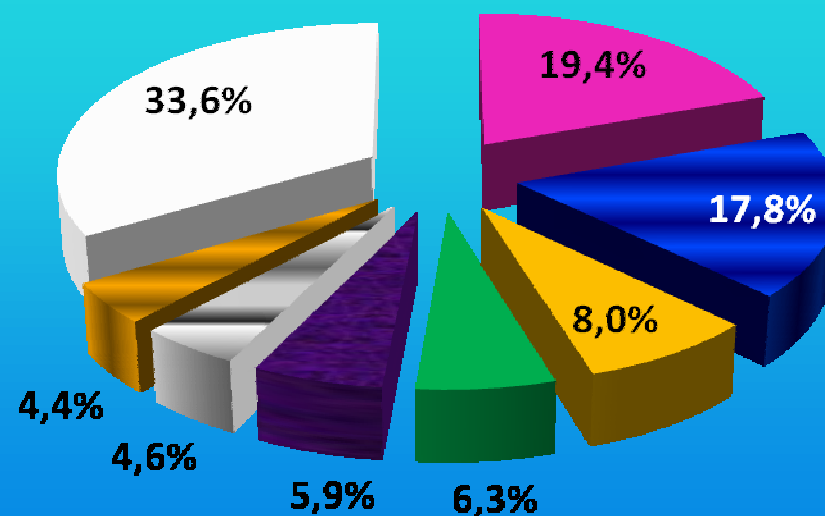


Structure of cancer incidence in the Republic of Belarus

Males



Females



2012

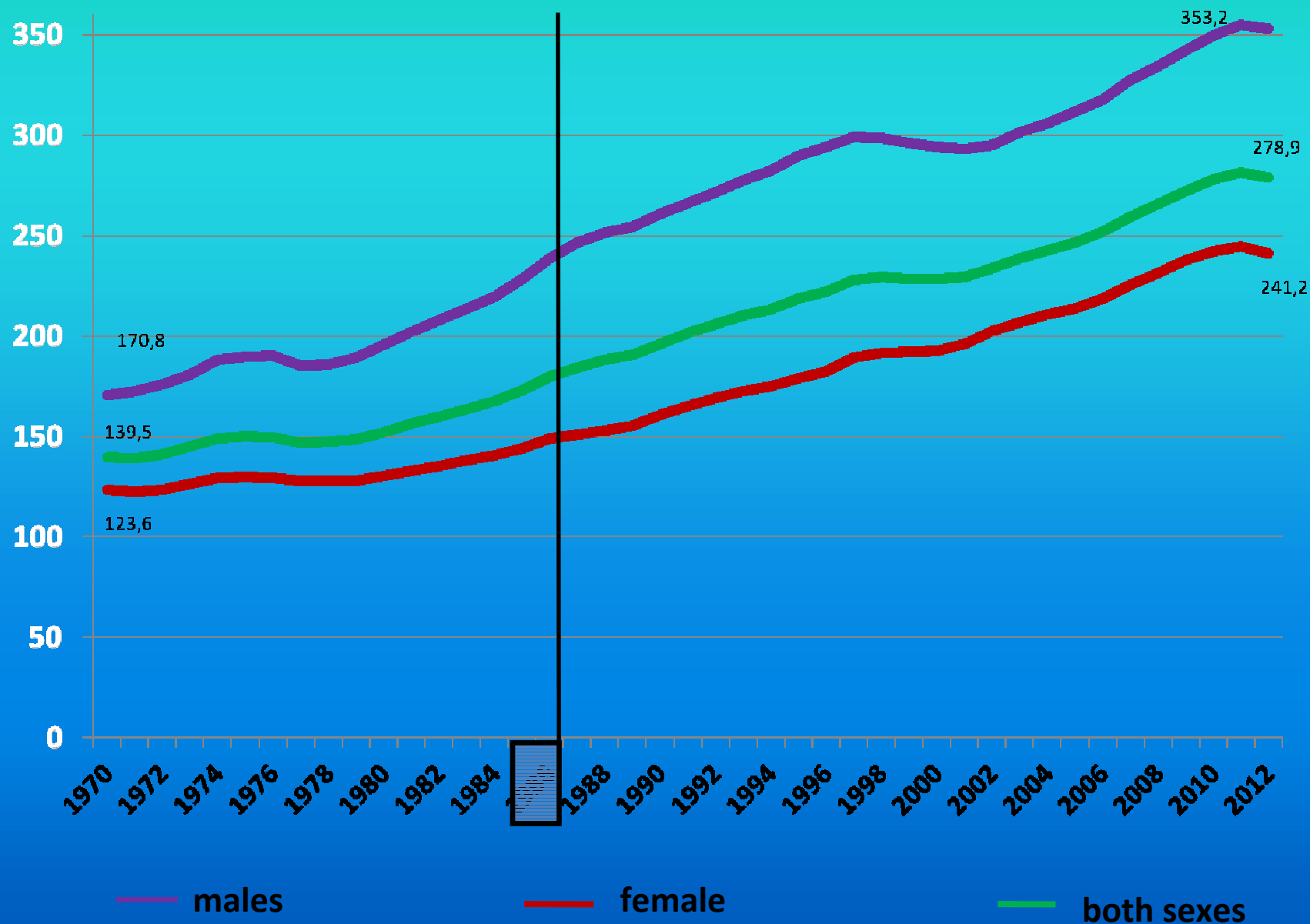
Lung
Skin
Kidney
Other

Prostate
Stomach
Colon

Skin
Corpus uteri
Stomach
Thyroid

Breast
Colon
Ovaries
Other

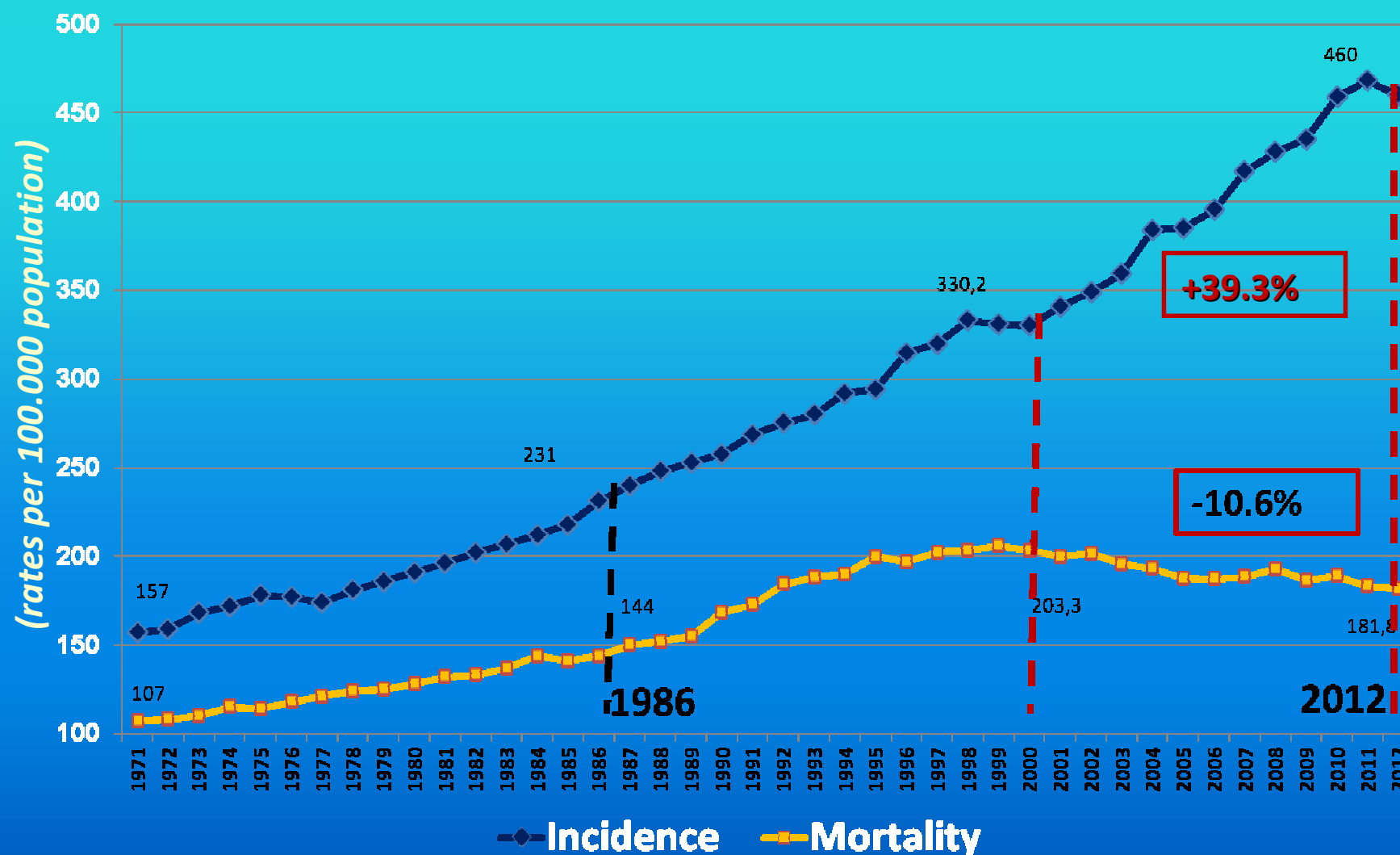
Standardized incidence rates for all sites of cancer in the Republic of Belarus (1970-2012)



The main trends of incidence dynamics of male and female population of the Republic of Belarus (1986-2012)

Cancer site	ICD10	Incidence per 100000				Increase in %	Trends of incidence dynamics
		1986	1989	2000	2012		
Prostate	C61	9,8	12,9	25,1	74,3	476%	highest
Thyroid	C73	1,5	2,2	9,4	12,2	455%	
Kidney	C64	4,0	5,2	12,6	21,4	312%	
Skin	C44	24,4	22,7	37,4	72,7	220%	
Colon	C18	9,0	10,5	15,8	27,1	158%	high
Multiple Myeloma	C88-90	1,0	1,1	1,9	2,6	136%	
Corpus uteri	C54	12,4	14,8	20,9	34,8	135%	
Non-Hodgkin's lymphoma	C82-85	2,7	3,1	4,5	7,1	129%	
Breast	C50	32,3	34,3	51,7	77,3	125%	middle
Bladder	C67	5,5	7,3	10,5	12,8	75%	
Rectum	C19-21	10,9	12,2	17,8	20,5	68%	
Esophagus	C15	2,7	3,2	3,8	5,1	59%	
Ovaries	C56	12,8	13,3	15,6	19,9	50%	low
Larynx	C32	4,9	5,2	5,5	6,3	21%	
Cervix	C53	15,2	14,8	15,8	17,7	20%	
Lung	C33-34	32,4	36,5	43	43,2	18%	
Leukemia	C91-95	5,8	9,5	10,2	10	5%	negative
Hodgkin's lymphoma	C81	2,3	2,8	2,6	2,6	-7%	
Stomach	C16	39,2	39,9	36,7	32,6	-18%	
Bones	C40-41	1,6	1,6	1,3	1	-38%	
Lip	C00	4,2	4,1	2,9	2	-51%	
All sites	C00-96	227,4	251,1	330,2	457,8	82,3	

Trends of cancer incidence and mortality of population of Belarus



Radioinduced Cancer

Since the Chernobyl accident, our center has been taking the monitoring of incidence of malignant neoplasms in pollution areas.

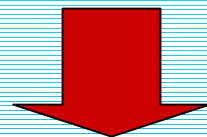
The Center was taken part in a number of international projects

- The incidence of affected population*
- Linkage data between BCR and Chernobyl registers*
- Incidence of breast cancer*
- Incidence of thyroid cancer*

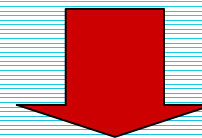
**Cancer
Registry**



**Chernobyl
Registry**

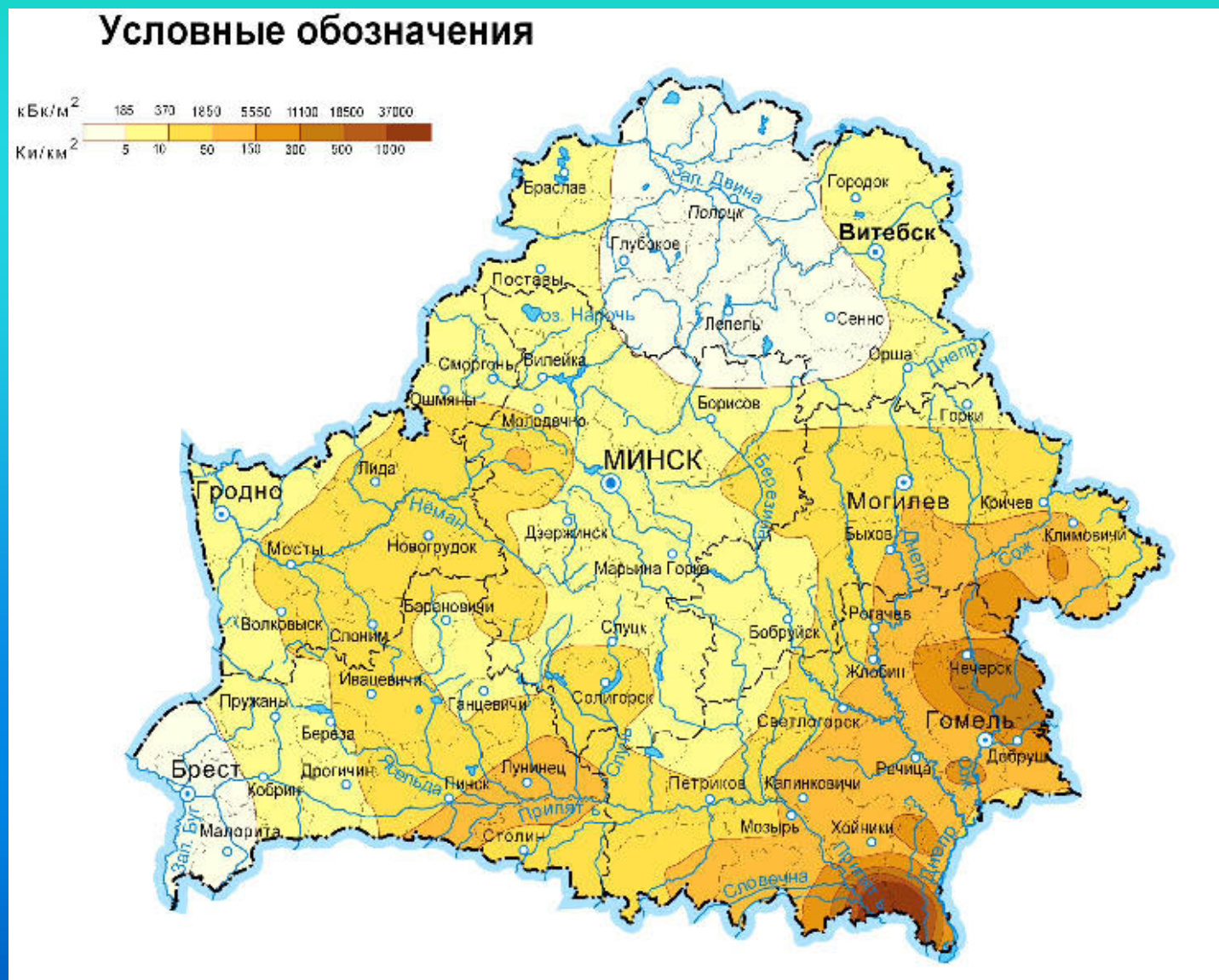


**Materials of
cancer
populational
statistics**



**Materials for
assessment
of health state
of affected
population**

The contamination of the territory of Belarus with iodine-131 (reconstruction) estimated on 10 May, 1986

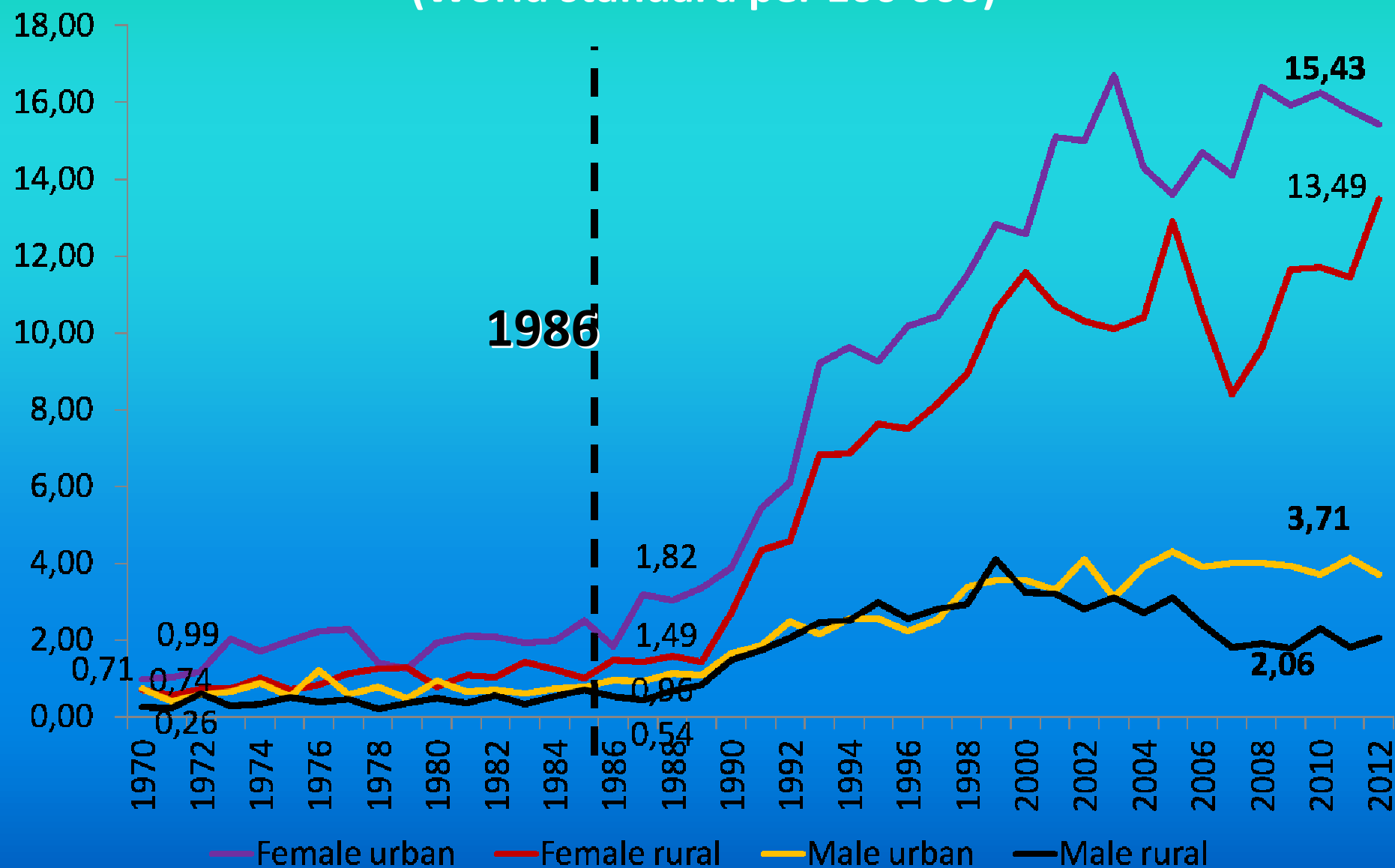


The spread of radioactive iodine

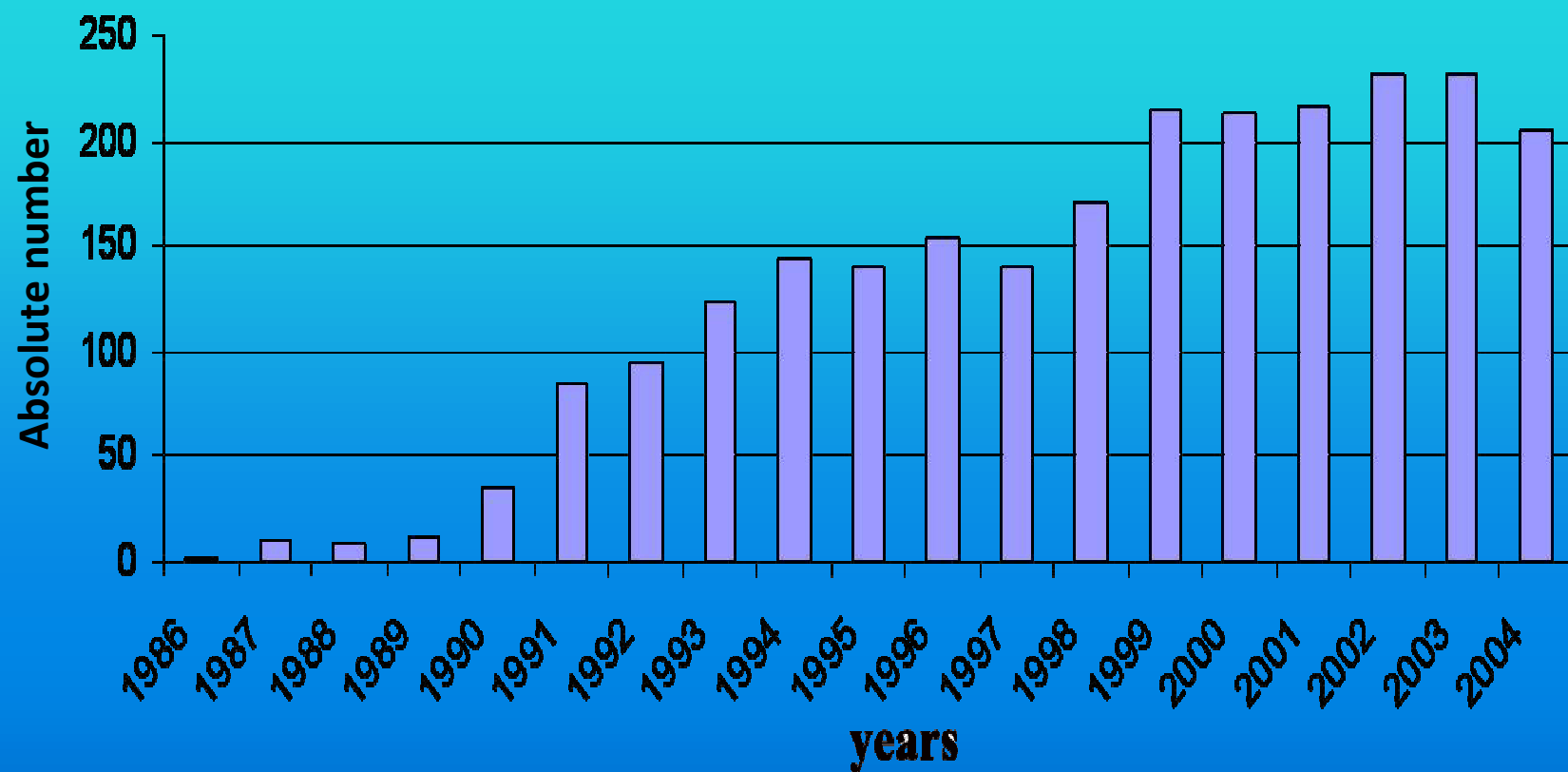
- 26.04.1986
- 27.04.1986
- 28.04.1986
- 29.04.1986



Age standardized incidence rates of thyroid cancer (World standard per 100 000)

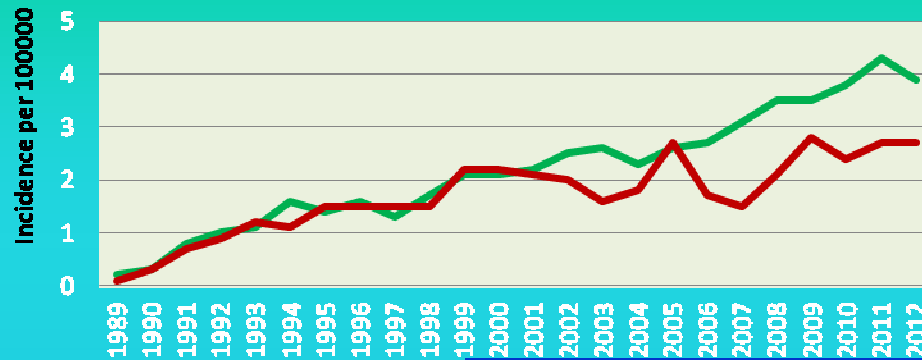


Dynamics of the absolute number of new cases of thyroid cancer among exposed at the age of 0-18 years



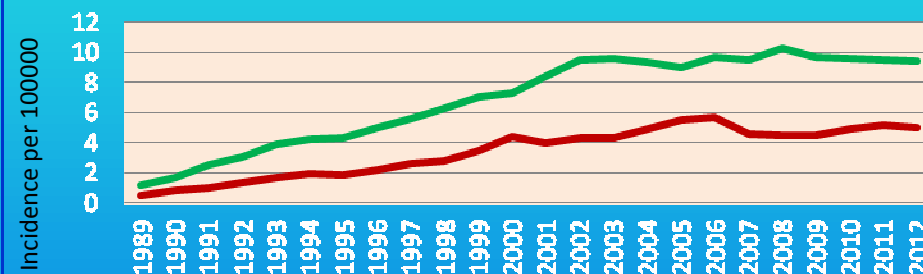
Thyroid cancer (cohorts at the moment of Chernobyl accident)

Children and adolescents (0-17 years old)



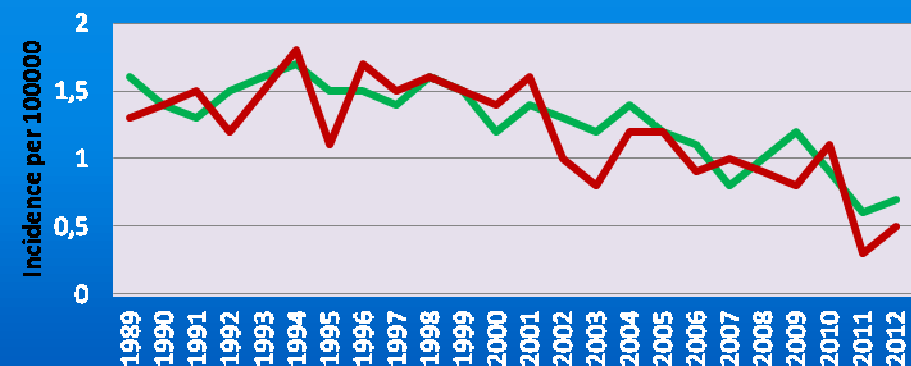
20-49 years old

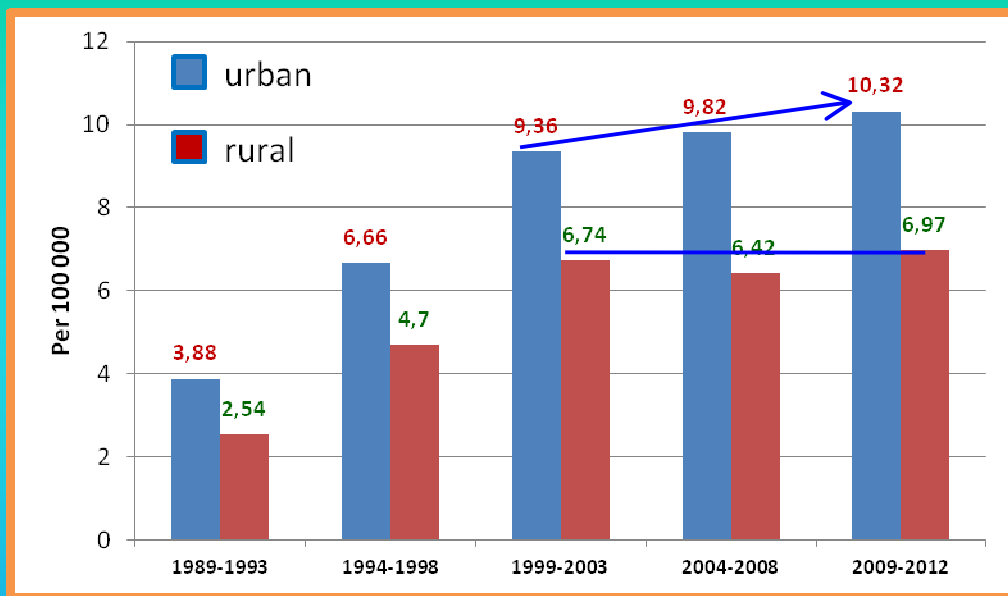
— urban
— rural



Increasing incidence in the exposed
population younger than 50 years old

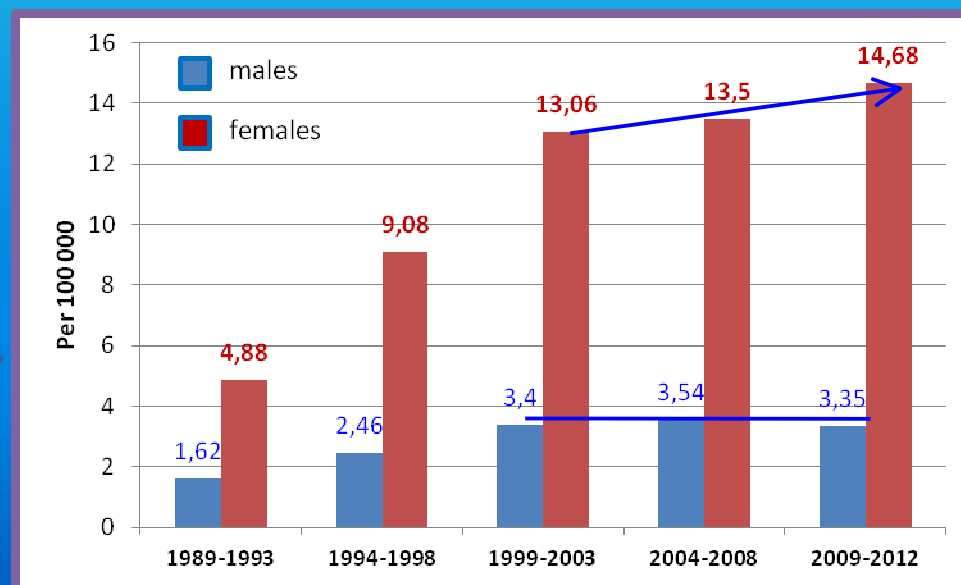
50 and elder



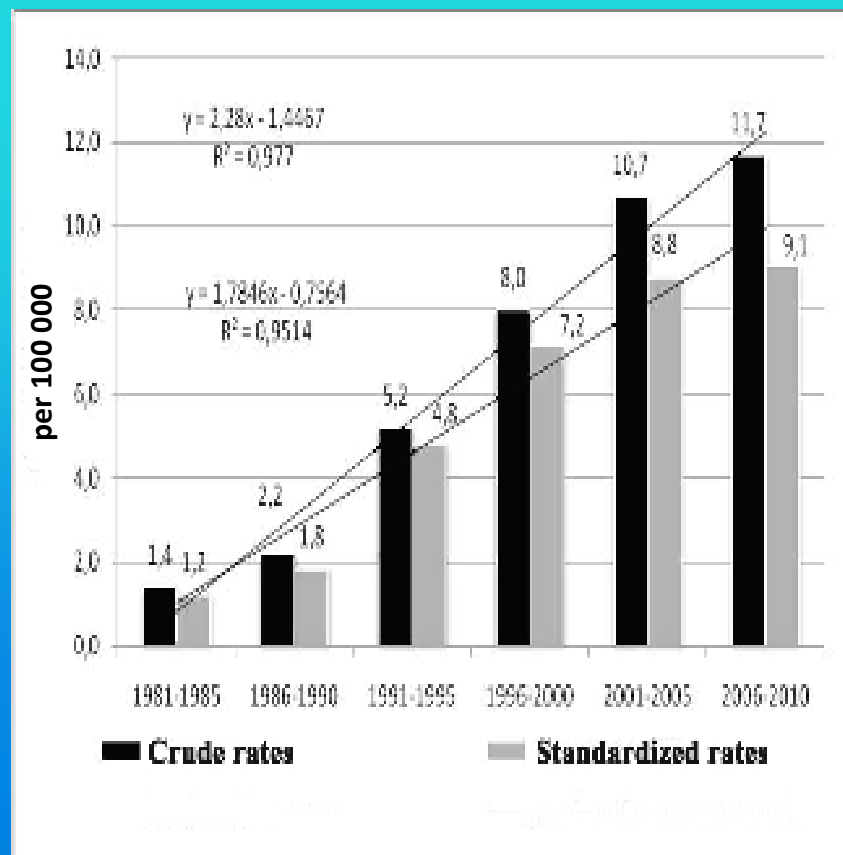


Age standardized incidence rates of thyroid cancer

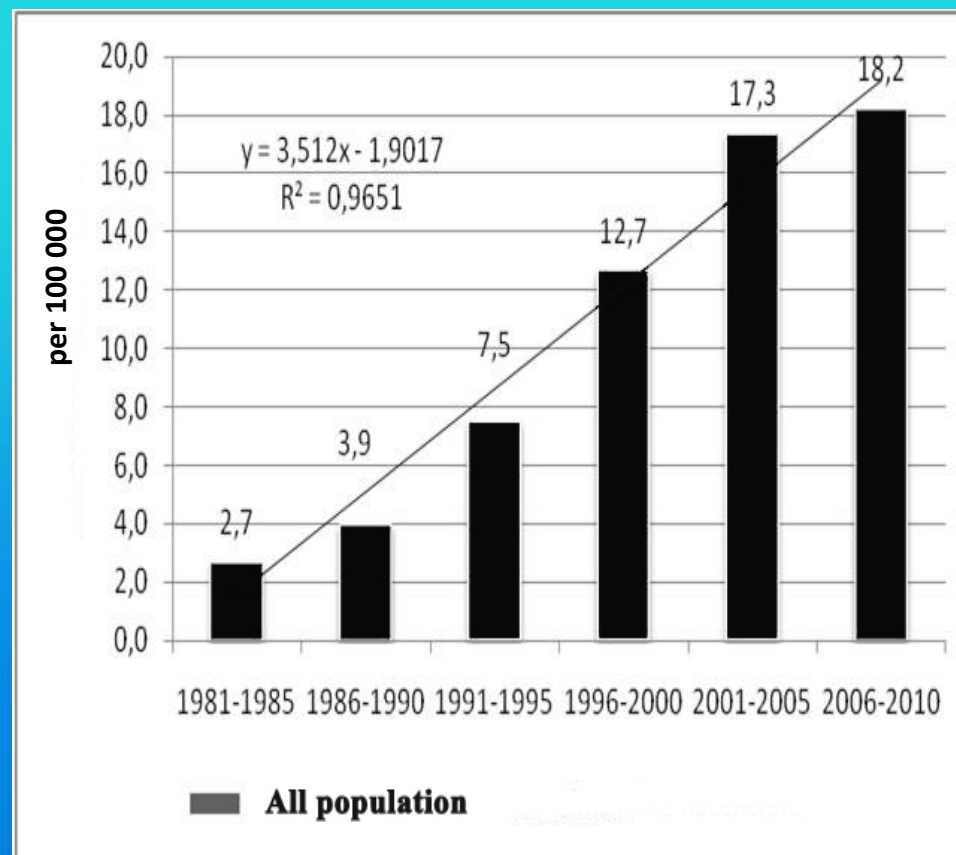
increasing of incidence in females and urban population



The incidence of thyroid cancer in the Republic of Belarus before and after Chernobyl

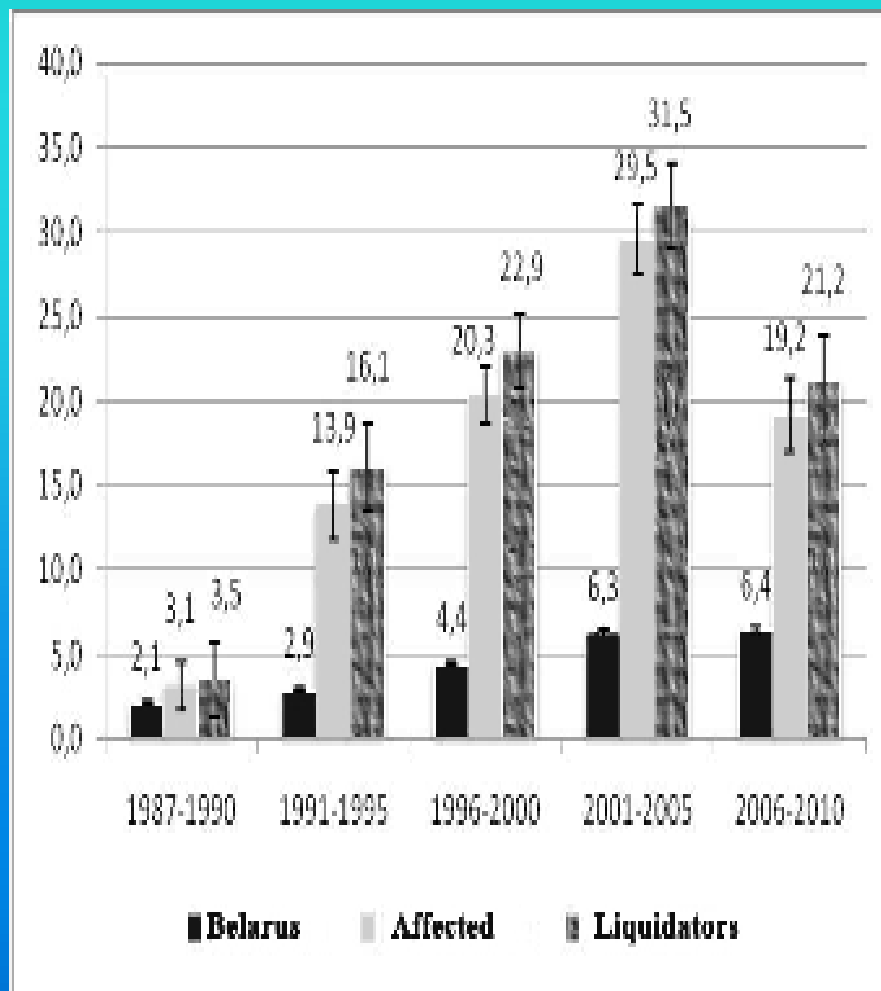


The incidence of thyroid cancer in the Republic of Belarus before and after Chernobyl
(all population 0–85+)

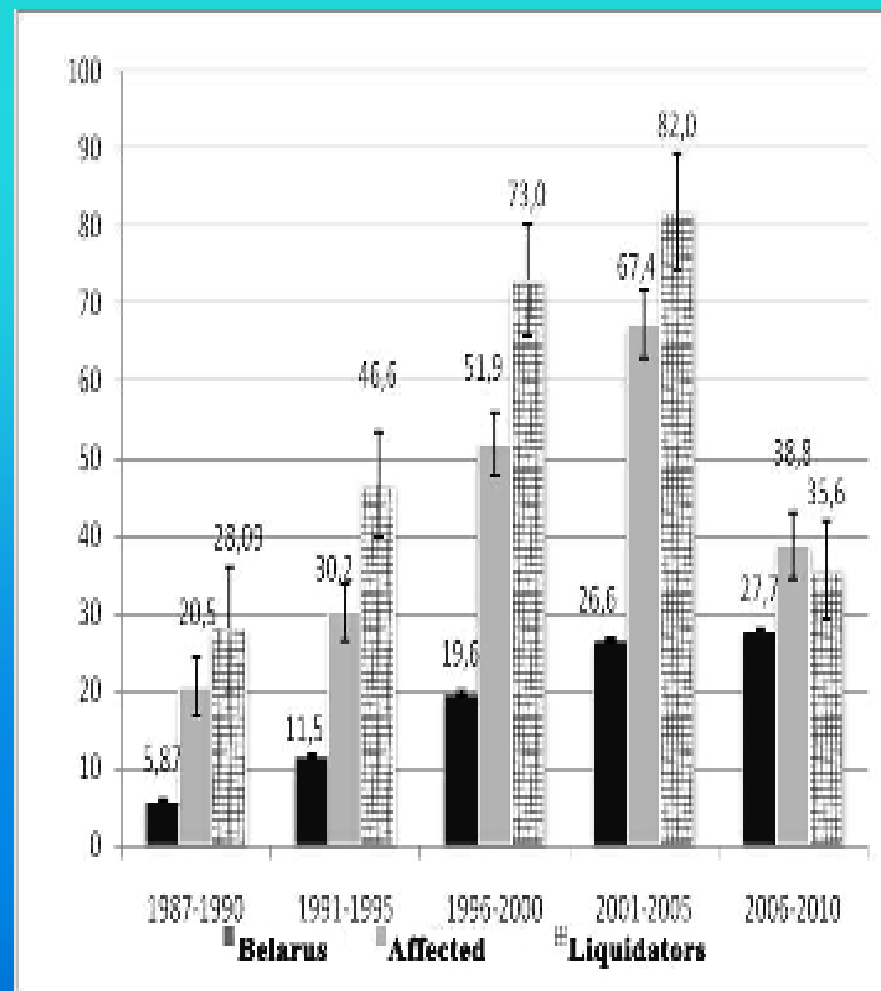


The incidence of thyroid cancer in the Republic of Belarus before and after Chernobyl
(truncated standard World 40 +)

Characteristics of thyroid cancer morbidity among the various categories of the adult population of Belarus (truncated standard World 40 +)

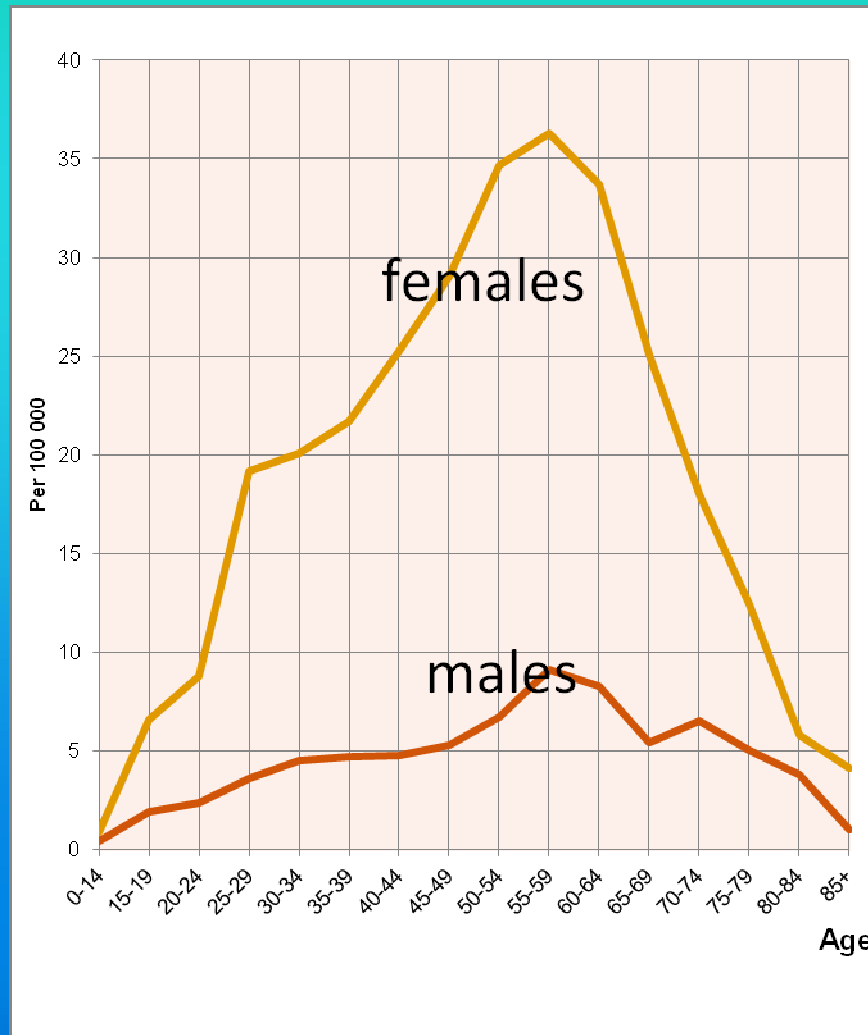


Males

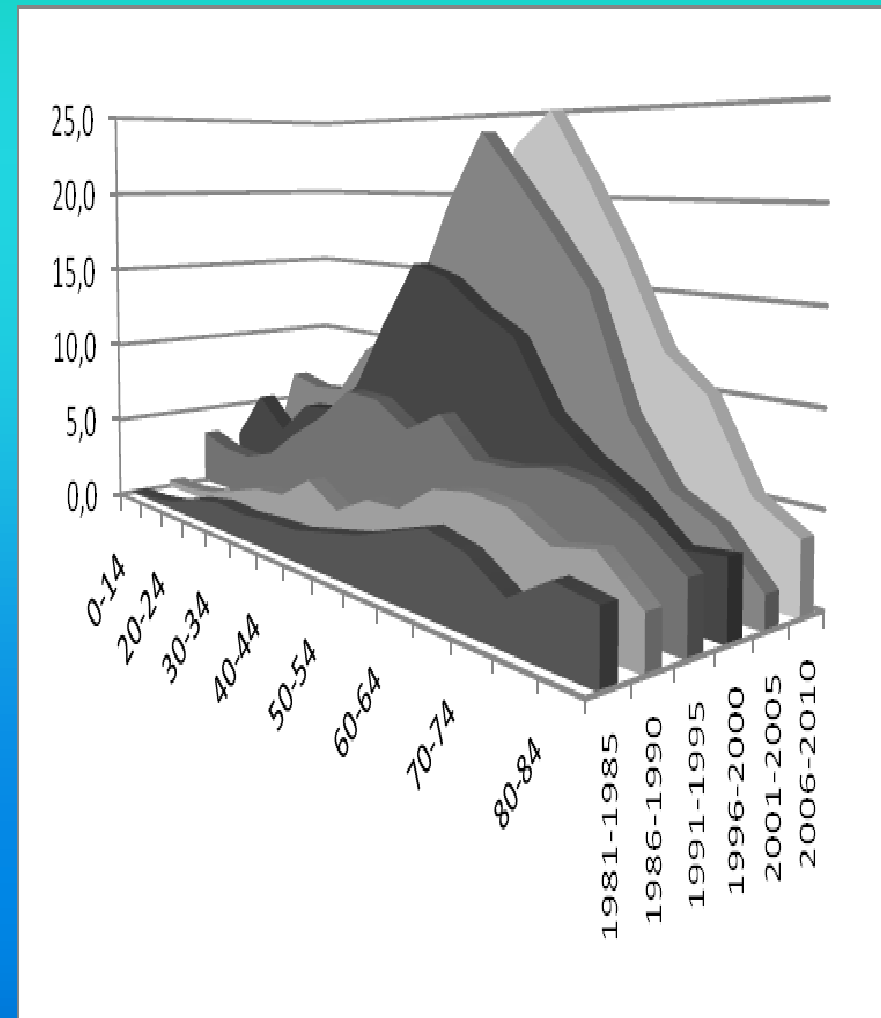


Females

Age incidence of thyroid cancer



2008-2012

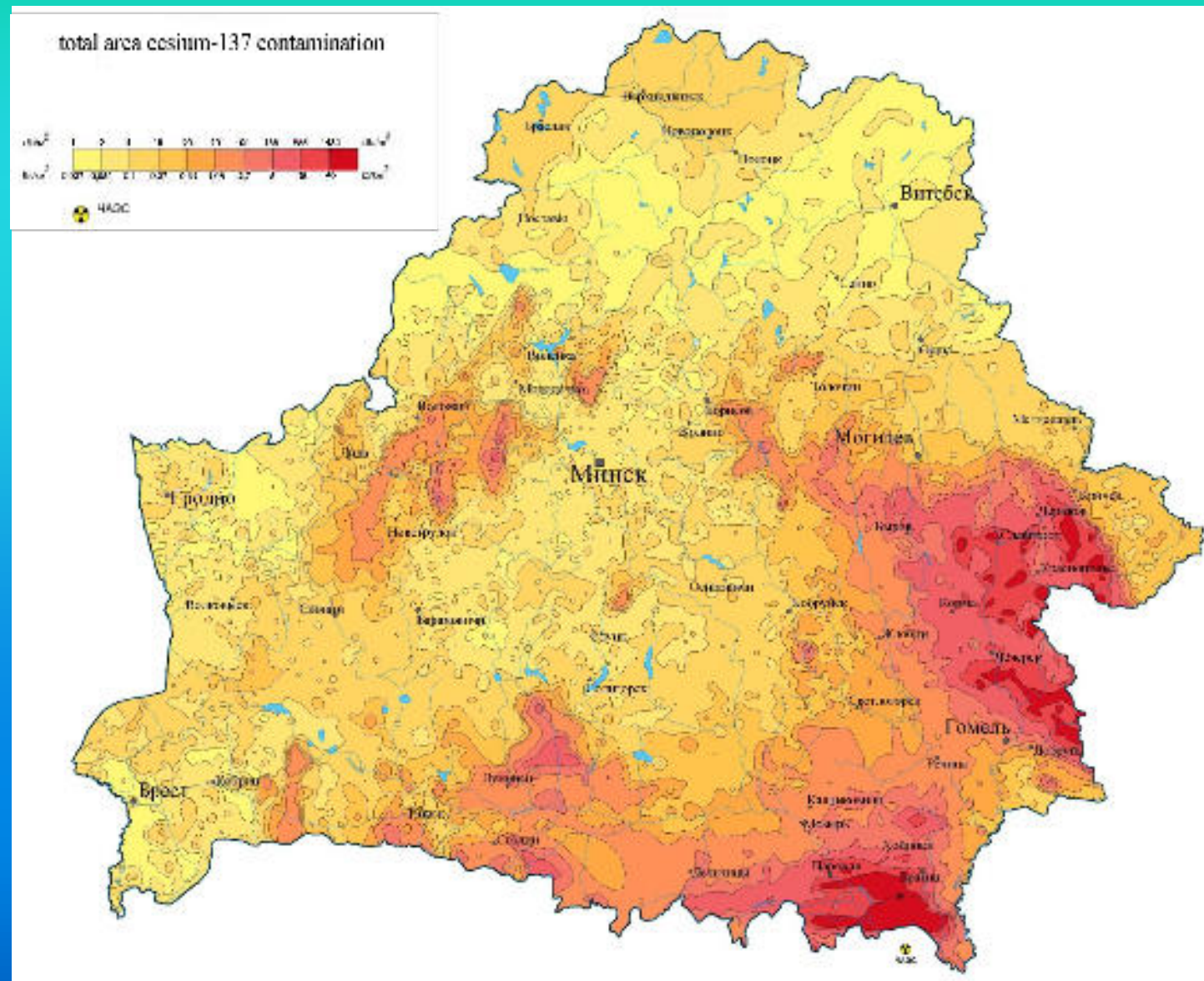


1981-2010

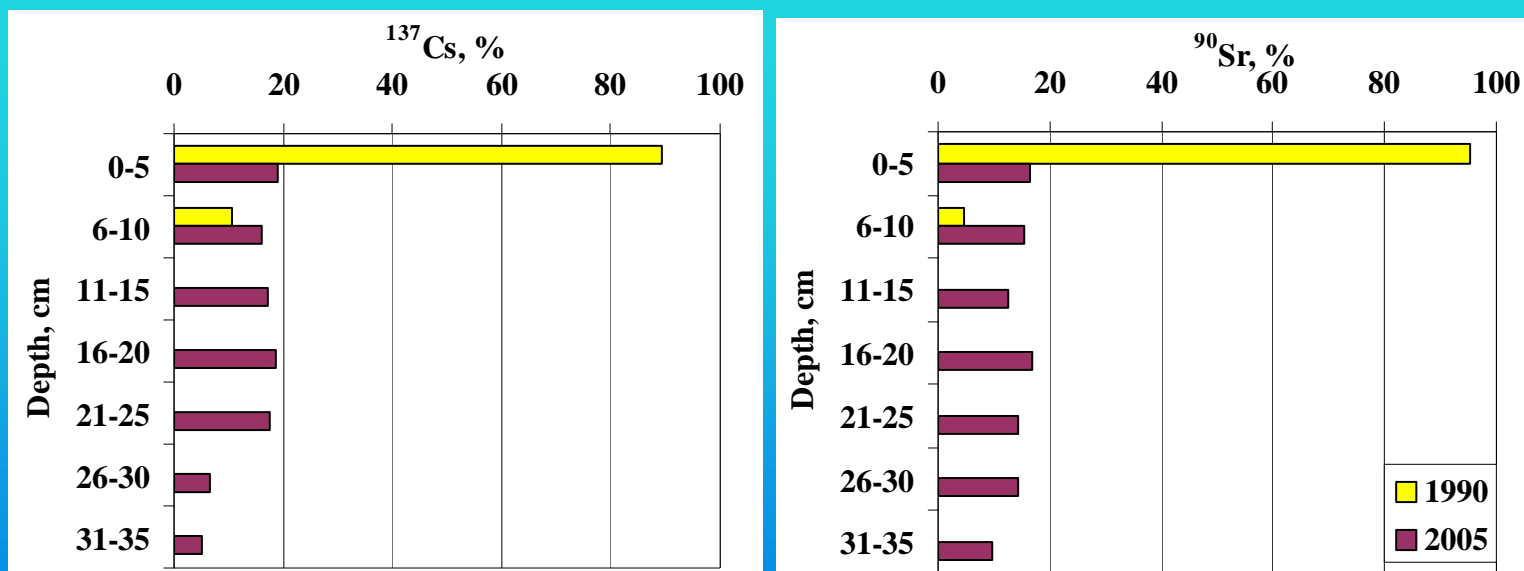
Thyroid cancer incidence in the WORLD

Country	Incidence		
	male	female	both sex
Belarus	4,3	15,2	10,1
Ukraine	1,6	6,9	4,5
Russian Federation	1,7	7,2	4,7
Lithuania	2,2	10,5	6,6
Latvia	1,3	4,5	3,1
Estonia	1,2	7,3	4,5
Poland	1,3	4,0	2,7
Slovakia	1,8	5,6	3,8
Switzerland	2,2	5,7	3,9
France	5,1	15,6	10,4
German	2,6	4,5	3,5
Netherlands	1,3	3,2	2,3
United Kingdom	1,4	4,1	2,8
Denmark	1,7	3,8	2,8
Sweden	1,8	4,3	3,0
Finland	2,2	7,9	5,0
USA	4,6	15,1	9,9
Canada	4,2	14,6	9,4

The contamination of the territory of Belarus with caesium-137 (1986)



Dynamics of ^{137}Cs and ^{90}Sr migration by the profile of non-arable peat-marsh drained low-lying type soils in % of total content (The National Report- 2006)

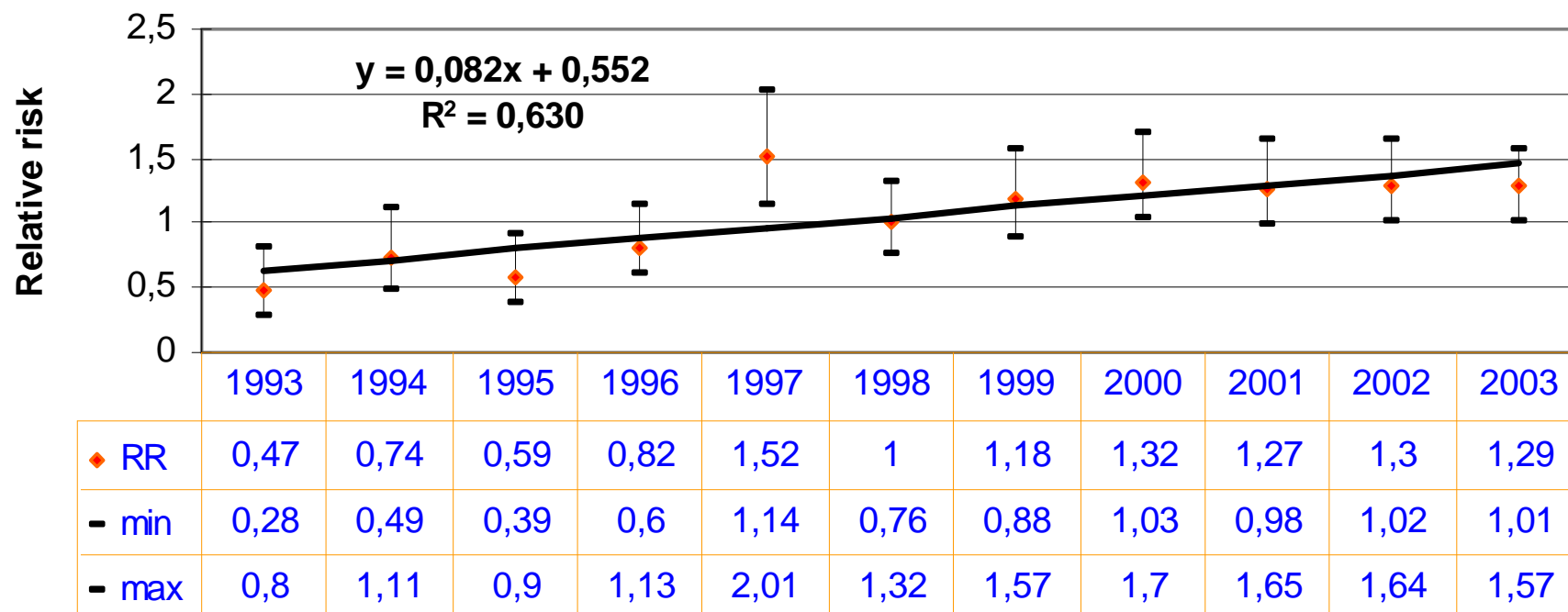




Relative risk of malignant tumors incidence among liquidators for the period of 1997-2003

Tumor site	Incidence rate (TASR*\pmm per 100000)		RR	95% confidential interval	
	Liquidators	Control group		Lower boarder	Upper boarder
All sites	464,6	379,3	1,23	1,18	1,27
Stomach	46,9	40,8	1,15	1,02	1,29
Colon	22,2	16,7	1,33	1,11	1,59
Lung	66,3	52,6	1,26	1,14	1,39
Kidney	19,1	15,4	1,24	1,05	1,47
Urinary bladder	18,7	11,4	1,65	1,37	1,98
Thyroid	32,2	12,3	2,62	2,23	3,07

Dynamics of relative risk of **lung** cancer among Chernobyl liquidators

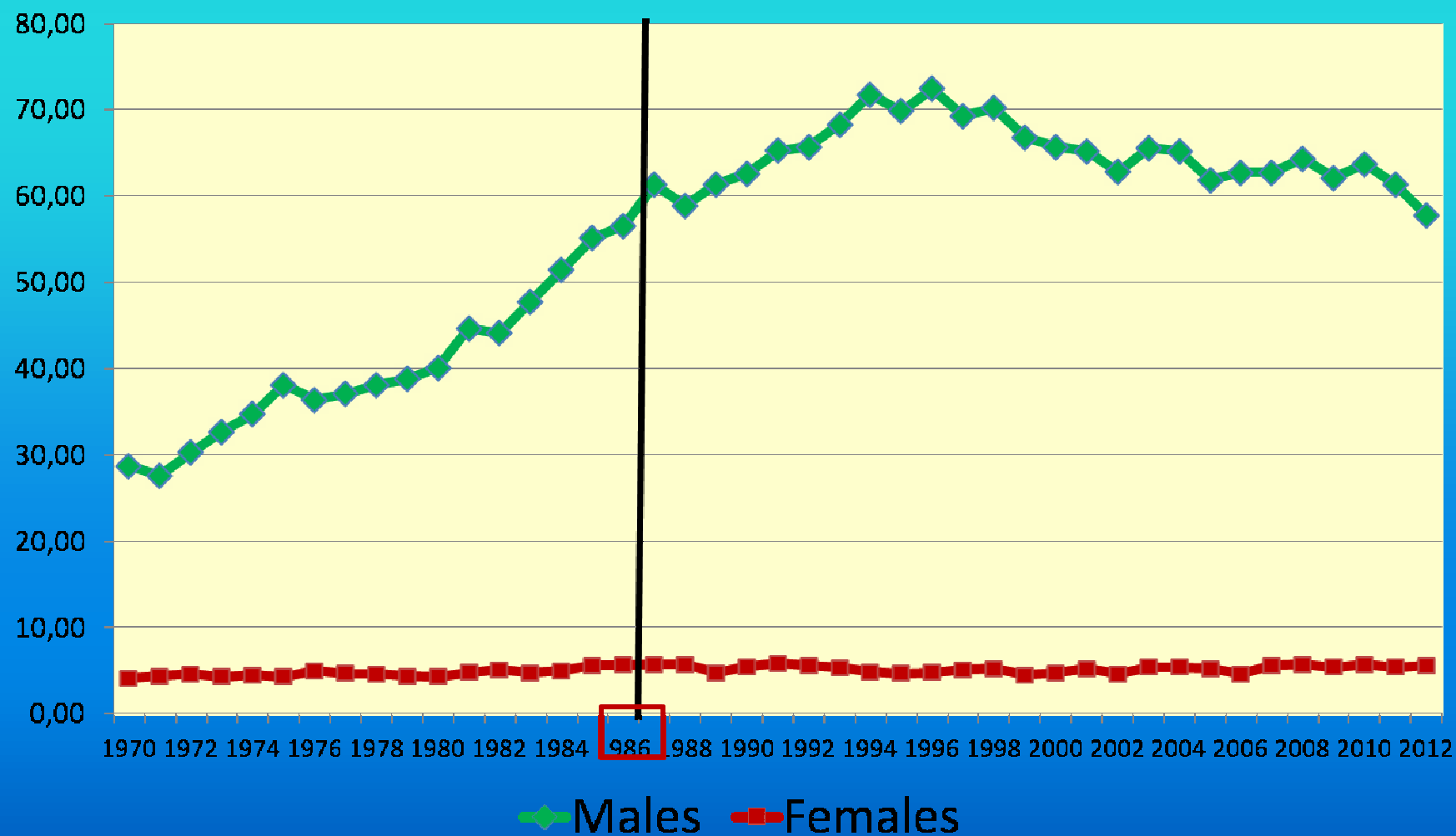


RR 1997-2003 = 1.26

min - 1,14

max - 1,39

Dynamics of lung cancer incidence in Belarus (age-standardized rates)



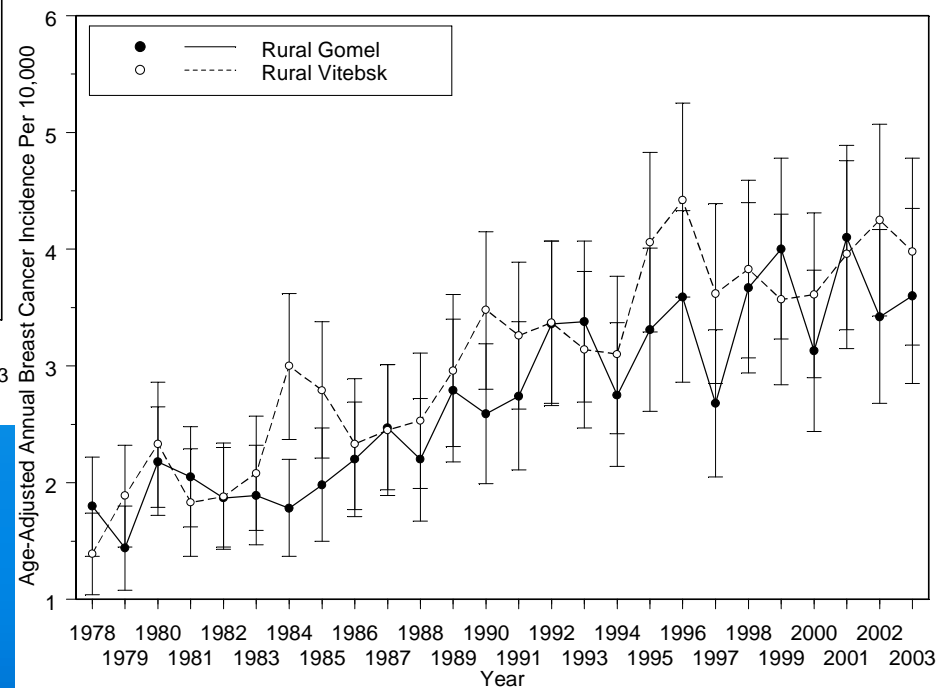
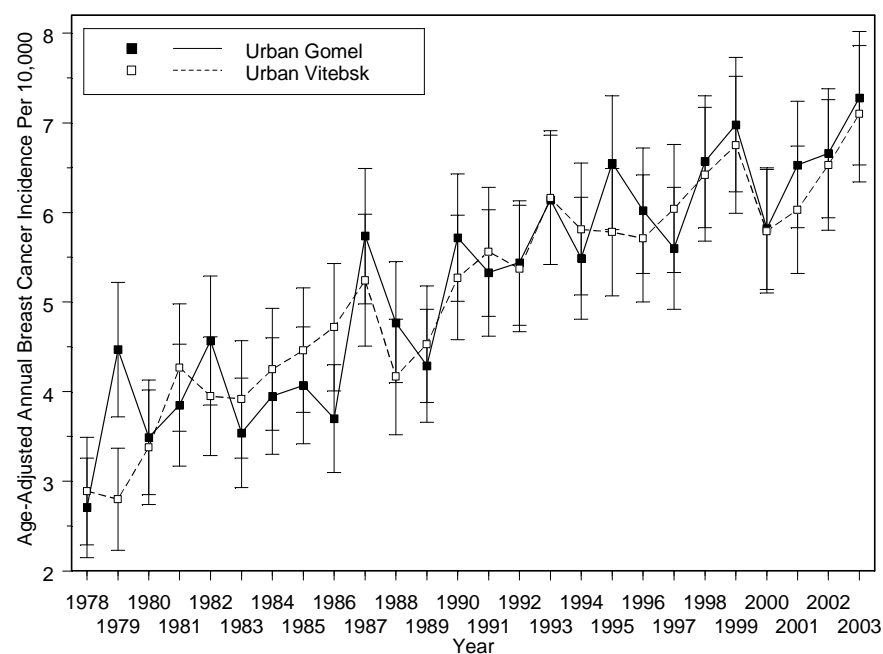
Breast cancer after the Chernobyl accident

Eero Pukkala, Fusra Kesminiene, Semion Polakov et al.

Category	Relative Risk	95% CI
Total 40+,mSv	2,24	1,51 – 3,32
Premenopausal at the time of the accident (mSv)	3,33	1,71 - 6,50

Internally Directly Age-Adjusted Breast Cancer Incidence Rates, 1978-2003, in Urban and Rural Gomel and Vitebsk Oblasts, Republic of Belarus.

(A. Okeanov et al.)



Conclusions

1. Chernobyl disaster created in Belarus many serious long-term problems affecting the vital interests of millions of people in parts of the state of health, lifestyle , welfare , conditions of employment.
- 2 . Over the past few years after the accident, the main part of the population has already received 80 % of the dose of their anticipated life . However, people who was born after 1990, the formation of doses will be continue throughout the life expectancy , due to both external and internal exposure (consumption of contaminated food).
- 3 . The doses have been received by the population in the early period of the accident due to iodine-131 , determine the radiation -induced increase in the incidence of thyroid cancer in exposed in childhood and adolescence. Increase of the incidence is being observed among liquidators and adults . Scientists forecast increase of incidence about 15 thousand cases of thyroid cancer in the during of following 50 years.
- 4 . Other stochastic effects of irradiation has not revealed fully yet of the longer latency period and the chronic nature of exposure to low doses of powerful . For some of the most exposed groups of survivors significantly is marked trend of increasing frequency of other cancers. Made forecast point the possibility of increasing the incidence of a few percent in the during the life of the victims. To evaluate the detection of the radiation factor in a possible increase in cancer incidence is necessary to hold carefully planned long-term radiation-epidemiological studies.

Conclusions

Thyroid cancer

- The growth of incidence has been growing among irradiated by radioiodine since the Chernobyl accident
- The rates of incidence among females exceeds 4 times than among males
- The last decade the growth of incidence was determined mainly due to the females population
- It has been observed the insufficiently low detection of diseases at the early stages
- Long term results of treatment has been reached.
- With the purpose of improving early diagnosis is required widespread organization ultrasound - screening of thyroid gland by fine-needle biopsy of the nodes
- Group of risk:**
 - women from 30 to 75 years , living in Belarus from April 26 till July 1, 1986 ;
 - Liquidators (both sexes);
 - Evacuees (both sexes)



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Thank you !

We are always ready for collaboration