

French-German Initiative - Health Project

SOLID CANCER AND THYROID CANCER IN CONTAMINATED TERRITORIES OF RUSSIA

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Project 3
Health Effects of the Chernobyl Accident

SUB-PROJECT 3.1.3.S

**THYROID CANCER IN ADOLESCENTS AND ADULTS IN
THE MOST AFFECTED TERRITORIES OF RUSSIA
AFTER THE CHERNOBYL ACCIDENT**

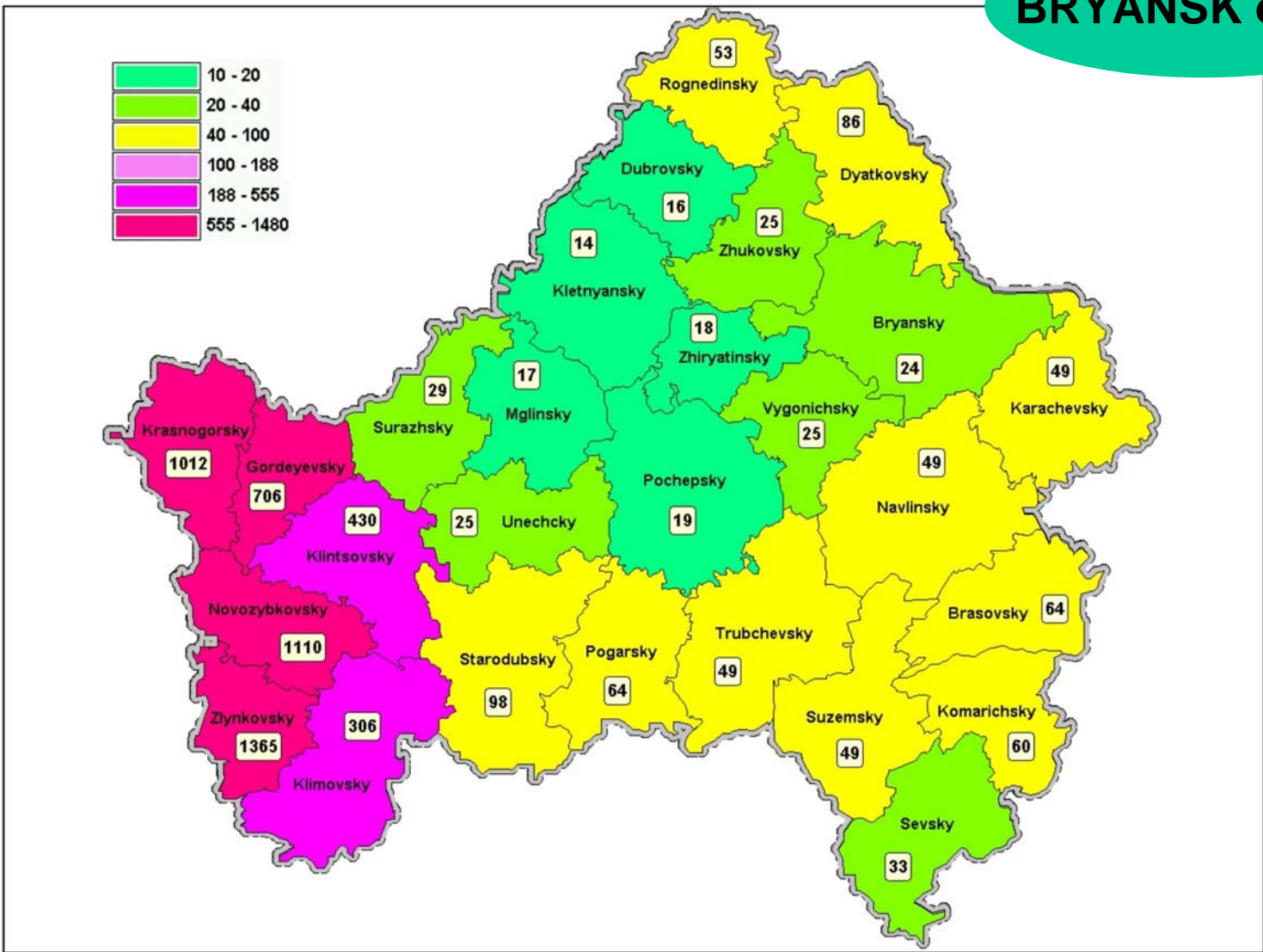
FGI – Kiev 6th October 2004

AIMS OF THE SUBPROJECT

- reconstruction of thyroid cancer incidence rates in adolescents and adults in the **Bryansk and Orel** oblasts of Russia; study period: 1982-1999;
- support of registration activities for thyroid cancer in the affected regions and evaluation of the validity of collected data;
- descriptive analysis of the collected data (geographical comparisons, time trend analysis, characteristics on a raion level);
- preparation of progress and final reports and scientific publication.

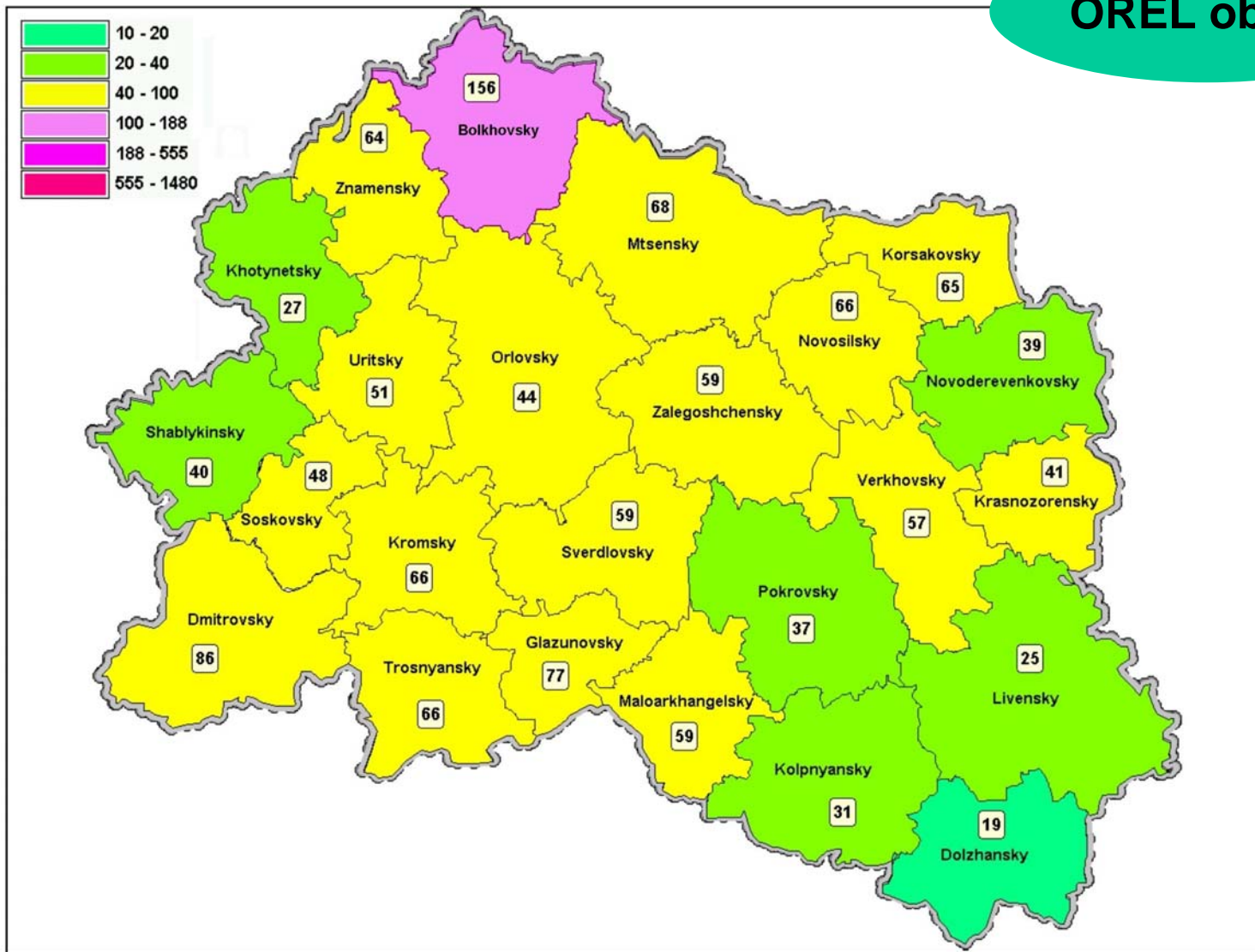
AVERAGE VALUES (kBq/m²) OF CONTAMINATION WITH ¹³¹I

BRYANSK oblast



AVERAGE VALUES (kBq/m²) OF CONTAMINATION WITH ¹³¹I

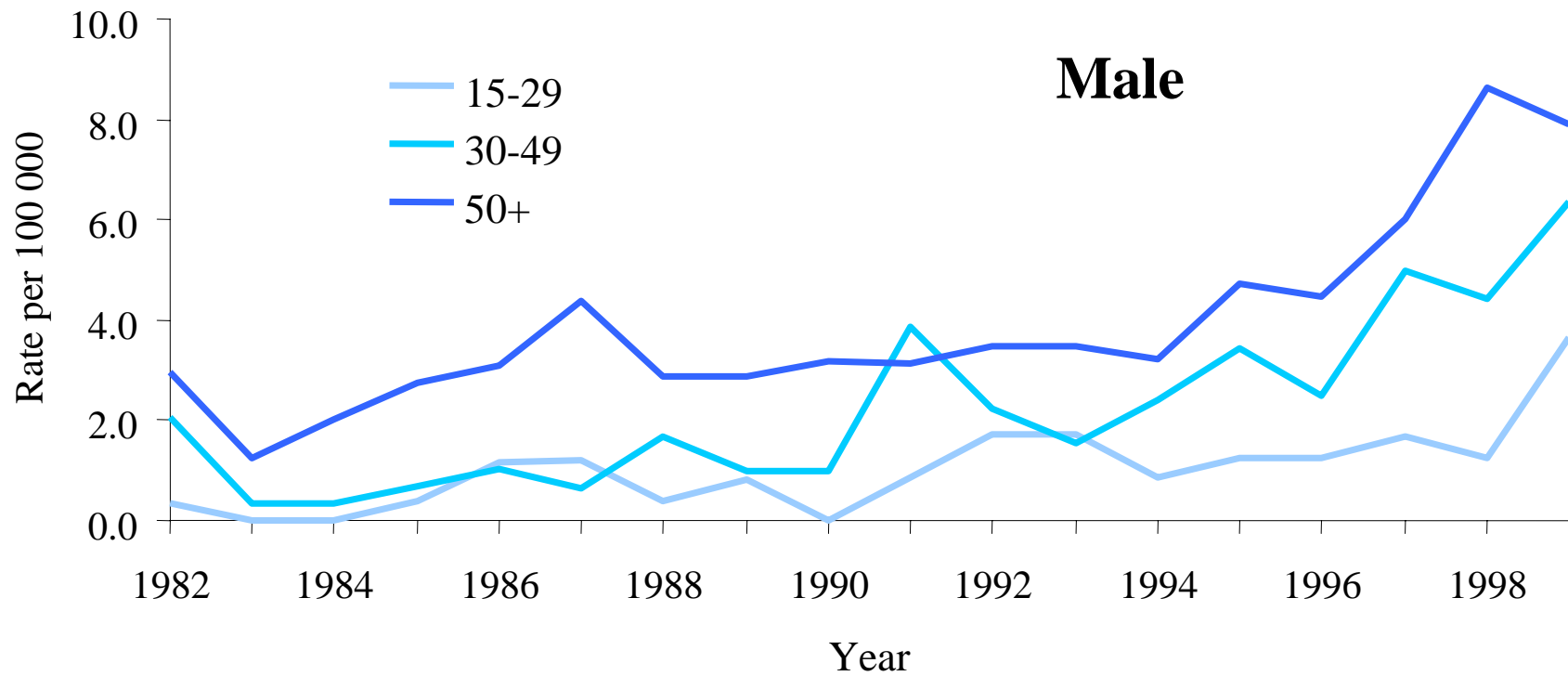
OREL oblast



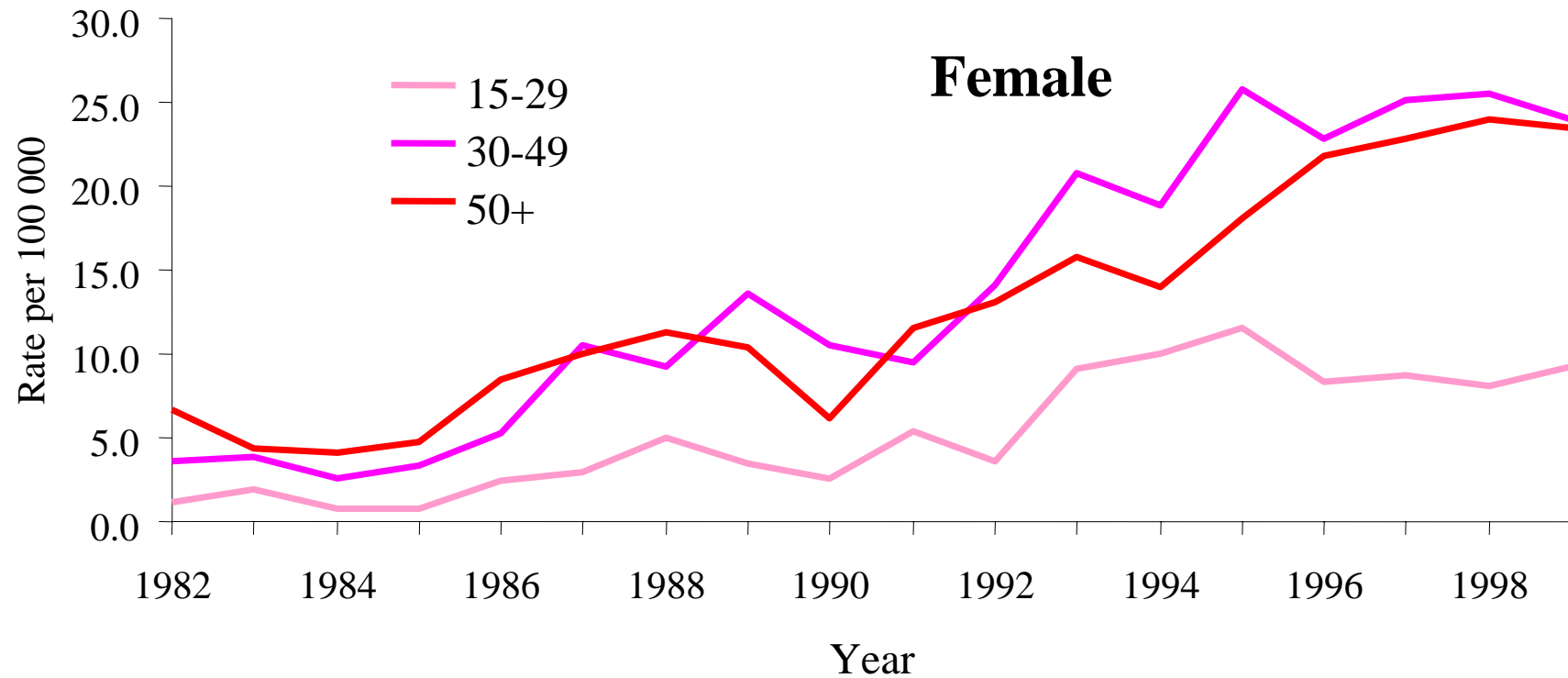
NUMBER OF REGISTERED IN 1982-1999 THYROID CANCER CASES IN BRYANSK & OREL OBLASTS.

SEX	REGION	BRYANSK	OREL	TOTAL
MALE		226	145	371
FEMALE		1272	895	2167
TOTAL		1 498	1 040	2 538

THYROID CANCER INCIDENCE RATES AS A FUNCTION OF AGE AT DIAGNOSIS

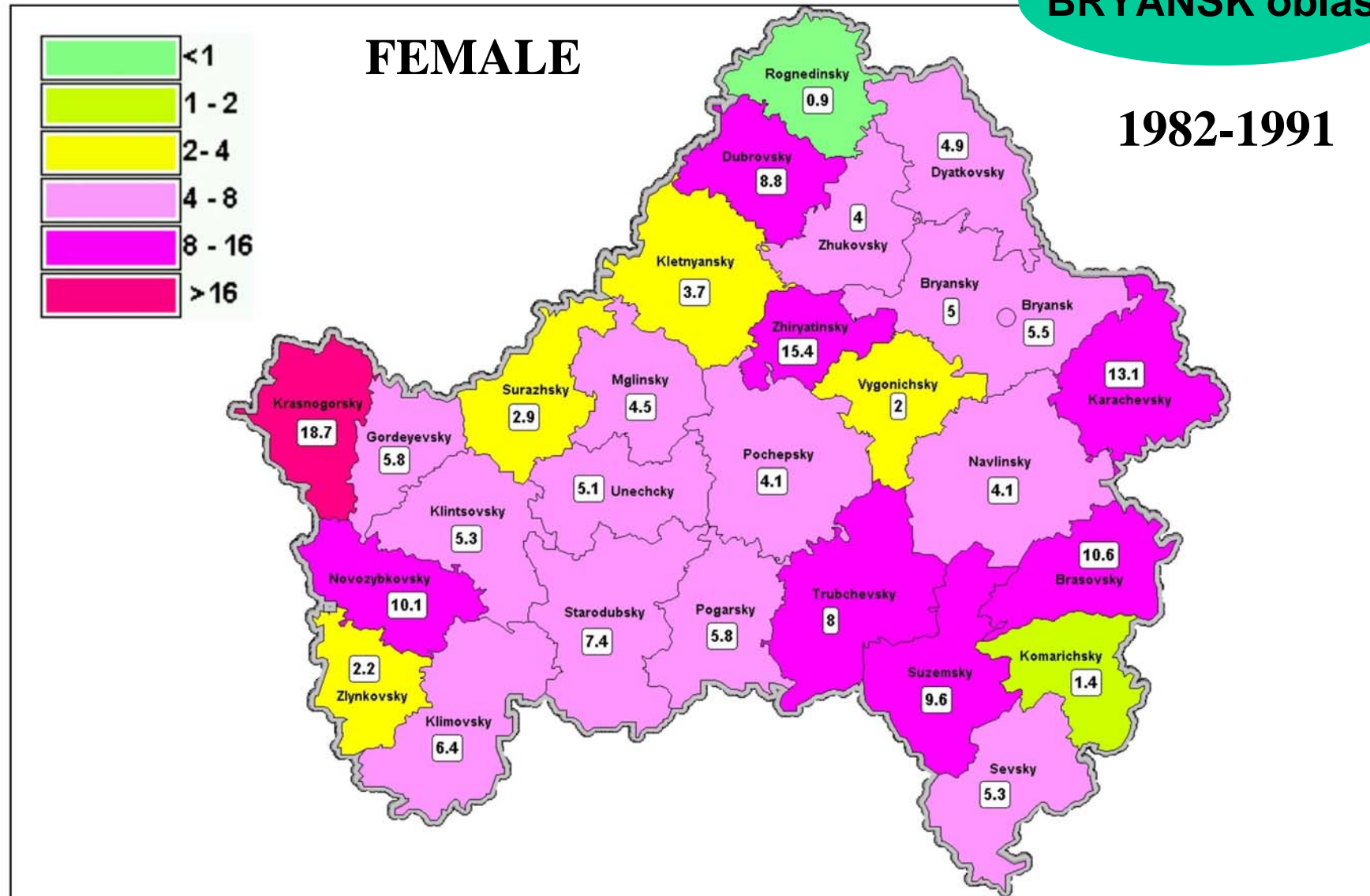


THYROID CANCER INCIDENCE RATES AS A FUNCTION OF AGE AT DIAGNOSIS



STANDARDIZED INCIDENCE RATES (PER 100 000) OF THYROID CANCER

BRYANSK oblast

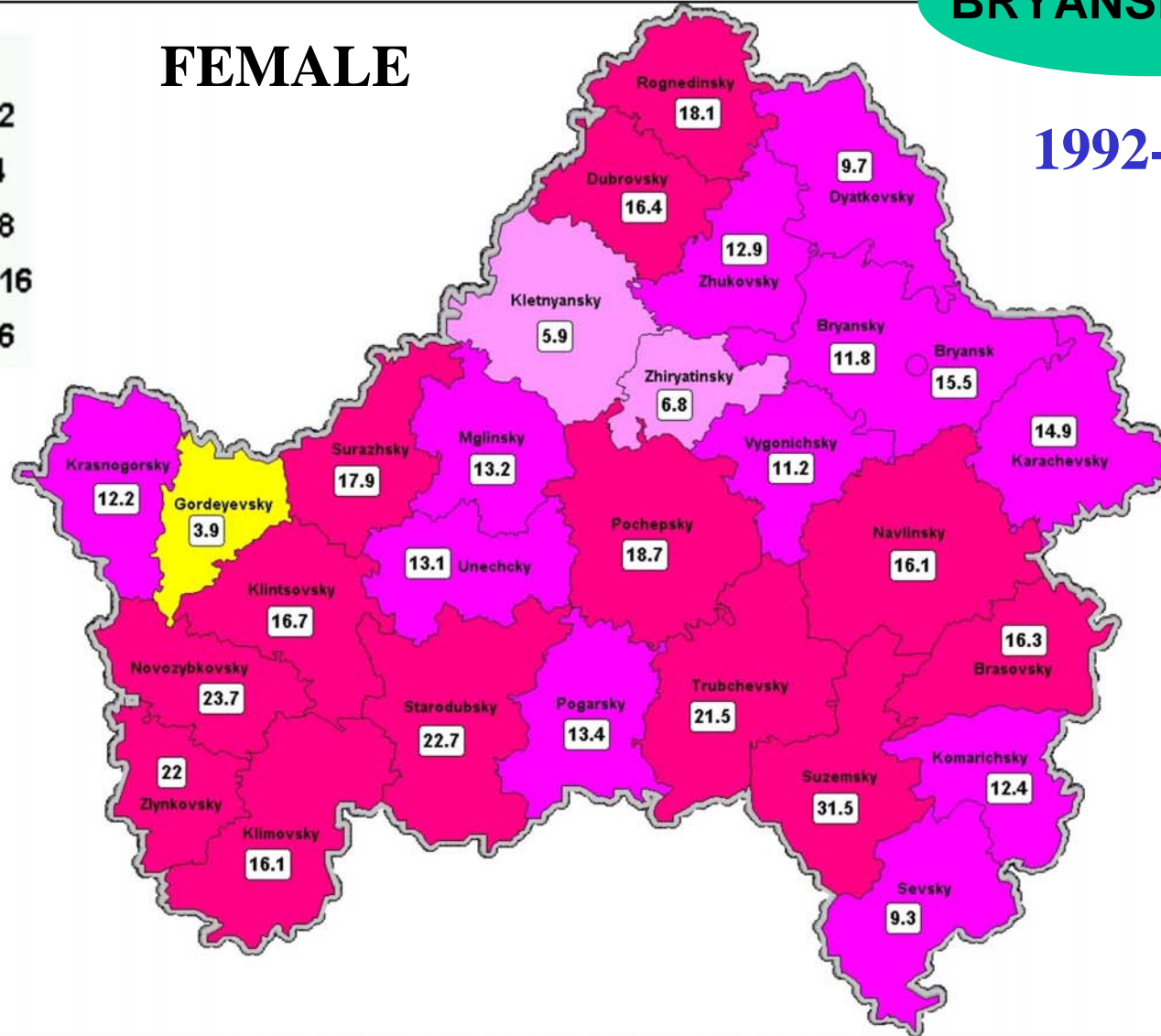


STANDARDIZED INCIDENCE RATES (PER 100 000) OF THYROID CANCER

BRYANSK oblast

1992-1999

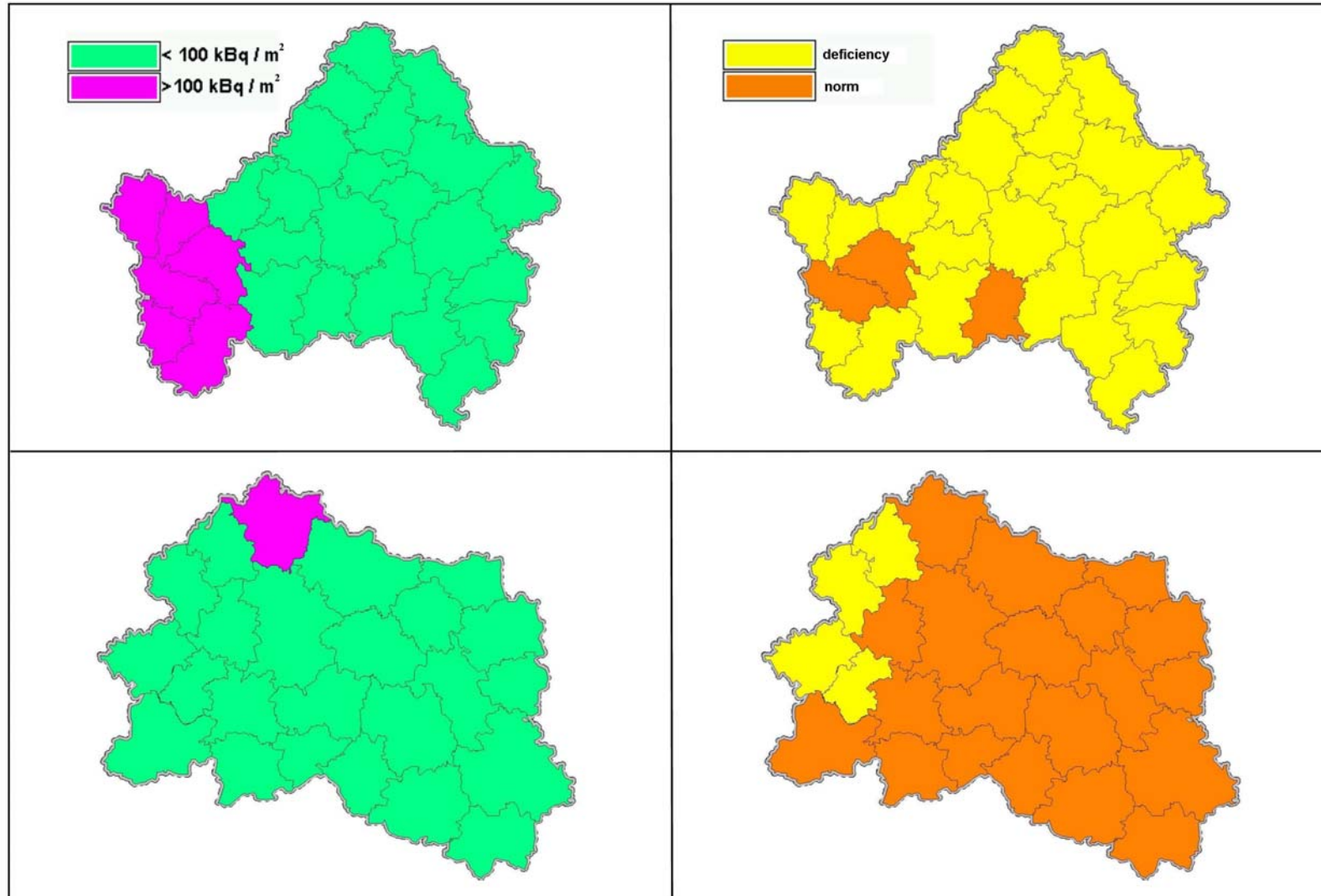
FEMALE



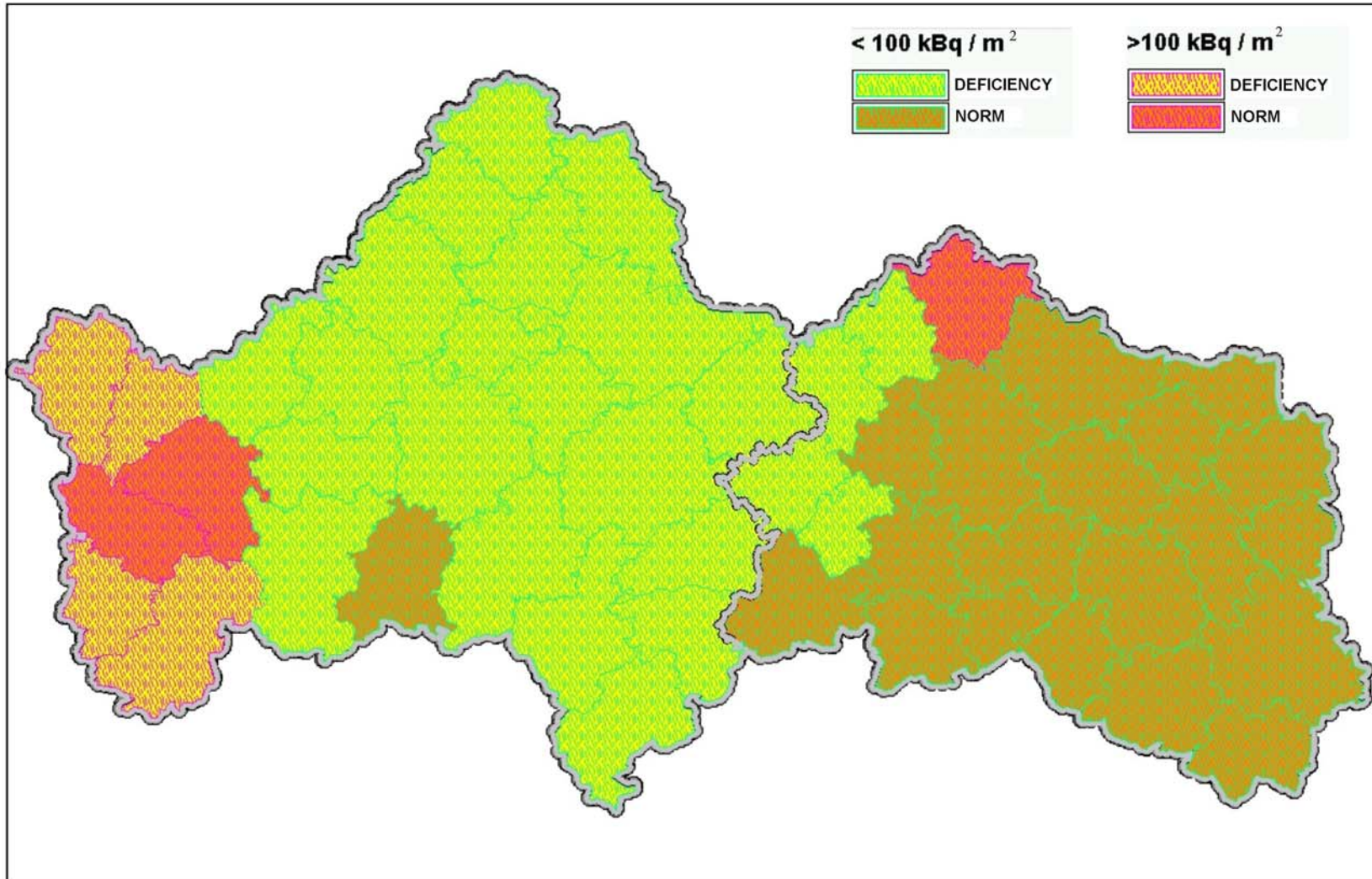
RAIONS INCLUDED IN ANALYSIS

The levels of Iodine -131 contamination




The levels of stable Iodine in soils



COMBINED MAP



P-VALUES OF TESTING OF NULL HYPOTHESIS - RELATIVE RISK IS 1

Sex Period	Both		Male		Female	
82-91	0.67	<0.01	0.68	0.94	0.40	<0.01
		0.10		0.65		0.12
92-99	<0.01	<0.01	0.08	0.46	<0.01	<0.01
		<0.01		0.05		<0.01

RISK ESTIMATION FOR THE ADOLESCENTS AND ADULTS (AT THE TIME OF ACCIDENT)

BRYANSK OBLASTS

Age at exposure	15-29	30-44	>45	15-69
Females				
Cases	153	215	287	655
Size of population	153 529	139 915	260 147	553 592
ERR	5.81 0.63, 12.5	3.06 -0.70, 7.8	-2.42 -4.15,-0.23	-0.92 -2.35, 0.76
Males				
Cases	20	39	55	114
Size of population	154 019	146 142	185 449	485 610
ERR	15.91 -0.26, 45.4	2.92 -2.75, 12.79	-1.96 -3.89,2.32	0.74 -2.32, 5.20



Project 3

Health Effects of the Chernobyl Accident

SUB-PROJECT 3.1.3.

SOLID CANCER INCIDENCE AMONG THE POPULATION OF THE MOST HIGHLY CONTAMINATED TERRITORIES OF RUSSIA

TARGETS OF THE ACTIVITIES

- collection of data on solid cancer incidence rates in the population of the most contaminated areas of **Bryansk and Kaluga oblasts** of Russia; study period: 1980-1998;
- epidemiological analysis of the collected data;
- radiation risk assessment;
- preparation of progress and final reports in co-operation with Western partners.

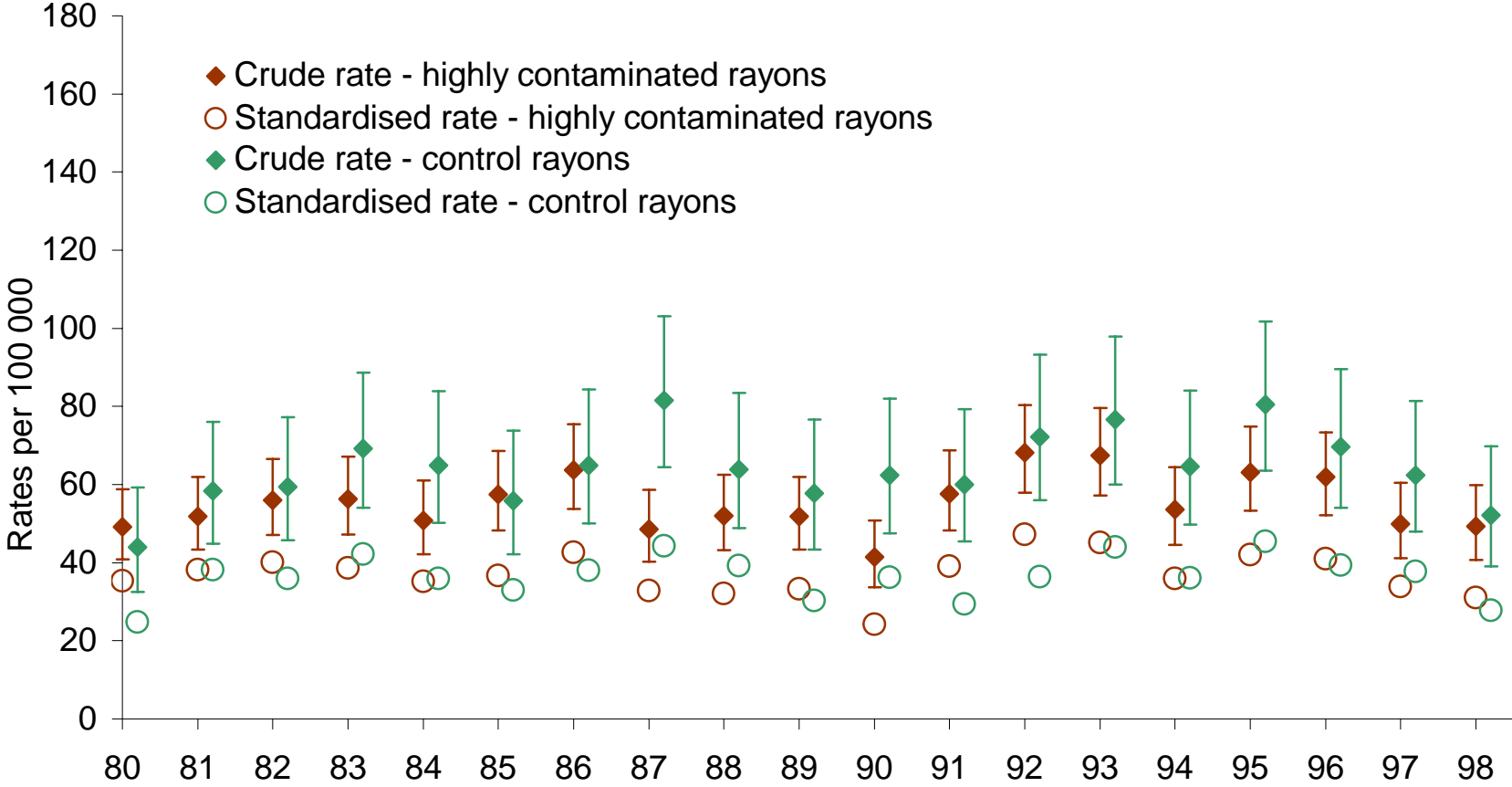
STUDY AREA

	¹³⁷ Cs, kBq/m ²	mean annual population, x10 ³	mean effective dose, mSv
Highly contaminated	>400	222.6	22.9
Control	<200	88.4	3.9

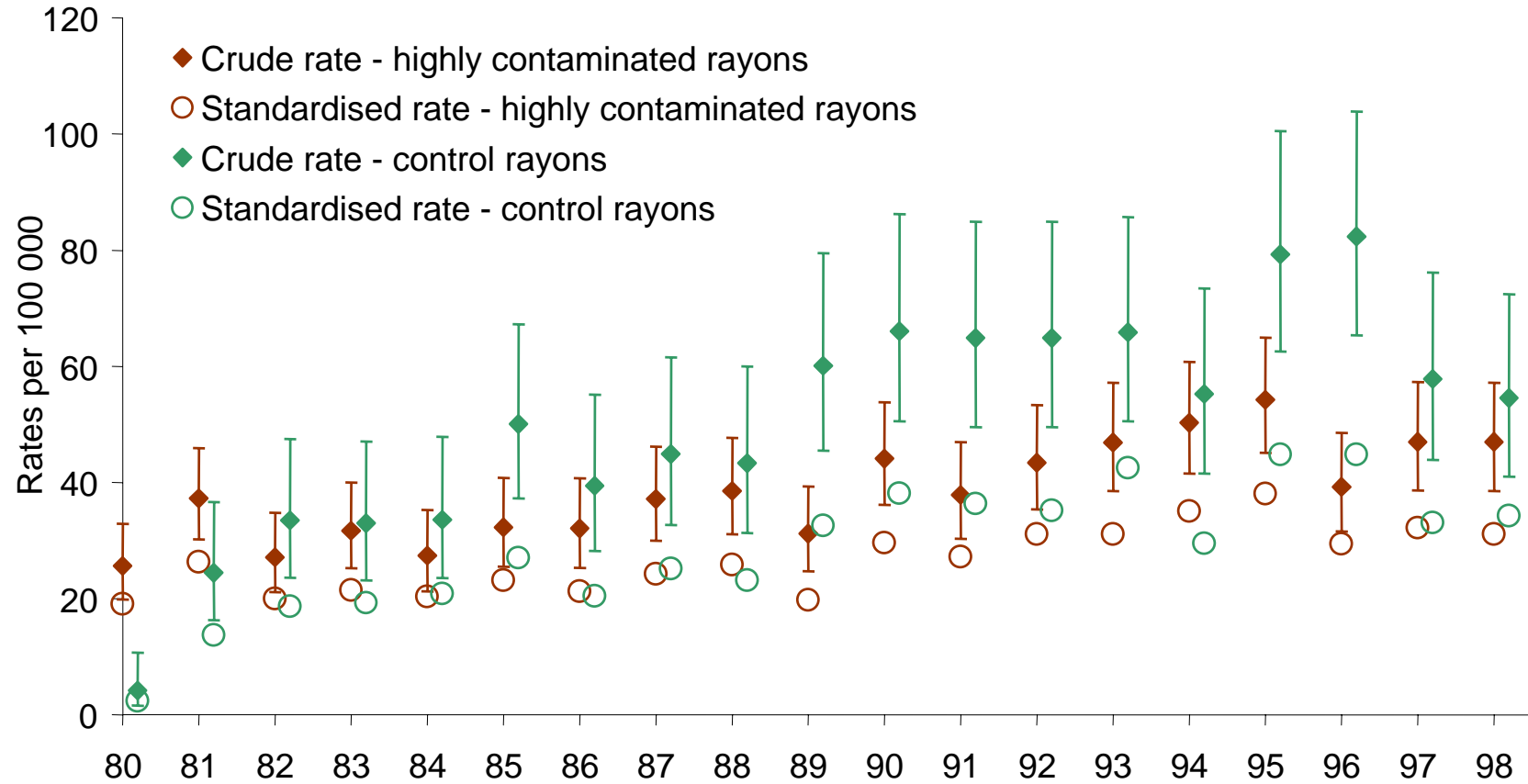
CANCER CASES OVER ENTIRE STUDY PERIOD 1980-1998

	Stomach	Colon	Lung	Breast
Highly contaminated	2 287	418	1 579	777
Control	1 055	176	818	301

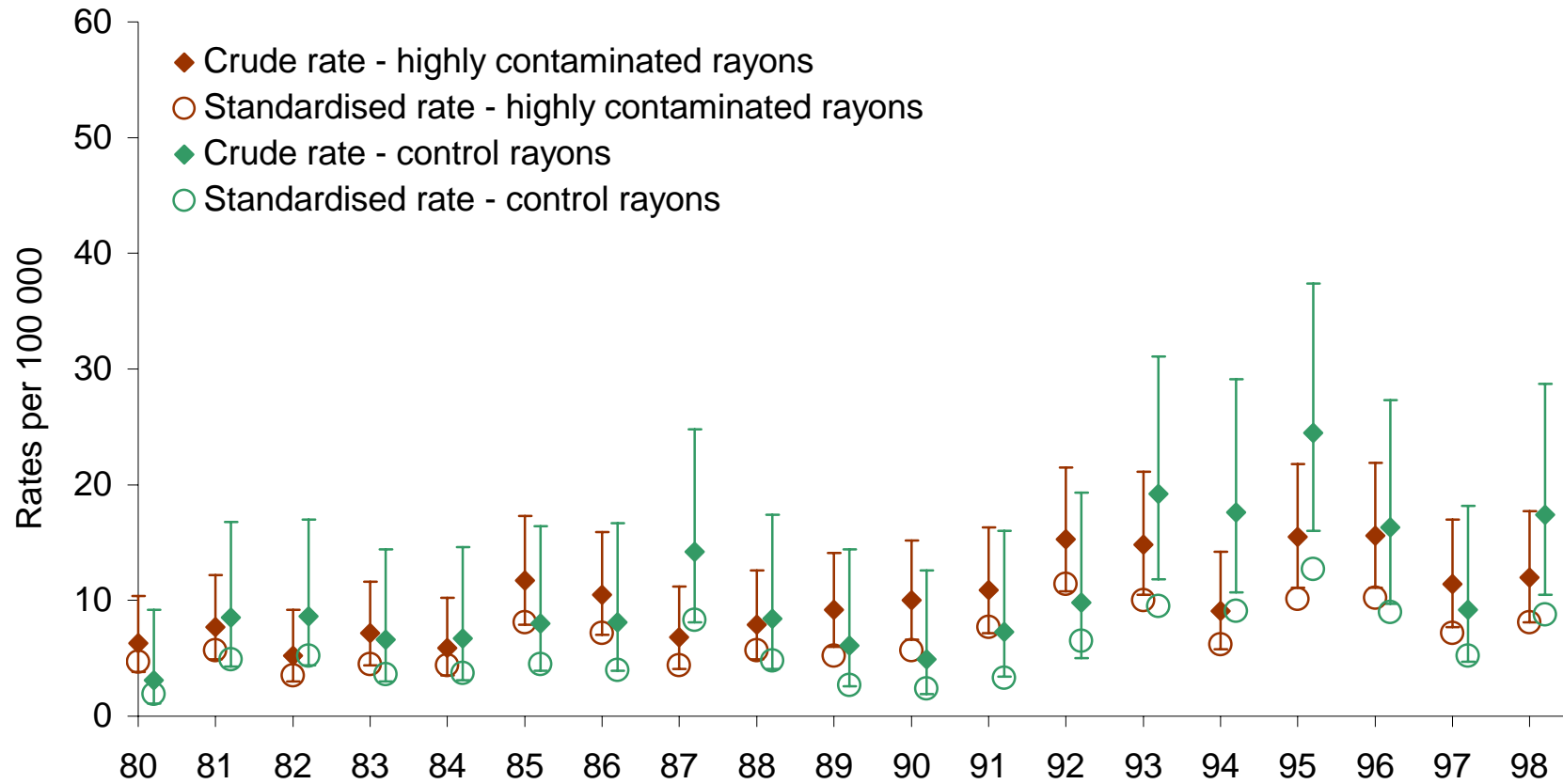
STOMACH CANCER INCIDENCE RATES



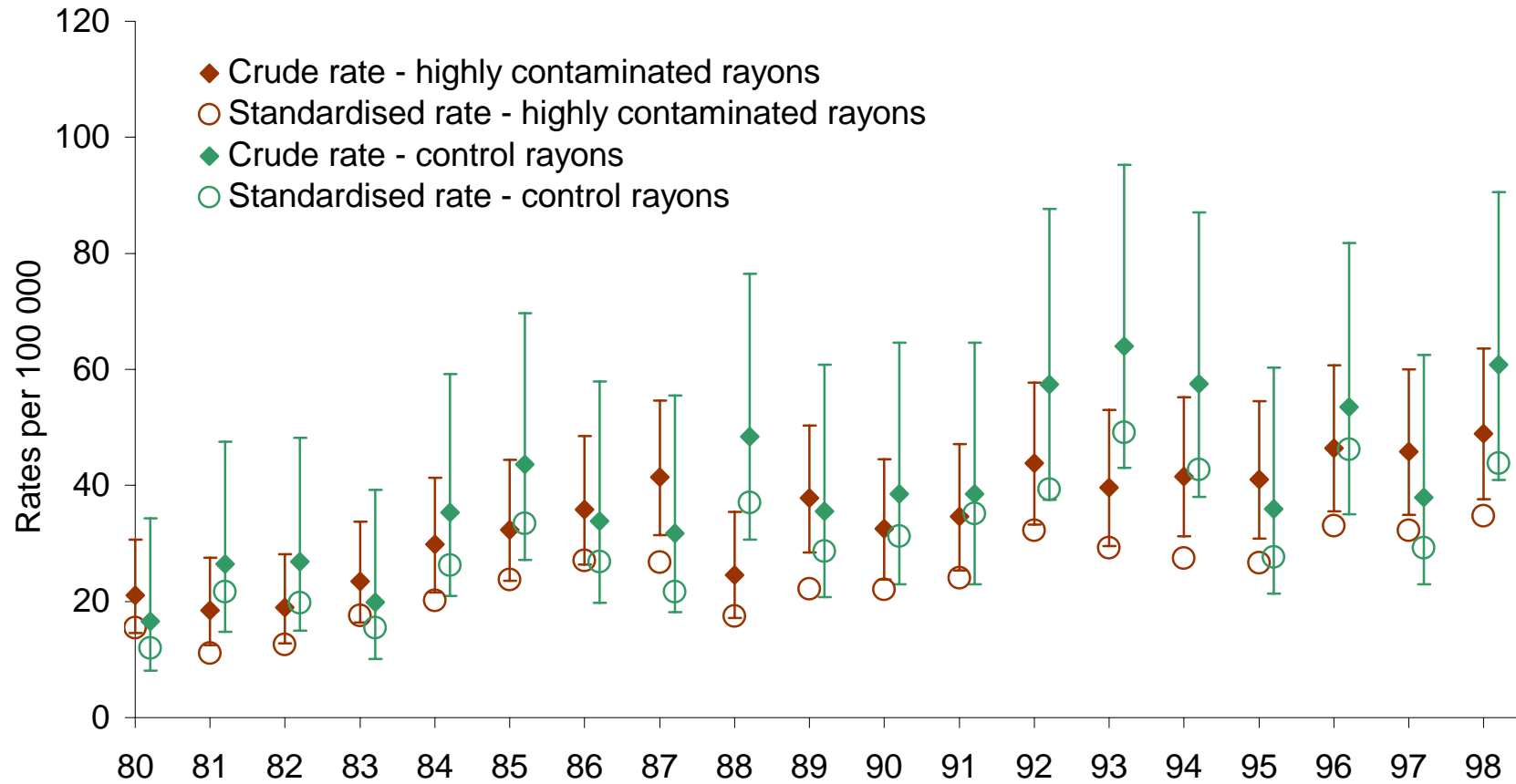
LUNG CANCER INCIDENCE RATES



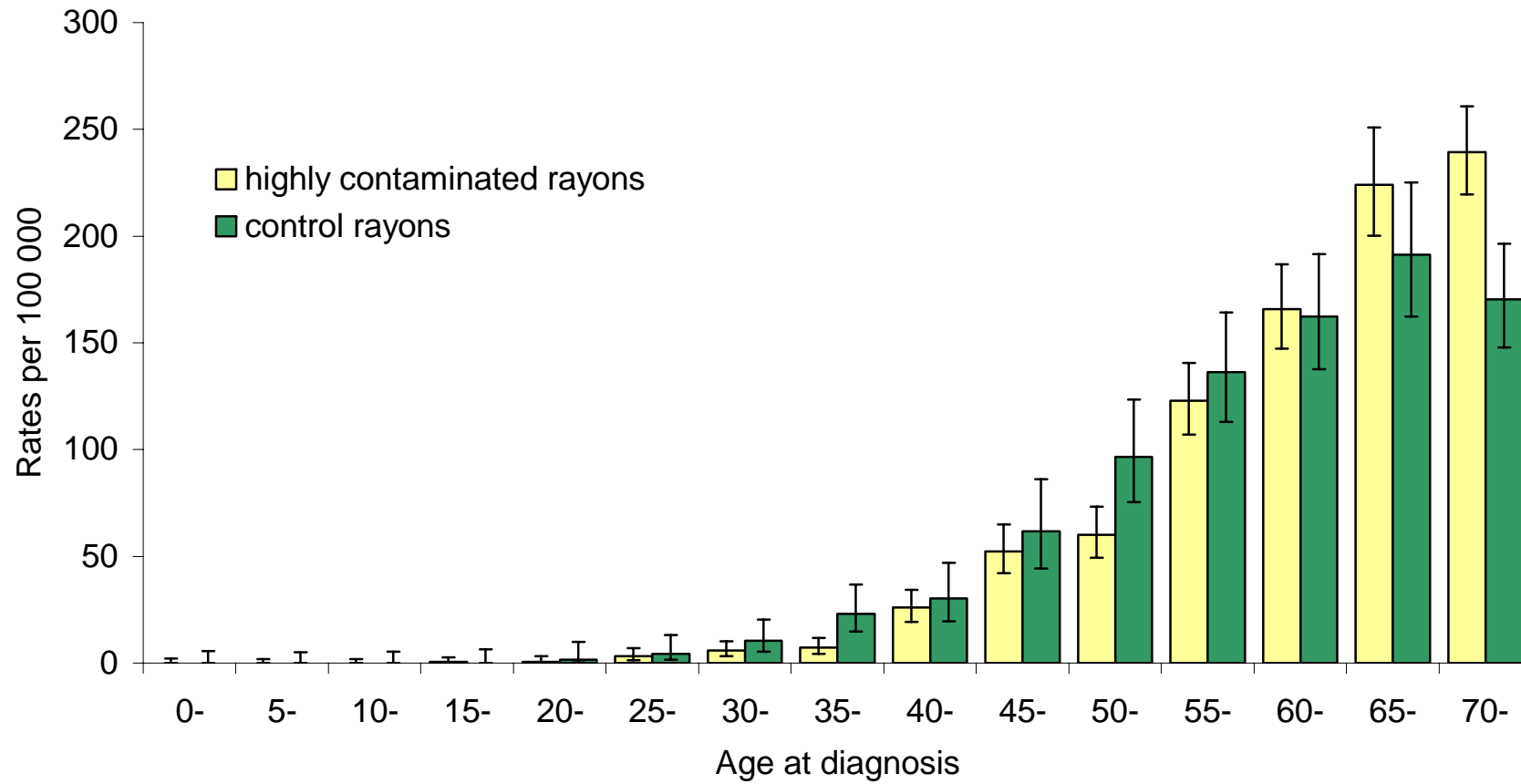
COLON CANCER INCIDENCE RATES



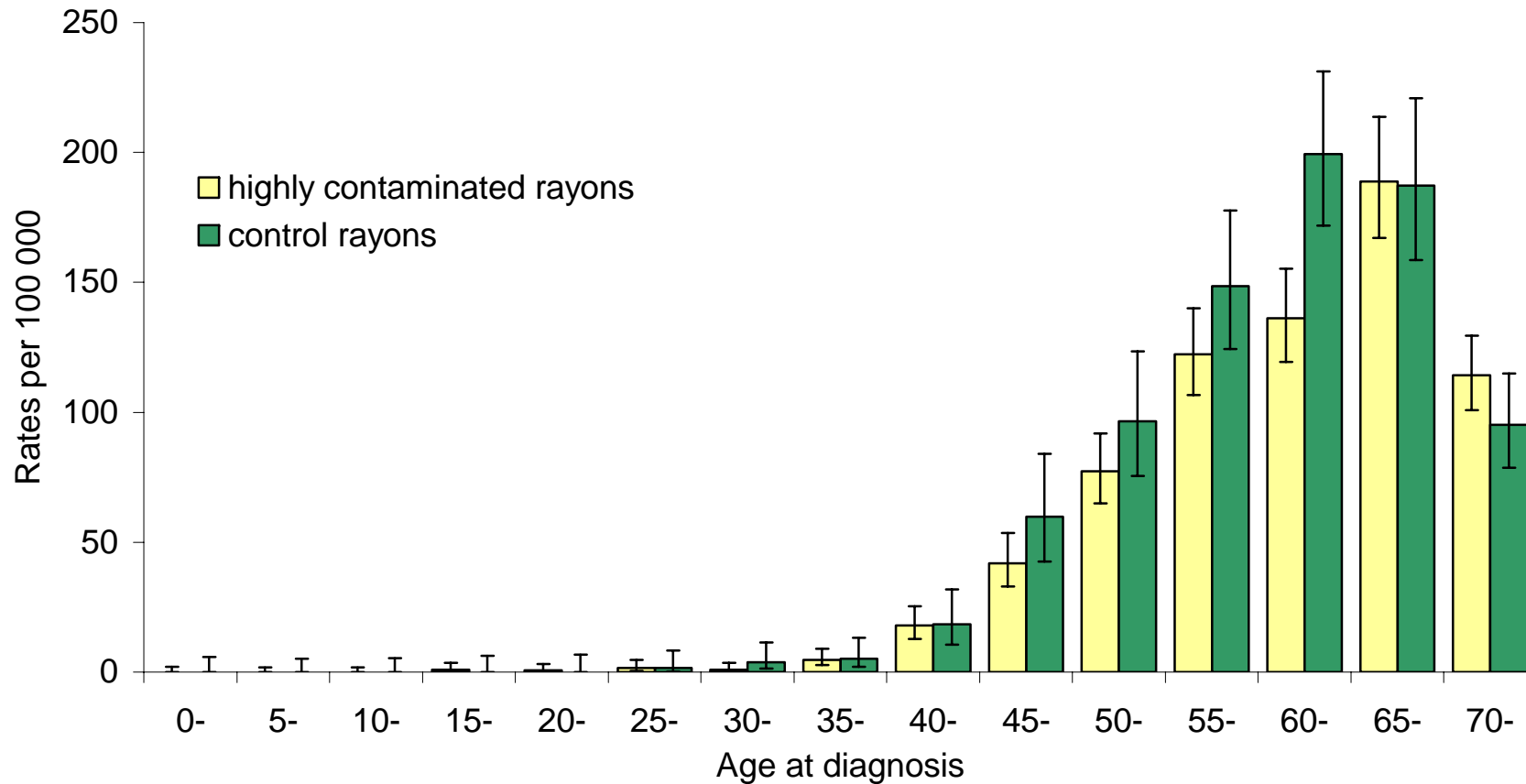
FEMALE BREAST CANCER INCIDENCE RATES



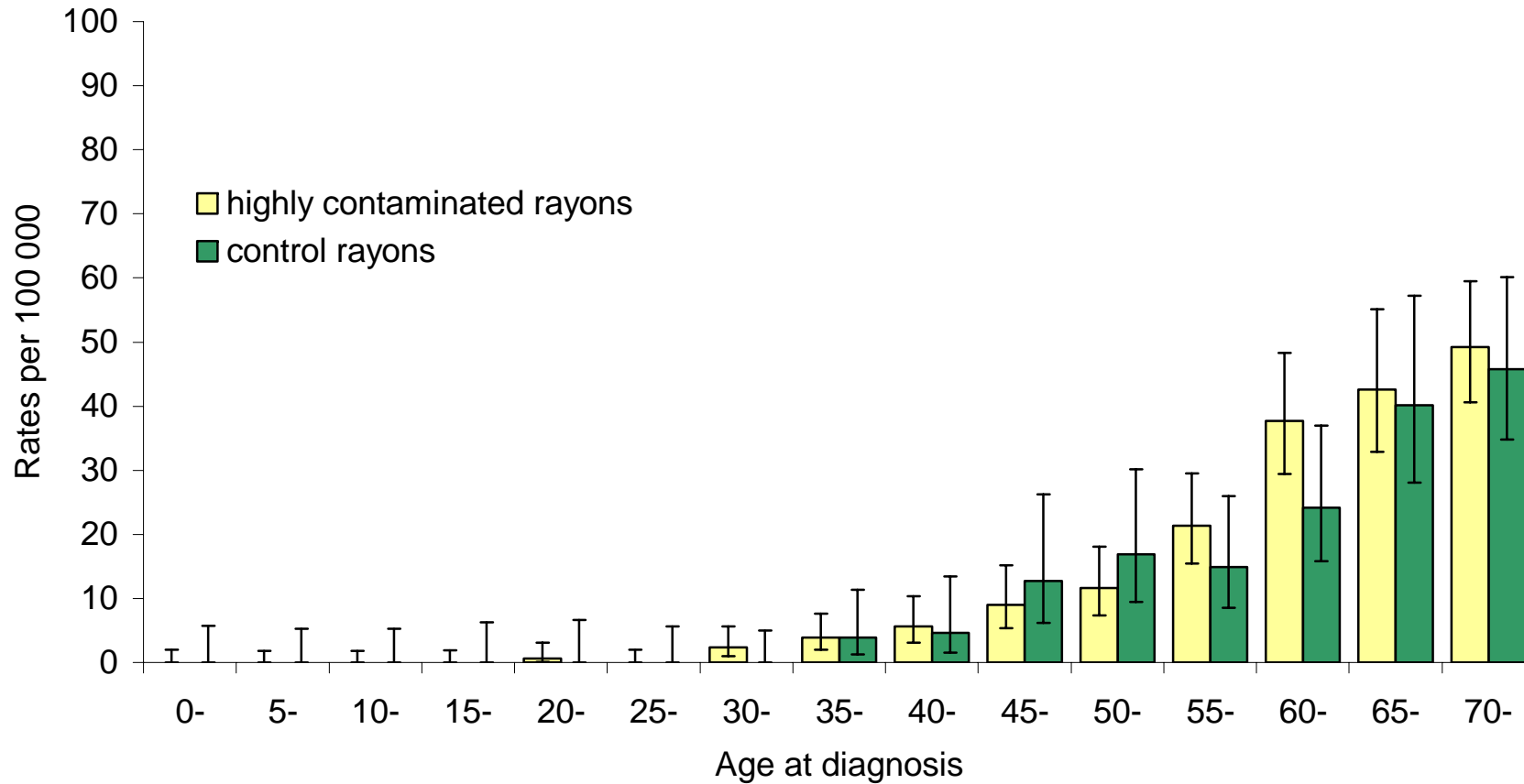
STOMACH CANCER AGE-SPECIFIC INCIDENCE RATES OVER PERIOD 1986-1998



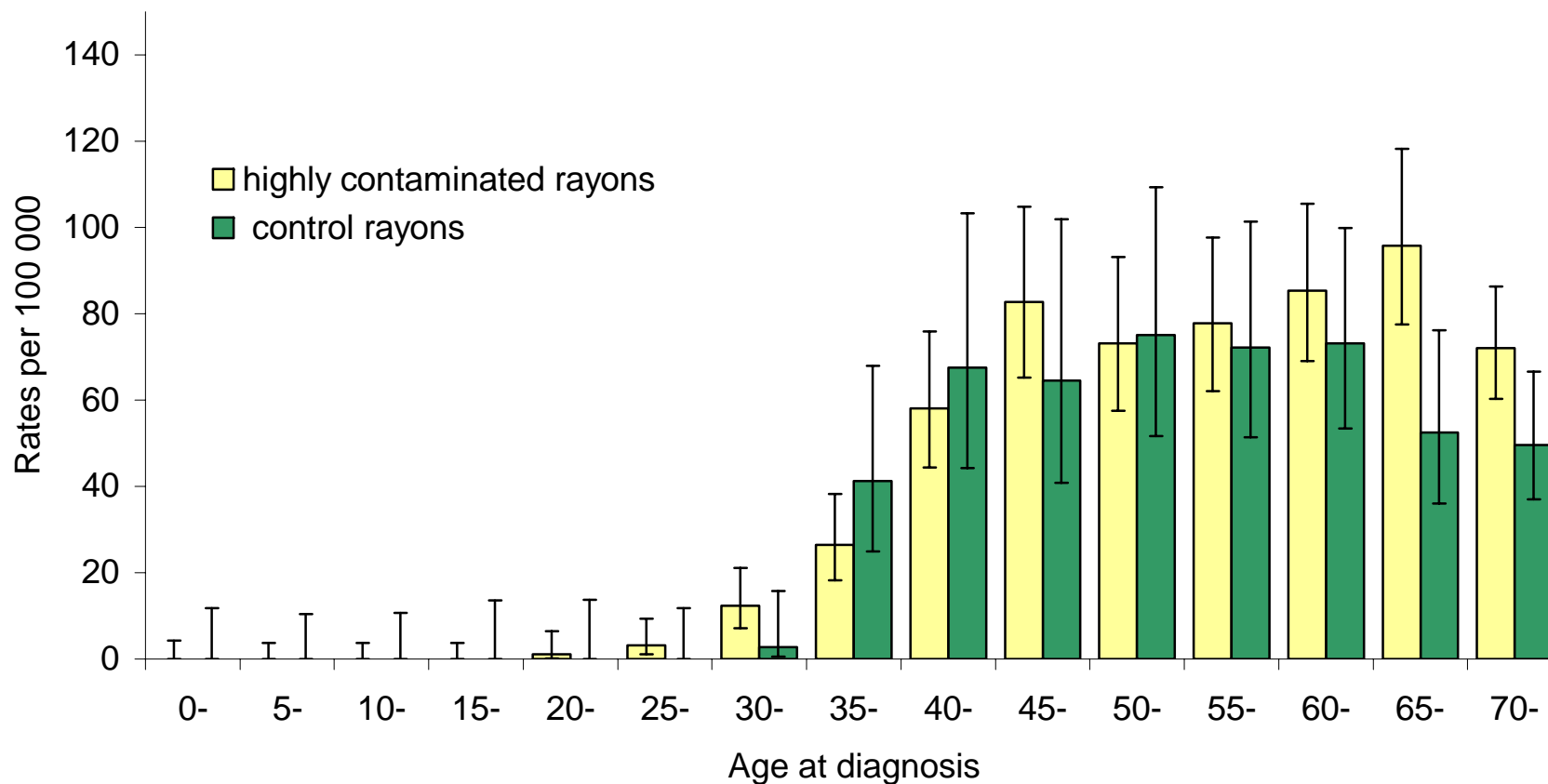
LUNG CANCER AGE-SPECIFIC INCIDENCE RATES OVER PERIOD 1986-1998



COLON CANCER AGE-SPECIFIC INCIDENCE RATES OVER PERIOD 1986-1998



FEMALE BREAST CANCER AGE-SPECIFIC INCIDENCE RATES OVER PERIOD 1986-1998



ESTIMATES OF RISK MODEL PARAMETERS USING *EPICURE*

	0-12 mSv	12-27 mSv	27-50 mSv
Mean dose, mSv	11.3	20.3	44.1
Person*Years	612 898	465 922	384 969
LUNG CANCER			
Cases	231	197	142
Relative risk 90%CI	1.0	1.12 0.96,1.32	0.98 0.82,1.16
STOMACH CANCER			
Cases	254	205	160
Relative risk 90%CI	1.0	1.06 0.91,1.24	1.00 0.85,1.18

ESTIMATES OF RISK MODEL PARAMETERS USING *EPICURE*

	0-12 mSv	12-27 mSv	27-50 mSv
Mean dose, mSv	11.3	20.3	44.1
COLON CANCER			
Person*Years	612 898	465 922	384 969
Cases	64	39	41
Relative risk 90%CI	1.0	0.80 0.68,1.12	0.78 0.53,1.10
BREAST CANCER			
Person*Years	319 300	243 706	202 541
Cases	156	81	56
Relative risk 90%CI	1.0	0.68 0.54,0.85	0.57 0.44,0.73

CONCLUSIONS

- Growth of thyroid cancer incidence in all age groups under study (15-29, 40-49, 50+ years old) regardless of sex has been found.
- Statistical analysis of relationship between thyroid cancer incidence and the level of soil contamination with ^{131}I as well as the content of stable iodine in soil showed that effects of iodine deficiency and radiocontamination were statistically significant in the period from 1992 to 1999.
- The radiation risk of thyroid cancer for the adolescents and adults of the Bryansk region in the observation period 1991–1998 has not been confirmed.

CONCLUSIONS

- No dramatic increase of solid cancer incidence over time occurred in the study regions either before 1986 or between 1986 and 1998.
- No statistically significant excess of different types of solid cancer incidence was found relative to controls during 1991-1998 in the population of the most contaminated areas of Russia.
- Stomach, colon, lung and breast cancer cases associated with possible radiation-induced cancer in the contaminated areas of the Bryansk oblast are comparable with the value of stochastic fluctuations.