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A DECADE

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Chernobyl: A Decade

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Chernobyl: A Decade

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Preface

The Chernobyl Sasakawa Health and Medical Cooperation Project completed its 5-year health screening project at the end of April 1996, and a total of about 160,000 children were examined in the project at the five diagnostic centers located around Chernobyl in Belarus, Russian Federation, and Ukraine.

The results of the health screening have been separately published every year since 1992 by the respective centers on the basis of their presentation at the Chernobyl Sasakawa Medical Cooperation Symposium. However, this volume presents the results of the 5-year health screening at all five centers from the viewpoints of dosimetry, thyroid diseases, and hematological abnormalities. This is because the Fifth Chernobyl Sasakawa Medical Cooperation Symposium held in Kiev, Ukraine, in October 1996 was the last one scheduled in the 5-year term of the project.

Although originally started in May 1991 as a humanitarian aid project in response to the request of the government of the former Soviet Union, the project became a collaborative work shared by Belarus, the Russian Federation, Ukraine, and Japan after the political upheaval in the summer of 1991. Furthermore, due to the enormous efforts of the specialists who participated in the project, the health screening was made uniform in all five centers on the basis of common protocol and standardized procedures, which resulted in data of relatively high comparability.

With the exception of some liquidators, the pattern of radiation exposure caused by the Chernobyl accident is quite different from that experienced by atomic bomb victims in Hiroshima and Nagasaki, Japan: the episodes in the majority of people around Chernobyl are caused by continuous exposure to low doses of radiation while the latter were characterized by a single instantaneous exposure to massive doses of radiation. I trust that an exchange of information acquired from each experience will make a great contribution to the world.

It is regrettable, however, that an epidemiological study of the health effects of the Chernobyl accident has remained in its infancy in the past 10 years because of the lack of a well-defined population and radiation dose estimates. While efforts should be made to estimate the radiation dose as accurately as possible, it is urgent to establish a population deemed to have been exposed to the accident on the basis of the most appropriate information available at present. Once such a population is established, I am confident from the experience of Hiroshima and Nagasaki that the data presented in this volume will serve to design epidemiological studies of high quality.

Itsuzo Shigematsu
Chairman
Chernobyl Sasakawa Project Advisory Committee
Consultant Emeritus
Radiation Effects Research Foundation

Addresses

Ministry of Health of Ukraine

Andrey M. Serdyuk, Minister

Millions of people suffered in the territories of the Ukraine, contaminated by radiation. More than 3.2 million people survived the accident, and our major problem and worry is the health of these people, particularly children. A total of 737 cases of thyroid cancer have been registered among children and teenagers who were less than 18 years of age at the time of the emergency. We are concerned about the general deterioration in the health of people still living in the contaminated areas, and our highest priority is the monitoring of health and assistance to those who were afflicted. In this connection we owe a debt of gratitude to the Japanese people, who have provided invaluable assistance over these past 10 years.

One of the most important humanitarian projects is the Chernobyl Sasakawa Project conducted since 1992 in the Ukraine, Russia and Belarus. We are thankful to the Sasakawa family, whose charitable activities for the victims of the Chernobyl catastrophe are known the world over. The wise words of the founder, Ryoichi Sasakawa, will live eternally in human memory: "The world is one family and all mankind are brothers and sisters." We are happy to know that Mr Yohei Sasakawa, son and successor of Mr Sasakawa, was among the visitors to the Ukraine, as well as Japanese scientists, members of the Sasakawa Memorial Foundation, colleagues from Belarus and Russia, and representatives of the five diagnostic centers created through the cooperation of the Chernobyl Sasakawa Project and the scientific and medical communities. I am very pleased to inform you that recently Mr Yohei Sasakawa was decorated with an Award of Achievement through an enactment of the President of Ukraine. Please let me wish the participants in the Fifth Chernobyl Sasakawa International Symposium creative and fruitful scientific discussions, and let me emphasize the necessity to continue the project as a long-term program for the people afflicted by the Chernobyl catastrophe.

Government of Ukraine

Vasiliy V. Durdinets, the first Vice Premier

Today, as never before, attention is riveted on the legacy of the Chernobyl accident. During the 10 years that have elapsed since that terrible catastrophe, humanity has fathomed the grave consequences of the disaster and learned many important lessons as a result. We have experienced, in a tangible way, how delicate and unprotected our globe is against nuclear threat. The Japanese people suffered a similar experience 50 years ago. Although we call this technology a miracle of human domination over nature, this miracle is evident mostly in the catastrophes born by that technology and by the history of the predatory approach to nature. From the former State, Ukraine inherited the ecological bomb in the Donbass area, the forests that are dead as a result of it, and the soil that is no longer fertile. We have been left on our own with this ecological catastrophe. However, the Chernobyl disaster has strengthened our will for life and for harmony with nature. Our State was the first to repudiate our own nuclear armaments.

The Chernobyl disaster had taught us that human beings are weak in the face of the threat of nuclear energy and that we have to take careful measures to cope with it. We must also take care of our children and grandchildren. However, the time that has elapsed has not been spent only on a fixation on the disaster. These have been years of practical action, years of systemic search for the implementation of a whole complex of large-scale measures to improve the ecological situation in the country. Despite economic difficulties, the state has been spending a lot of money to eliminate the consequences of the Chernobyl disaster, to protect the population socially and over time to alleviate the radiological consequences. The documents adopted by the President, by the Supreme Rada, and by the Cabinet of Ministers, reflect our Government's reactions to the disaster. Our intentions center on human interests and needs, on the improvement of living conditions and on the supply of ecologically safe food and health care. More than 250,000 people suffered directly from the catastrophe and another 200,000 fought the disaster. The number of these people has decreased in the wake of the disaster; thus the elucidation of the consequences is a priority. We are responsible for the safety of our citizens and for the prosperity of our country. Ukrainian scientists, who are active participants in world-famous centers, have done a lot of work in prognostication and in combating the consequences of the Chernobyl disaster, and issuing from this, a program has been developed by the Cabinet of Ministers to alleviate the ecological aftermath in the country. Psychological rehabilitation is also of importance, especially in the ecologically threatened regions.

These priorities are taken into account by the National Program to minimize the aftereffects of the Chernobyl disaster which will be submitted soon for consideration by Parliament. This document concentrates on the financial opportunities we have to provide for the protection of the suffering population. The program will use the allotted sums effectively to unite the efforts of ministries, agencies, and local authorities to solve the problems of the aftereffects of the Chernobyl disaster. We should stress that this program should be supported through proper financing and implementation and that it is quite clear that Ukraine cannot cope with the situation alone. Our state is working on dozens of programs with the participation of other countries and individual organizations, primarily WHO, IAEA, and investors from the USA, Federal Republic of Germany, Switzerland, Sweden, Canada and other countries. Our special gratitude goes to the people of Japan who with all their hearts have understood our problems and are providing genuine fraternal assistance to Ukraine in this difficult time.

Memorable for us was the day of January 25, 1992, when the Sasakawa Memorial Health Foundation started its humanitarian program to provide medical assistance for those who suffered from the Chernobyl disaster.

The charitable activities of the Sasakawa family are now known all over the world. Their kindness and cordiality crossed the borders sooner than any diplomatic efforts. In 1992, the Sasakawa Memorial Foundation helped to establish equipment in five centers, and since that time Japanese scientists have constantly provided scientific and technological assistance to care for the children and those who suffered from the disaster. More than 64,000 people in the Kiev and Zhitomir regions received diagnoses and treatment from the Japanese side. Your glorious name, Mr Sasakawa, has become a symbol of kindness and cordiality in Ukraine, and your beauty as a human being attracts all the world. Taking into account the contributions made by your foundation and its actions in providing assistance to the Chernobyl victims, the President of Ukraine Leonid Danilovich Kuchma issued a decree to award the president of the foundation, Yohei Sasakawa, with the Order for Merit of the Third Degree. I would like to congratulate you on this award and wish you energy, health and success in your work for many years to come. The government decided to give the honorary diplomas of the organizing committee to professors Shigematsu Itsuzo, Kuramoto Tsuyoshi, Kiikuni Kenzo, Yamashita Shunichi and Nagataki Shigenobu, and the manager of the project Maki Hiroko. Let me extend on behalf of the Government of Ukraine our sincere congratulations on the occasion of these high awards from the organizing committee. We wish them great success in the future, and we look forward to the continued development of this wonderful project that means so much to the people of Ukraine. The tragedy that united us could be overcome only together. Thank you for your attention.

The Nippon Foundation

Yohei Sasakawa, President

It is my great honor to make this address and to welcome you on the occasion of the opening of the Chernobyl Sasakawa Medical Symposium. It is also a great honor to be decorated with the Order of Friendship of Ukraine. I would like to take this opportunity to express my gratitude to the president of Ukraine and the people of Ukraine. I interpret it as a sign of recognition and appreciation for the work done by those who participated in the Chernobyl-Sasakawa project, and I believe I am allowed to share this honor with them.

The Chernobyl Sasakawa Health and Medical Project was launched in 1991. In early 1990, when I visited Moscow as head of an economic mission, the administration of the USSR asked the Nippon Foundation to render assistance to the people affected by the Chernobyl catastrophe. It had been the motto of my father, who was then the chairman of the Foundation, that the world is one family and that all humankind are brothers and sisters. From this humanitarian point of view, we began to think how we as Japanese could assist those who were affected by the Chernobyl accident.

As you all very well know, Japan is the only country in the world to have suffered atomic bombings. One of the unanticipated outcomes of this tragedy, however, was that Japan became a world leader in the field of radiation medicine. Therefore, as soon as I returned to Japan, I consulted Dr Shigematsu, Prof Okajima, Prof Kuramoto, Prof Nagataki, and other outstanding scientists working in Hiroshima and Nagasaki, and an advisory committee was soon formed in Japan. The committee members visited the Chernobyl area to study the situation in this area in the summer of 1990.

Back in Japan, the committee held many discussions and consultations on how to help the people living in the Chernobyl area cope with the grave problems they faced. What can one private foundation do to assist the afflicted? Where should we focus our financial assistance? The answer from our committee, headed by Dr Shigematsu, was that: in view of the tragic experience of Hiroshima and Nagasaki, the children from birth to 10 years of age at the time of the accident should be given medical examinations, and that state-of-the-art equipment should be provided because no mistake could be excused in the examination of these children. The Nippon Foundation decided to fund the Chernobyl Sasakawa Health and Medical Cooperation Project, as proposed by the Japanese experts. The actual implementation was entrusted to the Sasakawa Memorial Health Foundation, which has many years of experience in international health and medical cooperation.

Thus, as a result of preparatory work in Japan, we managed to bring together the best of our experts and to reach a consensus on the selection of Japanese equipment and appliances. In 1991, at the time of Soviet President Gorbachev's visit to Japan, we loaded the equipment onto the cargo aircraft Antonov for shipment back to the USSR. On more than 60 occasions after that, Aeroflot Russian International Airlines provided transportation at a special rate when we sent equipment, consumable goods or reagents to the centers. To Aeroflot we are very grateful.

I would like to emphasize the fact that the project was successfully implemented not only due to the funds which were allotted, and not only due to the equipment which was provided, but I also wish to express my deep appreciation to the representatives of the three countries and five centers who, with their high level of commitment and professionalism, mastered the use of all the facilities in their work. Needless to say, we faced numerous problems over the past 5 years. Despite the fact that there were also some misunderstandings based on social and cultural differences, the physicians and paramedics of Ukraine, Belarus, Russia and Japan united in efforts to examine the largest possible number of children using the opportunities provided. Without these people, and without their commitment and enthusiasm, we would never have been able to implement the project.

Over the 5-year period, Japanese medical specialists saw more than 300 persons/visit in three countries, and all of them visited the respective centers more than 10 times. At the same time, more than 300 people from the three countries visited Japan, not only for training but also to join with Japanese scientists to find solutions for common problems. Due to this tremendous scientific effort, we managed to examine nearly 160,000 children within 5 years. I will not touch upon the results of the examinations, for they will be cited during this symposium.

Last year there was a great misfortune in Japan – the earthquake which destroyed the city of Kobe. I refer to this earthquake because it was a disaster similar in many ways to the Chernobyl accident. A large portion of the population suffered from the earthquake and in addition to medical problems we had to address issues of a purely psychological nature. Among the 160,000 children examined, some were unfortunately gravely ill. We extend our sincere sympathy to those children, but at the same time we are encouraged by the fact that the majority of children were healthy. This happiness is not only for the children themselves but also for their parents. This is what we call the hidden success of our activities. I most certainly do hope that all the efforts which were started 5 years ago will continue.

Our 5-year project has reached completion. A total of US$45 million was used to implement it. The scientific efforts as well as the physical strength of the participants was poured into the project. I am confident that the cooperation will continue. Let me emphasize that a huge amount of data has been collected. The data must be used to render further assistance to those afflicted. My father used to say that you must lend an ear to what your priest and physician say. I think that the results of the symposium will bring us to a conclusion to which we also have to lend an ear.

Representatives of our four countries are present here, united by a tragedy. However, our common efforts blossomed into deep friendship, and I hope that this friendship among the specialists of the four countries will foster cooperation in many other fields as well. In conclusion, let me express again my gratitude to the Ministry of Health of Ukraine, which cosponsored this symposium, to the representatives of the four countries, and to all the participants in the Chernobyl-Sasakawa project. I would also like to take this opportunity to thank all the interpreters and translators who helped to implement the project. Thank you.

Academy of Medical Sciences of Ukraine

Vladimir V. Frolkis, Vice President

This is a symposium of not only scientific interest but also great humanitarian meaning. The happiness of a single person cannot be unnoticed by other people, and vice versa. That is why the famous American writer Hemingway said, "ask not for whom the bell tolls, it tolls for you." Science is the creation of humanity, and the tuberculosis bacterium discovered by Robert Koch was an achievement not only for the German people but for all humankind, and as a result of that discovery he was elected as an honorable member of many academics. And when Ilya Mechnicov discovered cellular immunity, it became a legacy for the community of all scientists.

It is therefore my great honor today to present a Diploma of the Academy of Sciences to the prominent scientist Shigenobu Nagataki. Prof Nagataki is a leading specialist in the field of radiological medicine and endocrinology. His work on thyroid cancer is universally recognized. Prof Nagataki is a member of several international scientific societies, two institutes (the Institutes of Radiation Medicine and Endocrinology) have nominated him to be a member, and we have unanimously voted for his nomination as a honorary member of our National Academy. Ukraine is famous for its high degree of development in biological and medical sciences. That is why the election of the distinguished professor to become a foreign member of the Academy is a great honor for us. Along with the award, I would like to extend the best compliments from all our academicians and our president Dr Vozianov.

The Parliament Committee for the Affairs of the Chernobyl Disaster, Ukraine

Vladimir M. Yatsenko, Head

The single sacred goal to protect the people who were affected by the Chernobyl accident has gathered us here in this hall. The Chernobyl Sasakawa project is a unique example of concrete assistance, not by word but by deeds, to the people who were affected by the Chernobyl accident. One of the diagnostic centers operates in Korosten in my constituency and so I know the enormous assistance that it has given to the people. We are interested in the continuation of the work because the consequences of the Chernobyl accident will affect many generations to come, and we created a legislative basis and provided funds from the budget for the protection of our people from the consequences. The Chernobyl problem requires the concentration of global efforts.

I would like to express my deep gratitude to Mr Sasakawa and my hopes for continued friendly cooperation between our two countries.

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Health conditions of children in the Kiev region 10 years after the Chernobyl nuclear power plant accident: based on the results of health examinations made by the Chernobyl Sasakawa Diagnostic Center (Kiev Regional Hospital No. 2)

Alexandr I. Avramenko
Health Care Department of Kiev Region, Kiev, Ukraine

The Chernobyl catastrophe affected more than 1 million people, or about 50% of the total population of the Kiev region. The harm caused by the tragedy was great, and now scientists and specialists are faced with the enormous task of trying to alleviate it. We are paying a very high price indeed for our thoughtlessness with the health and lives of our people.

Our greatest concern is for the health of our children because they will have to spend the rest of their lives under the risk of late effects of radiation. About 200,000 out of 295,000 children in the Kiev region were exposed to radiation, and follow-up studies show that the health status of the exposed is deteriorating with time. Although 53% of the children were healthy in 1986, only 31, 21, and 20.5% were healthy in 1993, 1994, and 1995, respectively.

Most frequently observed are diseases of the endocrine system, metabolism disorders, and immunity abnormalities, followed by diseases of the respiratory and nervous systems, and by diseases of the digestive system and skin disorders. The number of cancers has also increased dramatically. Although there were only four cancer cases in 1987, we observed 78 cases in 1995. Cancer of the lymphatic nodes and blood-forming system, as well as abnormalities of the respiratory and digestive systems, increased by 22% primarily as a result of depression of the immune system and development of secondary radiation-induced immunodeficiency.

The status of the thyroid, which is one of the most important glands in the endocrine system, is very important in childhood because it is intimately involved in the physical and psychological development of children. The condition of the thyroid in fact reflects both the present health status of a child and the prognosis for the future. It is said that 400 radionuclides were emitted as a result of the Chernobyl accident. Of these, 205 were iodine radionuclides and played the most important role in thyroid exposure. Thyroid dose estimates show that 60,000 children received 0.3 Gy, and more than 6,000 children received 0.3–3.0 Gy. It is clear from the results that thyroid abnormalities are not decreasing but rather increasing even 10 years after the accident. The number of goiters has increased by 44 times, hypothyroidism by 5.7 times, and nodal formation by 55 times. The number of thyroid cancers has also increased sharply: only five or six cases of thyroid cancer per year were reported in the affected areas before the accident, but 270 cancers were registered in 1995. Previously, we did not have any cases of thyroid cancer in the Kiev region, but over the past 9 years and 9 months we have diagnosed 10 thyroid cancers among children exposed to both large doses such as 50 cGy and small doses ranging between 2 and 5 cGy.

The new diagnostic center, which was founded in the Kiev region through the assistance of the Sasakawa Foundation, has enabled us to screen more than 30,000 children (52.4% girls and 47.6% boys) ranging in age from 10 to 14 years old (Table 1). The scientific method for the examination of children developed jointly with Japanese scientists proved to be excellent and was very favorably assessed by WHO. As a result, 61% of the children examined had goiters and 834 had abnormalities of the thyroid, including 11 children with abnormal ultra-

Table 1. Sex and place of a residence-specific number of children examined at the Kiev Center from May 1991 to April 1996[a].

Place of residence	Boys	Girls	Total
Baryshevskii R.	176	133	309
Belotserkovskii R.	215	225	440
Boguslavskii R.	227	212	439
Borispolskii R.	181	173	354
Borodyanskii R.	955	1013	1968
Brovarskii R.	814	852	1666
Vasilkovskii R.	265	300	565
Volodarskii R.	625	747	1372
Vishgorodskii R.	1353	1381	2734
Zgurovskii R.	1	2	3
Ivankovskii R.	632	635	1267
Kagarlytskii R.	352	449	801
Svyatoshinskii R.	1667	1765	3432
Makarovskii R.	411	521	932
Mironovskii R.	9	13	22
Obukhovskii R.	345	331	676
P. Khmelnitskii R.	9	6	15
Polesskii R.	406	413	819
Rakitnyanskii R.	518	615	1133
Skvirskii R.	3	7	10
Stavischenskii R.	342	408	750
Taraschanskii R.	3	7	10
Tetievskii R.	262	342	604
Fastovskii R.	230	406	636
Yagotinskii R.	3	10	13
Kiev City	390	486	876
Irpenskii R.	2876	2990	5866
Total	13270	14442	27712

[a]The children examined two or more times were counted once.

sonography findings and six with thyroid cancer (Table 2). Goiter mainly appeared in children from the Brovarskoi, Makarovsky, Rokityansky and Fastovsky regions (Fig. 1). The prevalence of goiter was generally higher in girls than in boys, and the titers to thyroglobulin and microsomal antibodies also showed a higher positivity in girls. In 1994, the titers to thyroglobulin and microsomal antibodies were positive in 2.8% of cases, but last year the figure had risen to 3.8%. Goiter was observed in 62% of children living in areas with a density of 1.5 Ci/km^2 and in 70% living in areas with a density of 5, 10 or >30 Ci/km^2 (Fig. 2).

Table 2. Subjects with thyroid abnormalities by sex and place of residence among children examined at the Kiev Center from May 1991 to April 1996.

Place of residence	Number of subjects examined		Diagnosis									
			Nodular lesion		Cystic lesion		Abnormal echogenity		Anomaly		Cancer	
	B	G	B	G	B	G	B	G	B	G	B	G
Baryshevskii R.	176	131	1	2	0	1	3	5	0	0	0	0
Belotserkovskii R.	215	225	1	1	0	1	3	15	0	0	0	0
Boguslavskii R.	227	212	0	0	2	3	5	6	0	0	0	0
Borispolskii R.	178	167	0	0	0	1	3	9	0	0	0	0
Borodyanskii R.	952	1010	1	3	0	1	9	22	0	1	0	0
Brovarskii R.	810	849	1	3	0	2	15	42	0	0	1	0
Vasilkovskii R.	265	300	0	2	0	0	9	8	0	0	0	0
Volodarskii R.	625	747	0	1	0	5	4	27	0	0	0	0
Vishgorodskii R.	1350	1377	2	1	1	2	39	65	2	0	0	0
Zgurovskii R.	1	2	0	0	0	0	0	1	0	0	0	0
Ivankovskii R.	629	633	0	1	1	0	0	5	0	0	0	0
Kagarlytskii R.	351	448	1	1	1	0	3	9	0	0	0	0
Svyatoshinskii R.	1664	1761	1	3	4	11	31	83	1	1	0	1
Makarovskii R.	409	520	1	1	0	1	9	22	1	0	0	1
Mironovskii R.	9	13	0	0	0	1	0	0	0	0	0	0
Obukhovskii R.	344	331	0	3	3	1	7	21	0	0	0	0
P. Khmelnitskii R.	8	6	0	0	0	0	1	1	0	0	0	0
Polesskii R.	370	378	0	0	0	0	0	0	0	0	0	0
Rakitnyanskii R.	517	611	1	0	1	1	5	19	0	0	0	0
Skvirskii R.	3	7	0	0	0	0	0	0	0	0	0	0
Stavischenskii R.	341	405	0	1	0	1	2	9	0	0	0	0
Taraschanskii R.	3	6	0	0	0	0	0	3	0	0	0	0
Tetievskii R.	261	341	0	0	0	0	4	10	0	0	0	0
Fastovskii R.	218	390	1	1	0	0	5	20	0	0	1	0
Yagotinskii R.	3	10	0	1	0	0	1	1	0	0	0	0
Kiev City	383	480	2	3	0	2	14	32	0	2	0	1
Irpenskii R.	2867	2985	0	5	5	6	74	153	0	3	0	1
Total	13179	14345	13	33	18	40	246	588	4	7	2	4

Note: B = boys, G = girls.

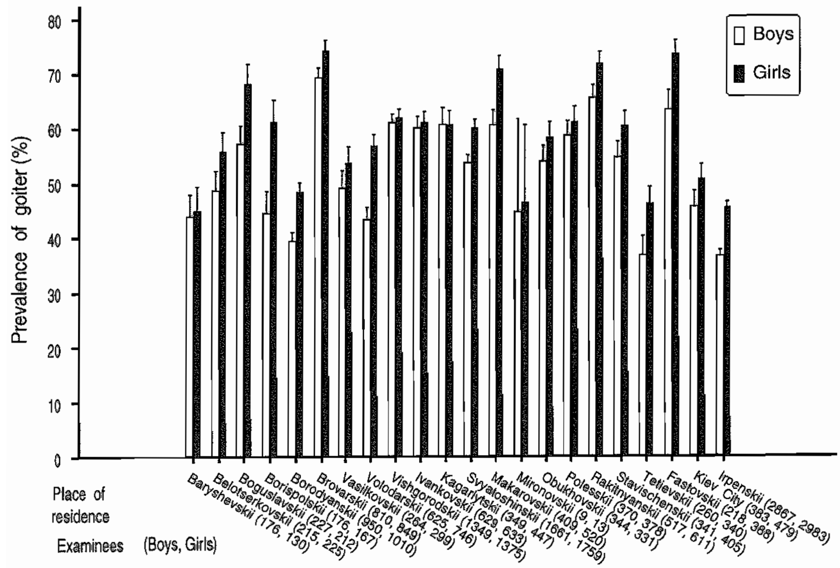

Fig. 1. Prevalence of goiter by sex and place of current residence among children examined at Kiev Center from May 1991 to April 1996. The whiskers denote the standard errors.

The highest cesium accumulation was observed among children living in Polessky, Vyshkorovsky, Ivankovsky and other areas adjacent to the Chernobyl plant

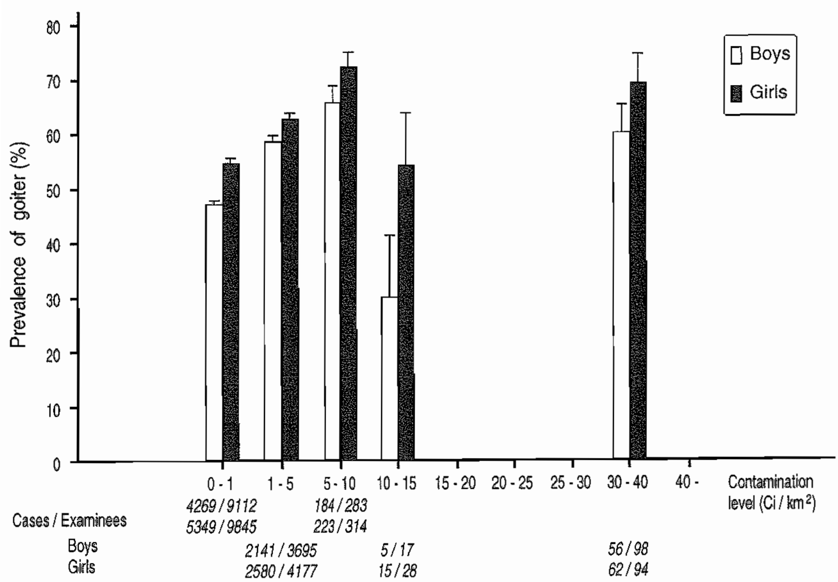

Fig. 2. Prevalence of goiter by contamination level in the place of current residence among children examined at the Kiev Center from May 1991 to April 1996. The whiskers denote the standard errors.

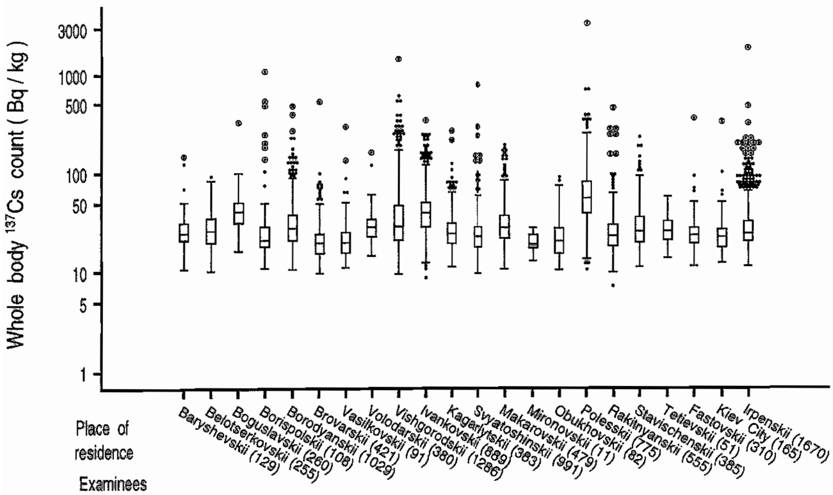

Fig. 3. The box-and-whisker plots of whole-body ^{137}Cs count per kilogram body weight by place of residence among children examined at the Kiev Center from May 1991 to April 1996. The children with a whole-body ^{137}Cs count less than the detection limit (540 Bq) were excluded. The bottom and top ends of the box and the bar inside the box correspond to the 25th, 75th and 50th sample percentiles, respectively. The black dot and the double circle with black dot represent extreme values, called "outside" and "far out", respectively.

(Fig. 3). General analyses showed no correlation between the prevalence of goiter in relation to cesium activity, although in cases where the ^{137}Cs count was more than 100 Bq/kg the prevalence of goiter was more than 90% in girls and 100% in boys (Fig. 4). These data are, however, not statistically reliable, because only a small number of children were investigated.

In connection with this, it was very painful for us to hear that we shall not be able to continue working in the future as we did before. It will be very difficult for us to work alone because our state cannot afford to finance the work alone, and so we are now asking scientists in Japan if it is possible for us to continue this work together.

The data show a greater whole-body count of ^{137}Cs among children over 11 years of age than among younger children (Fig. 5). The highest whole-body ^{137}Cs count was registered among children at the age of 15 years, and abnormal echogenity was one of the most common abnormalities of the thyroid gland.

During our work in the Chernobyl-Sasakawa project, 58 cysts, 46 nodules, 11 abnormal echogenity findings, and six thyroid cancers were diagnosed (Table 2). Most of the children had positive antibodies to thyroglobulin. The investigation of iodine content in urine shows that it had decreased from 8 to 5. Hematological studies over the 5-year period also showed deviations from normal in WBC and RBC counts. A total of 150 children had anemia, three had leukemia, two had other abnormalities, and four had Werlhof disease. The highest prevalence of hematological problems was in children living in regions with a cesium contami-

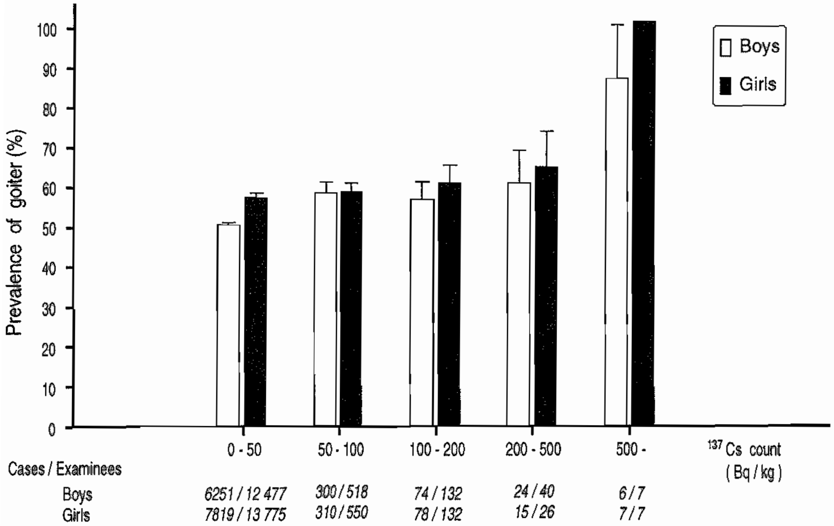

Fig. 4. Prevalence of goiter by whole-body ^{137}Cs count in children examined at the Kiev Center from May 1991 to April 1996. The whiskers denote the standard errors.

nation of 1—5 Ci/km^2, such as Borodyansky, Volodarsky, Ivankovsky and Makarovsky (Table 3). In these regions the level of ^{137}Cs contamination was only

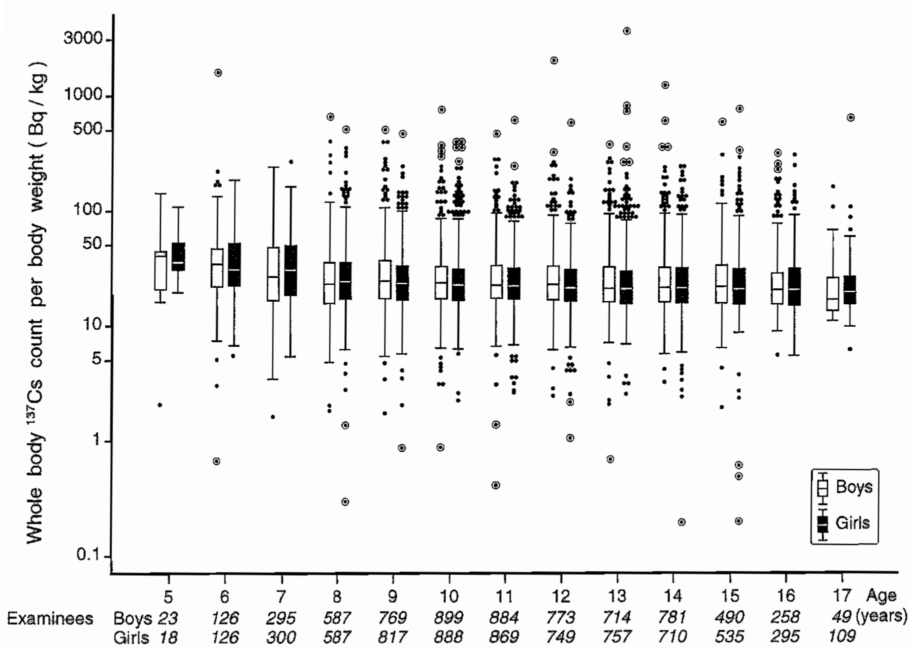

Fig. 5. The box-and-whisker plots of whole-body ^{137}Cs counts per kilogram body weight by sex and age among children examined at the Kiev Center from May 1991 to April 1996.

Table 3. Hematological abnormalities by contamination level in the place of residence at the time of the accident and sex among children examined at the Kiev Center from May 1991 to April 1996.

Diagnosis	Contamination level in the place of residence at the time of the accident (Ci/km^2)									
	0–1 (11502, 12511)[a]		1–5 (1230, 1320)		5–10 (299, 340)		10–15 (4, 7)		15– (149, 160)	
	B (%)	G (%)	B (%)	G (%)	B (%)	G (%)	B (%)	G (%)	B (%)	G (%)
Anemia	42	93	6	3		2			2	
Hb < 110 g/l	(0.4)	(0.7)	(0.5)	(0.2)		(0.6)			(1.3)	
Leukopenia	69	31	6	1		1				
B: WBC $< 3.8 \times 10^9$/l	(0.6)	(0.2)	(0.5)	(0.1)		(0.3)				
G: WBC $< 3.6 \times 10^9$/l										
Leukocytosis	531	622	71	73	23	16		2	11	7
B: WBC $> 10.6 \times 10^9$/l	(4.6)	(5.0)	(5.8)	(5.5)	(7.7)	(4.7)		(28.6)	(7.4)	(4.4)
G: WBC $> 11.0 \times 10^9$/l										
Thrombocytopenia	7	9	1	1	1	2				
PLT $< 100 \times 10^9$/l	(0.1)	(0.1)	(0.1)	(0.1)	(0.3)	(0.6)				
Thrombocytosis	159	167	21	16	6	4			4	2
PLT $> 440 \times 10^9$/l	(1.4)	(1.3)	(1.7)	(1.2)	(2.0)	(1.2)			(2.7)	(1.3)
Eosinophilia	1434	1592	207	219	62	50	1	1	20	21
Eo $> 0.5 \times 10^9$/l	(12.5)	(12.7)	(16.8)	(16.6)	(20.7)	(14.7)	(25.0)	(14.3)	(13.4)	(13.1)

[a]The number of boys and girls examined. Note: B = boys, G = girls, % = percentage of children with the respective abnormalities.

1.7–2.13 Ci/km^2. Analysis of hematological abnormalities did not provide any statistically reliable data.

Conclusions

The prevalence of thyroid abnormalities has increased during the 10-year period since the Chernobyl accident. There is more thyroid pathology in girls than in boys. There is no statistically reliable correlation between thyroid abnormalities and cesium concentration. Thyroid cancer developed not only in children exposed to high doses of 200 to 500 cGy but also in those exposed to much lower doses. The sensitivity of the thyroid to irradiation was caused not only by irradiation but also by other factors not related to radiation. There was also an increase in hematological abnormalities among children. All these findings require further investigation, and we hope for a continuation of cooperative efforts. We believe that it is also necessary to conduct further clinical and epidemiological studies on thyroid abnormalities in the children in contaminated regions, to study both external and internal exposure in patients with thyroid abnormalities, to examine the thyroid status of children resettled from the town of Pripyat, which suffered very high external exposure, to re-examine children who had any abnormalities during the first investigation, to study the status of children born between 1986 and 1990 who continued to reside in the contaminated Ryasankovsky region, and to study the cohorts of children who live in the areas with increased density of reactive contamination and iodine deficiency.

The results of the project have enabled us to create a data bank on the thyroid status of children in the Kiev region and to study the effects of radiation together with iodine deficiency and other nonradiation factors such as ecological conditions, nutrition, stress and social, economic and emotional factors. It is now necessary to develop a program for the rehabilitation of children, to implement it, and to evaluate the results of preventive and curative measures including thyroid cancer treatment.

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Summary of the 10-year observation of thyroid disorders among Ukrainian children who were exposed to ionizing radiation after the Chernobyl disaster: tasks for the future

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In view of the analysis of data from the 10-year observation of persons in the Ukraine subjected to ionizing radiation as a result of the Chernobyl accident, nobody is surprised today that the key problem now is the medical problem of thyroid pathology. I would like to tackle briefly the basic results that we obtained within these recent years.

As to the function of the thyroid gland, thyroxin levels increased after thyroid irradiation of 500 Bq, but no clinical manifestation was observed. To explain this fact, we conducted a number of studies to determine the level of free thyroxin in children. The level of free thyroxin was within the norm, or slightly increased. TSH was decreased in children of the same group. It should be stressed that the increase in thyroxin level depended on the child's age. Blood thyroxin level was significantly higher in children of 3 years old than in the older age groups. A further stage of this study showed a normalization in the thyroxin level. One of the important indices of appearance of possible signs of hypothyroidism is an increased level of blood TSH. In our investigations, during the whole period after the accident, the mean level of blood TSH was within the limits of fluctuations noted in children of the control group.

In view of the possibility of autoimmune thyroiditis, we determined the antibodies to Tg. Over the whole period, the average values fluctuated within the norm; the same applies to the antibodies as to microsomal fraction. However, further similar investigations are needed in connection with the possibility of the appearance of hypothyroidism and autoimmune thyroiditis.

As far as analyzing the thyroid pathology situation is concerned, we found that the number of thyroid cancers among children and teenagers is growing in the Ukraine. Based on that fact, a thyroid cancer registry was formed at the Institute of Endocrinology and Metabolism of Ukraine. The registry consists of three units: passport data, clinical and morphological findings, and dosimetry data. During the period of 1986–1995 there were 732 cases of thyroid cancer registered among children and teenagers (Fig. 1). Thyroid cancer frequency increased among children. There were 482 cases of childhood thyroid cancer during the period of 1986–1995 (Fig. 2). The morbidity index for thyroid cancer for

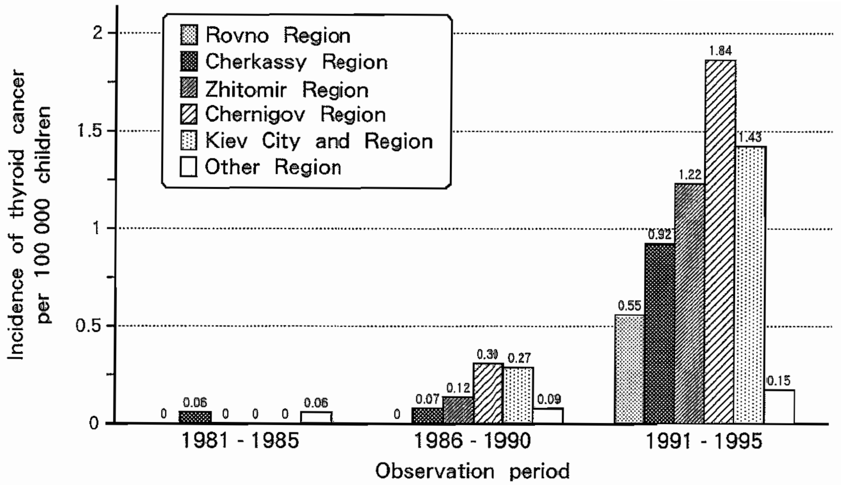

Fig. 1. Mean annual incidence of childhood thyroid cancer in the Ukraine by region and observation period (per 100,000 children).

100,100 children contingency was no higher than 0.06 in 1981–1985, but starting from 1990 this index suddenly increased (Fig. 3). The highest morbidity of thyroid cancer was registered in the Chernigov region (1.84 between 1991 and 1995) (Fig. 3). This is one of the most severely contaminated regions. The morbidity of thyroid cancer among children evacuated from the Prypyat and Chernobyl areas constitutes 28.9 cases per 100,000 children population.

The Ukrainian Center of Radiation Medicine made dosimetric passportization according to doses of irradiation, zones of residence, and thyroid doses. The number of excessive thyroid cancer cases per 1 million children was higher in the population with a thyroid dose more than 60 cGy.

At the morphological analysis, in 94% of such cases, papillary carcinomas were represented. But a typical variant of papillary carcinoma was observed in 10% of cases. More than 80% of papillary carcinomas were presented by a solid follicular variant. These tumors are very aggressive, causing metastases to the lymph nodes and lungs.

The papillary carcinoma in the Ukraine is more common in comparison to the UK, based on joint research with Cambridge University (Prof D. Williams). The solid follicular variant of papillary carcinoma is found in 77% of children in the Ukraine and in only 35% in the UK.

A Ukrainian-American project has been implemented to calculate effective doses and to determine thyroid cancer, hypothyroidites, and benign tumors depending on the dose. This work has already begun.

Next year we will start the analysis of the role of lymphoid infiltration in the development of thyroid tumors (together with Prof D. Williams, Cambridge University). The purpose of the project is to carry out a comparative morphological analysis of thyroid tumors among children in the Ukraine, as well as molecular

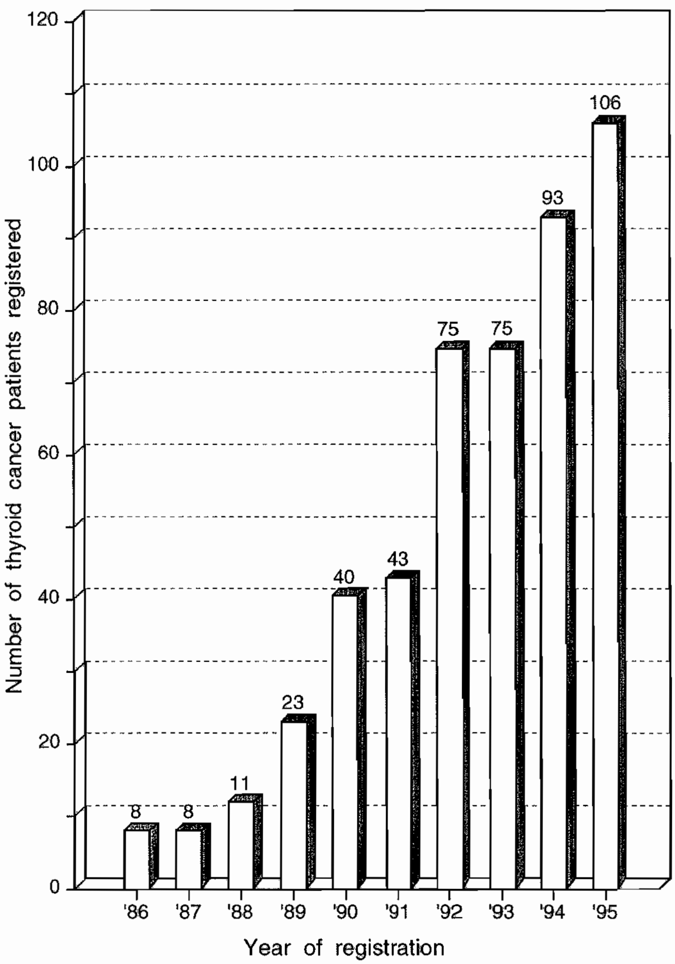

Fig. 2. Annual number of registered thyroid cancer patients in the Ukraine aged 0—14 years at the time of the accident.

biology studies on the participation of different oncogenes in thyroid carcinogenesis.

A project for studying the clinical features of children with thyroid cancer (together with Prof A. Pinchera, University of Tirrenia-Pisa) is also planned to start from 1997.

We are planning to study the routes of signal transfer of different factors participating in thyroid oncogenesis. This project will be implemented together with Prof Nagataki and Prof Yamashita.

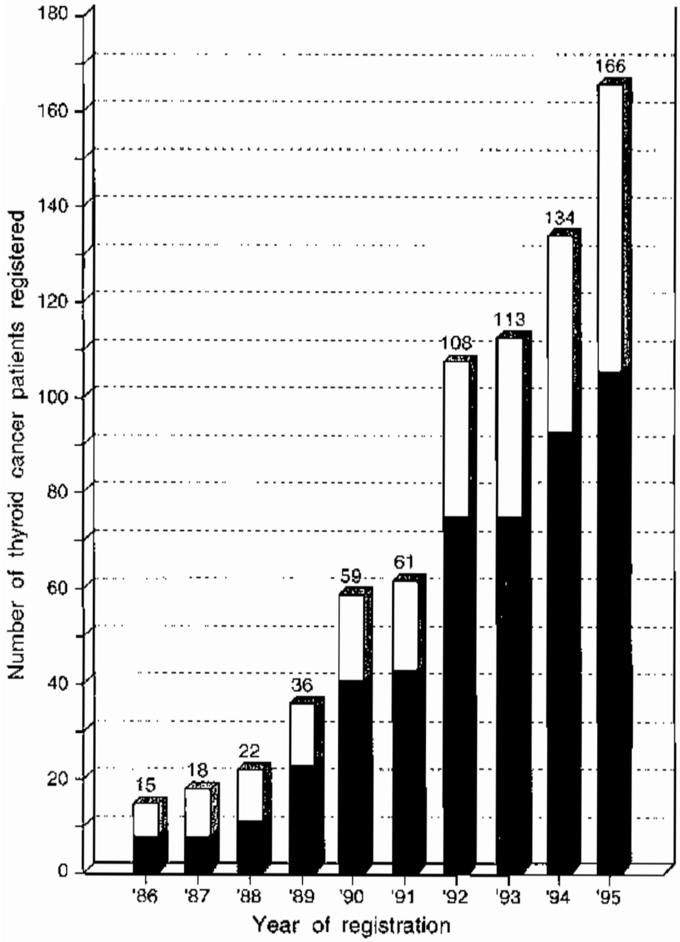

Fig. 3. Annual number of registered thyroid cancer patients in the Ukraine aged 0—18 years at the time of the accident. The lower black columns present the number of cancer patients aged 0—14 years at the time of the accident (cf. Fig. 2).

Reports on the Chernobyl Sasakawa Health and Medical Cooperation Project

Chernobyl: A Decade
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Chernobyl Sasakawa Health and Medical Cooperation Project: structure and scope

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Background

The Chernobyl Sasakawa Health and Medical Cooperation Project started in May 1991 as a 5-year program, and by the end of the program in April 1996 we had accomplished medical screening of almost 160,000 children living in Belarus, Russia and the Ukraine. This publication presents the proceedings of the Fifth Chernobyl Sasakawa Medical Symposium held in Kiev and a summary of the project. To the best of my knowledge, this Chernobyl Sasakawa project is the largest screening program of the children living in the contaminated areas to date. The project was introduced in the No. 16 issue of the *DHA News*, the official bulletin of the UN Department of Humanitarian Affairs, and it has also been quoted in scientific papers such as Williams et al.'s report in "One Decade after Chernobyl: Proceedings of an International Conference", April 1996, sponsored by the EC, IAEA and WHO.

The project was originally conceived in response to a request from the USSR government in 1990. The first concern of the late Ryoichi Sasakawa, founder of both the Nippon Foundation and the Sasakawa Memorial Health Foundation, was what Japan could offer most and best, with the experience of Hiroshima and Nagasaki, to the people of USSR who were still suffering from the aftermath of the accident. The request was first addressed to the Nippon Foundation, which is well known as a leading private financial contributor to WHO, but the planning and implementation of the project was entrusted to the Sasakawa Memorial Health Foundation which has long and varied experience in international health and medical cooperation in such fields as leprosy control, parasite control and AIDS control.

In order to understand the situation and the magnitude of the problems caused by the Chernobyl accident, such as the radiocontamination levels and past or planned relief activities, the Sasakawa Memorial Health Foundation organized several missions (the first in August 1990) which were headed by Dr Shigematsu and comprised Japanese medical experts engaged in various medical research activities related to the Hiroshima and Nagasaki atomic bombings. They reported: 1) that great psychological uncertainty and fear were prevalent among the people, due in part to the lack of dissemination of accurate information; and

2) that determining the actual state of the effects of the accident was essential.

With this recommendation, Ryoichi Sasakawa concluded from a humanitarian point of view that it was crucial to eliminate the unnecessary fear of parents, particularly mothers. Our goal was clear: to carry out medical screening of children so as to provide accurate information to mothers on the health state of their children, who are highly susceptible to the effects of radiation. Another important reason for focusing on children was that it was in them that we saw hope for the future. The fundamental concept of cooperation in this project was to determine what could be done today to build a better future, which is also one of the underlying objectives of both the Nippon Foundation and the Sasakawa Memorial Health Foundation.

Although originally launched by the USSR and Japan as a joint endeavor to help the victims of the Chernobyl disaster, the project became a collaborative work shared by the Republic of Belarus, the Russian Federation, the Ukraine and Japan after the political upheaval in the summer of 1991. It should be noted that this incident fortunately did not alter the project because our initial plan had been formulated on the basis of a decentralized policy; the agreement was exchanged between the Foundation and local centers, not with the USSR government.

Project

The aims and structure of the project can be summarized as follows:

1. The project aims to be humanitarian in nature but also to be scientific. It is our fundamental belief that a truly humanitarian act of this kind needs to have a solid scientific basis.
2. The main activity of the project is medical screening of children living in the affected areas, and we have a responsibility to provide reliable and accurate information on the results of screening to those examined. If any abnormal findings are detected in a child, he/she will receive follow-up examinations until a final diagnosis is made. It is imperative, therefore, that the first screening be carried out with the utmost accuracy and precision.
3. The data obtained from the screening must be of high quality and reliability to avoid misinterpretation. For this purpose, the standardization of screening procedures and various examinations is of crucial importance. State-of-the-art medical equipment was employed in the screening. In order to obtain standardized data from the five centers, continuous efforts have been made, by training and quality control, to maintain optimal conditions regarding the screening staff, medical equipment, reagents and supplies.
4. Data obtained from the screening activities are a valuable asset for the future of humankind. Thus, the management of data becomes an important aspect of the project. One of our next targets of data analysis will be to determine the effects of radiation at the time of the accident, both internal and external, on the health of children.

The territories radiocontaminated by the Chernobyl accident are vast, and more than 4 million people were living there at the time of the accident. In accordance with the decision of the countries concerned, therefore, we established five collaborating centers around Chernobyl as bases for the screening activity: the Mogilev and Gomel Centers in Belarus, the Klincy Center in Russia, and the Kiev and Korosten Centers in the Ukraine.

The activities of the project include: 1) the donation of five buses equipped with a highly advanced thyroid ultrasound instrument, hemoanalyzer, whole-body counter, etc.; 2) the establishment of five centers with the same equipment as that in the mobile units; 3) the donation of medical equipment and consumable goods; 4) the continuous supply of medical reagents; 5) sending Japanese experts to the centers; 6) training of medical staff of the centers on site and in Japan; and 7) health education of the residents of the affected areas.

The subjects of the health examinations are children born between 26 April 1976 and 26 April 1986 (aged 0–10 years at the time of the accident), and 158,995 were examined during the 5-year period. The health examination, both in the mobile diagnostic laboratory (bus) and at the center, includes the following: 1) collection of disease history and biographical information; 2) collection of anthropometric data; 3) measurement of whole-body ^{137}Cs radiation dose; 4) ultrasonography with quantitative measurement of the thyroid; and 5) blood sampling for further analysis. All the information obtained is processed at each center and then entered into a database at the Mogilev Center.

We have organized a workshop and a symposium every year since 1991 with the five centers and the Ministry of Health of the three republics to review the past achievements and to confirm our next step and direction. With such efforts, the quality of examination data and information on individuals has indeed improved yearly, and the data thus accumulated provide an invaluable database for future analyses. Other accumulated materials such as blood smears, serum samples, thyroid images stored on magnetic-optical disks and information on ^{137}Cs dose in the body also play an important role in both retrospective and prospective studies.

All the health examination data have been published bilingually (English and Russian) in the annual report since 1992 [1–4]. The whole-body ^{137}Cs counting data has been published [5,6]. The thyroid findings have also been reported [7–15]. Another publication is a Russian/English textbook, the Chernobyl Sasakawa Radiation Science Series I, II and III [16–18].

Future prospects and plans

Let me reflect on some of the points which led our project to success. First, it was a work of cooperation between Japan and Belarus/Russia/Ukraine: we provided necessary materials and scientific advice; the centers provided the personnel, salaries, as well as energy and passion. Second, we took a direct approach to the areas concerned; Japanese specialists made frequent visits to the centers for their consultation. During the 5-year period, about 330 person/visits were made in total. Since the average length of one visit was 10 days, the total of 330 person/visits amounts to 3,300 days or to a stay of about 9 years if counted for one person! The mutual understanding and friendship developed during these visits became a great asset for the project. Third, we saw children as human beings, suffering in the aftermath of the accident. The children were not the data; the Japanese doctors shared the tears of the mothers.

However, our project, which started as humanitarian assistance to children and other inhabitants of radiocontaminated areas, has gradually come to play an important role in the realm of scientific analysis and, we hope, to provide answers, not only about acute radiation-induced disorders, but also about the problems of how to lead a stable life in the midst of the worst radiocontamination in the history of humankind.

One of the features of radiation injury is "late effects", and so it is necessary to understand that long-term follow-up studies as well as efforts to prevent the scattering of data need to be continued to ensure the effective use of the data. Particular attention should be focused on the need for early diagnosis and prompt treatment of individuals in the high-risk groups.

Although we have various data on 160,000 children, they are not sufficient to elucidate the effects of radioactive contamination caused by the Chernobyl accident on health, particularly thyroid diseases. We hope to focus on this point in our future collaboration.

To conclude, I would like to stress that all the data obtained, including those of our own project, should be shared and analyzed globally so as to turn the tragedy of Chernobyl into a treasure for all humankind.

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Chernobyl Sasakawa Health and Medical Cooperation Project: materials and methods

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Introduction

A total of about 160,000 children were examined in the Chernobyl Sasakawa Health and Medical Cooperation Project, a 5-year health screening project which began in May 1991 and reached completion at the end of April 1996. Since the First Chernobyl Sasakawa Medical Cooperation Symposium held in Mogilev, Belarus, in June 1992, the results obtained at the five institutions (called centers hereafter) involved in the project were presented separately by the respective centers [1—4]. These results were also reported at international conferences whenever the opportunity arose [5—9].

Since the Fifth Chernobyl Sasakawa Medical Cooperation Symposium held in Kiev, Ukraine, in October 1996 was the last one scheduled in the 5-year term of the project, it was decided to pool the data of the five centers in this volume and to analyze them from several viewpoints, i.e., dosimetry, thyroid diseases and hematological abnormalities. The subjects are essentially the same in all of the project reports, and so we present details on the subjects and methods below to avoid unnecessary repetition.

Subjects

The subjects under study are children born between 26 April 1976 and 26 April 1986 and examined from May 1991 to the end of April 1996. (There is a slight difference in the dates of commencement among the centers.) Although a considerable number of children showed disorders and underwent re-examination, the reported results are based on the data of initial examination for each child. Thus the data of about 120,000 children were analyzed (Table 1).

Health screening was conducted by the following five centers under the same protocol and with the same equipment: Gomel Specialized Medical Dispensary, Gomel, Belarus; Mogilev Regional Medical Diagnostic Center, Mogilev, Belarus; Klincy City Children's Hospital, Klincy, Bryansk, Russian Federation; Kiev

Table 1. Number of study subjects by region, sex and year of examination.

Region	Sex	Year of examination						Total
		1991	1992	1993	1994	1995	1996	
Gomel	Boys	1035	1573	1603	2679	1963	632	9485
	Girls	1131	1708	1774	2840	2090	634	10177
	Total	2166	3281	3377	5519	4053	1266	19662
Mogilev	Boys	636	2350	3069	2749	1876	983	11663
	Girls	680	2443	3184	2836	2010	965	12118
	Total	1316	4793	6253	5585	3886	1948	23781
Bryansk	Boys	373	1411	4320	2588	841	459	9992
	Girls	332	1552	4226	2576	1075	417	10178
	Total	705	2963	8546	5164	1916	876	20170
Ukraine	Boys	692	971	3367	4028	3249	955	13262
	Girls	719	1094	3789	4400	3456	973	14431
	Total	1411	2065	7156	8428	6705	1928	27693
Zhitomir	Boys	645	1827	2668	3719	3328	1503	13690
	Girls	844	2175	3169	4067	3491	1597	15343
	Total	1489	4002	5837	7786	6819	3100	29033
Total	Boys	3381	8132	15027	15763	11257	4532	58092
	Girls	3706	8972	16142	16719	12122	4586	62247
	Total	7087	17104	31169	32482	23379	9118	120339

Regional Hospital No. 2, Kiev, Ukraine; and Korosten Inter-Area Medical Diagnostic Center, Korosten, Zhitomir, Ukraine. The location of these five centers is shown in Fig. 1.

The staff of each center made enormous efforts to examine as many children as possible, and the place of residence of the children examined extended to almost all the districts of the area administrated by each center (Fig. 2).

Measurement of whole-body ^{137}Cs concentration

To determine whole-body ^{137}Cs concentration, we used a γ-spectrometer Model-101 equipped with a collimator (Aloka, Tokyo). The results of measurements were processed by the software installed in the computer.

Energetic calibration of the γ-spectrometer with a standard source of ^{137}Cs and ^{60}Co was performed first. This procedure facilitated the estimation of errors caused by varying the parameters of the spectrometer amplifier and thus promoted the achievement of steady results. Measurement of external background without a phantom was conducted next. To correct the results of measurement of body γ-radiation, the value of the external background was subtracted from the readings of the unit. The next step was the measurement of radiation background using phantoms made from Lucite plates 5, 10, 15 and 20 cm in thickness.

After these preparatory procedures, the whole-body ^{137}Cs concentration was

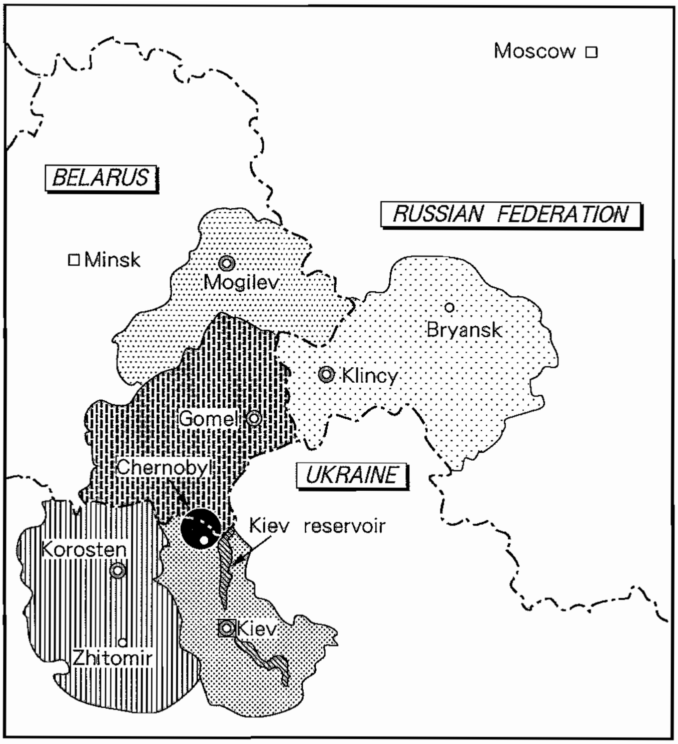

Fig. 1. Map showing the five regions. The locations of the five centers are shown with double circles.

measured. The subject sits in front of the collimator while the operator inputs personal data such as body weight, height, and size of chest and then performs the measurement (Fig. 3) [10]. The results of these measurements are stored in the computer and printed.

Thyroid examinations

The complete examination of the thyroid gland consisted of an ultrasound examination, determination of the serum free thyroxine (T_4) and thyroid-stimulating hormone (TSH) levels, and titers of antimicrosome antibody (AMC) and antithyroglobulin antibody (ATG). The data from the first screening were evaluated by endocrinologists.

Ultrasound examinations were performed with an Aloka SSD-520 and Aloka-630 (Aloka, Tokyo). A quantitative and qualitative analysis of the state of the thyroid and surrounding tissues, blood vessels and lymph nodes was carried out. Using an arch-automatic ultrasonographic instrument, Aloka-SSD 520, with a 7.5-MHz scanning probe, thyroid volume, position, structure, echogenity and the presence of pathologic structures (such as nodules, cysts and congenital abnormalities) were examined. In children with abnormal echography findings,

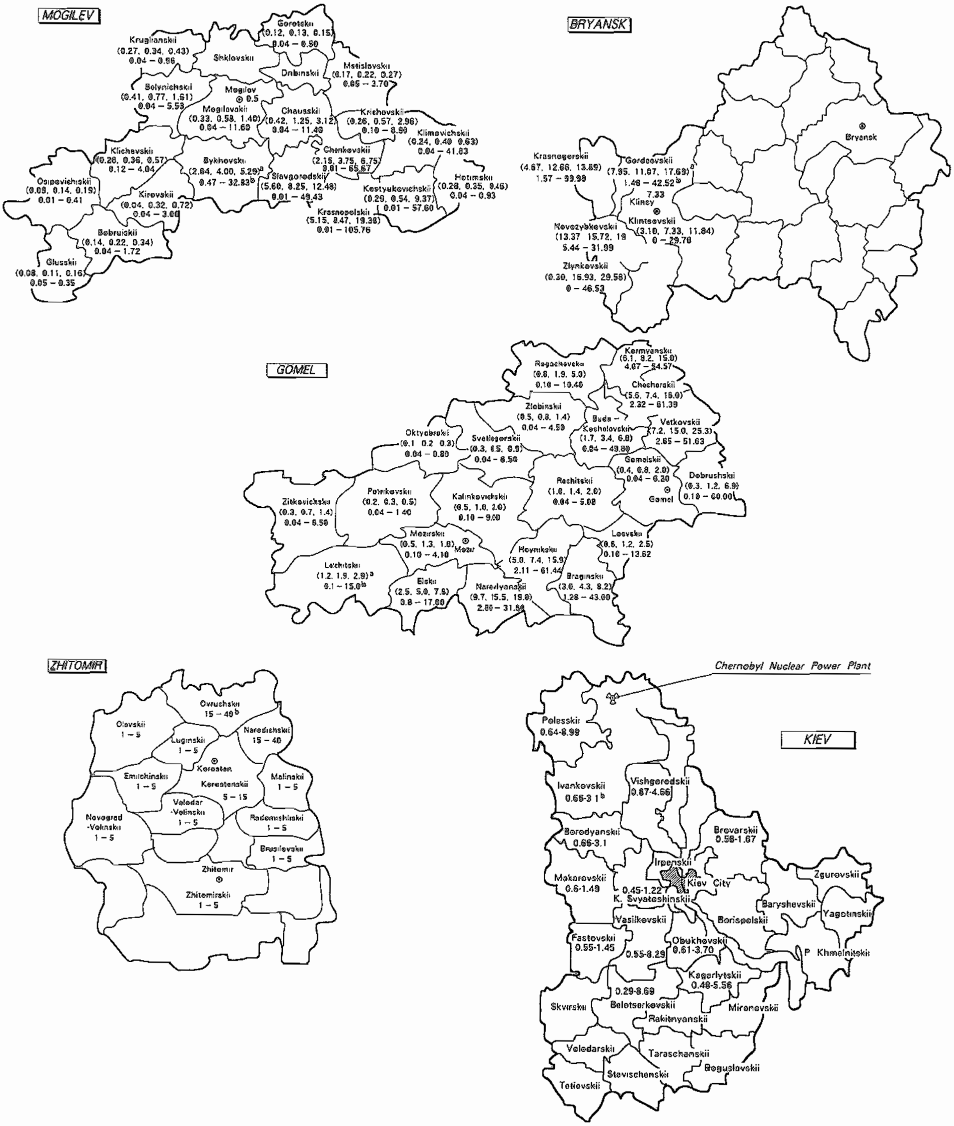

Fig. 2. ^{137}Cs contamination levels (Ci/km^2) in the districts of Gomel (as measured in 1992), Mogilev (as measured in 1992), Bryansk (as measured in 1991), Kiev (as measured in 1994) and Zhitomir (as measured in 1992) regions. [a]The triplets give the 25th, 50th and 75th sample percentiles of contamination levels. [b]Minimum and maximum levels of contamination.

fine-needle aspiration biopsy was performed to confirm diagnoses.

Measurement of thyroid volume was performed as follows: images of 11 cross-sections of the thyroid were recorded at 5-mm intervals on an optic disc, then the total volume was calculated by computerized digitizer. The accuracy of the method in the measurement of thyroid volume has already been established [11].

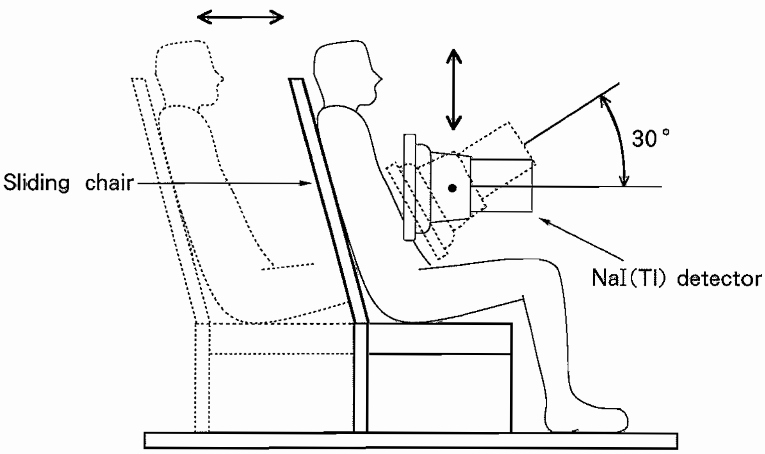

Fig. 3. Side view of the chair-type counter. The whole-body ^{137}Cs count is estimated by this system. The angle and height of NaI(Tl) detector are adjustable. The back and seat of the sliding chair are shielded with lead plates. (Reproduced from Hoshi et al. [10] with permission from the Health Physics Society.)

The criterion for goiter is a thyroid volume exceeding the volume (LIMIT) calculated by this formula:

$$\text{LIMIT} = 1.7 \times 10^{0.013 \times \text{age} + 0.0028 \times \text{height}} \times (\text{body weight})^{0.15},$$

where age is the age of the child in years at the time of the examination, height is the height of the child in centimeters and body weight is the weight of the child in kilograms. The formula was derived by a statistical technique of model selection and linear regression on the basis of findings in 386 boys and 415 girls who were examined at the Mogilev Regional Medical Diagnostic Center [12]. These children were 5 to 15 years of age at the time of the examination and living in areas that were not iodine deficient and where the ^{137}Cs contamination level was less than 1 Ci/km^2, and they had whole-body ^{137}Cs counts less than 50 Bq/kg and showed no abnormalities in the thyroid examination.

The serum free T_4 and TSH levels were determined with an Amerlite hormone analyzer (Amersham, Tokyo) using the immunometric technique based on enhanced luminescence.

Titers of AMC and ATG were determined by the reaction of indirect hemagglutination using commercial diagnostic kits (Fujirevio, Tokyo).

The urinary iodine concentration was measured at Mogilev and Kiev centers for children examined at the five centers using an AutoAnalyzer II system (Bran+Luebbe, Nordersted, Germany). This system is sensitive enough to detect 0.1 μg/dl of urinary iodine in a urine sample of 500 μl [13].

Hematological studies

Peripheral blood tests were conducted with K-1000 and NE-7000 hemoanalyzers (Sysmex, Kobe). Quantitative determination was carried out for the following eight parameters: 1) white blood cell count (WBC); 2) red blood cell count (RBC); 3) hemoglobin concentration (Hb); 4) hematocrit (Ht); 5) mean corpuscular volume (MCV); 6) mean corpuscular hemoglobin (MCH); 7) mean corpuscular hemoglobin concentration (MCHC); and 8) platelet count (PLT). Peripheral blood smears were stained by the May-Grünwald-Giemsa method. The differential leukocyte count was carried out with an Olympus microscope. Serum ferritin level was measured by the immunometric technique. We derived the normal range of these parameters from a minor modification of Wintrobe's textbook example.

Data quality control and statistical analysis

The medical examinations consist of an interview, physical examination and data input. Since errors or bias can occur at any of these steps, we developed a questionnaire easily understandable for both children and parents as a way to minimize the variation in responses due to different interviewers. Moreover, the questionnaire was designed to make the coding of responses unnecessary and thus to facilitate data input (Suppl. 1). The results of the physical examinations were recorded on a special form similar to that used for the questionnaire (Suppl. 2).

All of the data are managed on a relational database developed by the Mogilev Regional Medical Diagnostic Center using Clipper. Data entry has been conducted using special software which displays on the computer screen a form similar to that used for the questionnaire. Logical and range checks of the data are also conducted with specially developed software which shows the results on the computer screen with various colors corresponding to the levels of error. Thus, the operator can easily input and check the data. Data transfer among the five centers has been conducted by modem.

The traditional way to summarize the quantitative data in the two statistics, i.e., mean and standard deviation, is not adequate unless the data are from a normal or nearly normal distribution [14]. Such a summarization may result in the loss of information and lead to errors. In this project, summarization of data by graphics has been emphasized as the first step of statistical analysis. Box-and-whisker plots, Q-Q plots and others have been used to examine the form of the distribution and the presence of outliers. Advanced statistical methods such as multiple regression analysis and logistic regression analysis were also employed to investigate the data structure more deeply.

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Supplement 1

QUESTIONNAIRE ON IN-DEPTH MEDICAL EXAMINATION

I. Basic information on examination

1. Date of examination — day ☐☐ month ☐☐ year ☐☐
2. Place of examination ______________________

II. Subject's identification

1. Personal identification number assigned in the given bus ☐☐☐☐☐☐☐☐☐☐
2. Personal identification number assigned by the government ☐☐☐☐☐☐☐☐☐☐☐☐
3. Identification card
   - 3-1. Type of card
     1 ☐ passport 2 ☐ birth certificate 3 ☐ military document
   - 3-2. Document series ☐☐☐☐☐☐
   - 3-3. Document number ☐☐☐☐☐☐
   - 3-4. Date of issue — day ☐☐ month ☐☐ year ☐☐
4. Name
   - 4-1. Surname ______________________
   - 4-2. Name ______________________
   - 4-3. Patronymic ______________________
5. Sex 1 ☐ male 2 ☐ female
6. Date of birth — day ☐☐ month ☐☐ year ☐☐
7. Place of birth
   - 7-1. Region (Oblast) ______________________
   - 7-2. District (Rayon) ______________________
   - 7-3. Settlement ______________________

III. Residence

1. Settlement address
   - 1-1. Postal code ______________________
   - 1-2. Region (Oblast) ______________________
   - 1-3. District (Rayon) ______________________
   - 1-4. Settlement ______________________
   - 1-5. Street/House/Block/Flat ____ / ____ / ____ / ____
2. Were you living in the present settlement before the 26th April 1986?
   1 ☐ yes 2 ☐ no
3. If you have moved to the present settlement after the 26th April 1986, please indicate the date of arrival.
   Date of arrival. — day ☐☐ month ☐☐ year ☐☐
4. Where did you come from?
   - 4-1. Region (Oblast) ______________________
   - 4-2. District (Rayon) ______________________
   - 4-3. Settlement ______________________
5. Where were you living when the accident took place?
   - 5-1. Region (Oblast) ______________________
   - 5-2. District (Rayon) ______________________
   - 5-3. Settlement ______________________

IV. Food consumption

1. During the current year, have you been eating any of the following foods from individual farms situated in the present settlement or in a neighboring contaminated settlement ? If yes, please enter a ✓ mark in the relevant boxes.

1-1. meat of cows	1 ☐ yes	2 ☐ no
1-2. milk of cows	1 ☐ yes	2 ☐ no
1-3. Vegetable crops and greens	1 ☐ yes	2 ☐ no
1-4. meat of other cattle	1 ☐ yes	2 ☐ no

2. Do you regularly eat mushrooms picked in territory near contaminated settlements ?

1 ☐ yes 2 ☐ no

3. Do you regularly eat the meat of wild animals killed near contaminated settlements ?

1 ☐ yes 2 ☐ no

V. Animals kept by the family

1. Are there any animals kept by your family ? 1 ☐ yes 2 ☐ no
2. If yes, please enter a ✓ mark in the relevant boxes.

2-1. cow	1 ☐ yes	2 ☐ no
2-2. goat	1 ☐ yes	2 ☐ no
2-3. bird	1 ☐ yes	2 ☐ no
2-4. dog	1 ☐ yes	2 ☐ no
2-5. cat	1 ☐ yes	2 ☐ no
2-6. others	1 ☐ yes	2 ☐ no

VI. Parents' occupation and family size

1. Father's occupation involves mainly
   - 1 ☐ being indoors constantly
   - 2 ☐ field-working
   - 3 ☐ cattle-breeding
   - 4 ☐ machine-operating
   - 5 ☐ work in the individual husbandry
   - 6 ☐ others
2. Mother's occupation involves mainly
   - 1 ☐ being indoors constantly
   - 2 ☐ field-working
   - 3 ☐ cattle-breeding
   - 4 ☐ machine-operating
   - 5 ☐ work in the individual husbandry
   - 6 ☐ others
3. How many people are there in you family ? ☐☐ persons

VII. Family history of disease

1. Has one of your family members ever had a serious disease ?

1 ☐ yes 2 ☐ no 9 ☐ unknown

2. If yes, please enter a ✓ mark in the relevant boxes.

2-1. anemia	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-2. leukemia	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-3. malignant tumor (cancer)	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-4. others	1 ☐ yes	2 ☐ no	9 ☐ unknown

3. How many of your blood relatives have had thyroid diseases?

3-1. Parents (0, 1 or 2. Leave blank if unknown.) ☐ persons

3-2. Uncles and Aunts (Enter 9 if you have no blood-related uncles or aunts, and enter 8 if you have 8 or more uncles and aunts with thyroid diseases. Leave blank if unknown.) ☐ persons

3-3. Siblings (Enter 9 if you have no blood-related siblings, and enter 8 if you have 8 or more siblings with thyroid diseases. Leave blank if unknown.) ☐ persons

4. Do any of your family members have hereditary diseases or congenital abnormalities?

1 ☐ yes 2 ☐ no 9 ☐

Ⅷ. Past history

1. Were you born by a full-term normal delivery? 1 ☐ yes 2 ☐ no

2. Birth weight (grams) ☐☐☐☐ grams

3. Lactation history

1 ☐ fed by mother's milk

2 ☐ fed by powder (and/or cow's) milk

3 ☐ fed by both mother's and powder (and/or cow's) milk

4. Puberty

4-1. Have you experienced the signs of puberty (menstruation, voice change, pubic hair, etc.)?

1 ☐ yes 2 ☐ no 9 ☐

4-2. If yes, please give the age when you experienced these signs. (Enter 99 if the age is unknown.)

☐☐ years old

5. Inoculation

5-1. Have you had any inoculations? 1 ☐ yes 2 ☐ no 9 ☐ unknown

5-2. If yes, please enter a ✓ mark in the relevant boxes.

5-2-1. measles 1 ☐ yes 2 ☐ no 9 ☐ unknown

5-2-2. tetanus 1 ☐ yes 2 ☐ no 9 ☐ unknown

5-2-3. poliomyelitis 1 ☐ yes 2 ☐ no 9 ☐ unknown

5-2-4. mumps 1 ☐ yes 2 ☐ no 9 ☐ unknown

5-2-5. others 1 ☐ yes 2 ☐ no 9 ☐ unknown

6. Tuberculin reaction test

6-1. Have you ever had a tuberculin reaction test?

1 ☐ yes 2 ☐ no 9 ☐ unknown

6-2. If yes, please give the age when the reaction became positive. (Enter 99 if the age is unknown.)

☐☐ years old

7. Disease

7-1. Did you have any serious diseases in the past?

1 ☐ yes 2 ☐ no 9 ☐ unknown

7-2. If yes, please enter a ✓ mark in the relevant boxes.

7-2-1. thyroid diseases 1 ☐ yes 2 ☐ no 9 ☐ unknown

7-2-2. tuberculosis 1 ☐ yes 2 ☐ no 9 ☐ unknown

7-2-3. anemia 1 ☐ yes 2 ☐ no 9 ☐ unknown

7-2-4. blood diseases other than anemia

1 ☐ yes 2 ☐ no 9 ☐ unknown

8. Do you catch a cold easily? 1 ☐ yes 2 ☐ no 9 ☐ unknown
9. If you catch a cold, do you easily recover?
   1 ☐ yes 2 ☐ no 9 ☐ unknown
10. Did you ever have an asthma attack?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
11. Do you bleed easily? 1 ☐ yes 2 ☐ no 9 ☐ unknown
12. Have you ever had a skin disease?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
13. Exposure of thyroid
    13-1. Have you been measured for thyroid exposure?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
    13-2. If you have been measured for thyroid exposure, indicate the date of measurement and the dose.
    13-2-1. Date of measurement day ☐☐ month ☐☐ year ☐☐
    13-2-2. Dose (μSv) ☐☐☐☐☐☐☐ μSv
14. Past history of thyroid diseases
    14-1a. Have you ever been diagnosed as having Basedow's disease?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
    14-1b. If yes, please give the age at the first diagnosis. (Enter 99 if the age is unknown.) ☐☐ years old
    14-2a. Have you ever been diagnosed as having thyroid cancer?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
    14-2b. If yes, please give the age at the first diagnosis. (Enter 99 if the age is unknown.) ☐☐ years old
    14-3a. Have you ever been diagnosed as having chronic thyroiditis?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
    14-3b. If yes, please give the age at the first diagnosis. (Enter 99 if the age is unknown.) ☐☐ years old
    14-4a. Have you ever been diagnosed as having hypothyroidism?
    1 ☐ yes 2 ☐ no 9 ☐ unknown
    14-4b. If yes, please give the age at the first diagnosis. (Enter 99 if the age is unknown.) ☐☐ years old
    14-5a. Have you ever been diagnosed as having adenomatous goiter?
    1 ☐ yes 2 ☐ no 9 ☐
    14-5b. If yes, please give the age at the first diagnosis. (Enter 99 if the age is unknown.) ☐☐ years old
    14-6a. Have you ever been diagnosed as having any other thyroid diseases?
    1 ☐ yes 2 ☐ no 9 ☐
    14-6b. If yes, please give the name of the disease and the age at the first diagnosis. (Enter 99 if the age is unknown.)
    The name of the disease is ______________ ☐☐ years old

15. Therapeutic history of thyroid disease

15-1a. Have you ever undergone thyroid surgery?
1 ☐ yes 2 ☐ no 9 ☐ unknown

15-1b. If yes, please give the age at the operations.
(Enter 99 if the age is unknown.) ☐☐ years old

15-2a. Have you ever had your thyroid treated with radioisotope iodine 131 (^{131}I)?
1 ☐ yes 2 ☐ no 9 ☐ unknown

15-2b. If yes, please give the age at the treatment.
(Enter 99 if the age is unknown.) ☐☐ years old

15-3a. Have you ever received any thyroid hormones?
1 ☐ yes 2 ☐ no 9 ☐ unknown

15-3b. If yes, please give the age at the first administration.
(Enter 99 if the age is unknown.) ☐☐ years old

15-3c. Do you still take thyroid hormones?
1 ☐ yes 2 ☐ no 9 ☐ unknown

15-4a. Have you ever received any antithyroid medicine?
1 ☐ yes 2 ☐ no 9 ☐ unknown

15-4b. If yes, please give the age at the first administration.
(Enter 99 if the age is unknown.) ☐☐ years old

15-5a. Have you ever received iodide therapy?
1 ☐ yes 2 ☐ no 9 ☐ unknown

15-5b. If yes, please give the age at the first treatment.
(Enter 99 if the age is unknown.) ☐☐ years old

15-5c. Do you still receive the therapy? 1 ☐ yes 2 ☐ no 9 ☐ unknown

15-6a. Have you ever had your thyroid treated in some other way?
1 ☐ other type of medicine 2 ☐ other type of therapy
3 ☐ no 9 ☐ unknown

15-6b. If yes, please give the type of treatment and the age at the first treatment. (Enter 99 if the age is unknown.)
The type of treatment is ____________ ☐☐ years old

15-6c. Are you still under treatment? 1 ☐ yes 2 ☐ no 9 ☐ unknown

16. Have you been taking iodine tablets to supply iodine?
1 ☐ yes 2 ☐ no 9 ☐ unknown

17. Have you been taking iodinated salt? 1 ☐ yes 2 ☐ no 9 ☐ unknown

18. X-ray examination

18-1. Have you ever had a chest X-ray examination?
1 ☐ yes 2 ☐ no 9 ☐ unknown

18-2. Have you ever had a dental X-ray examination?
1 ☐ yes 2 ☐ no 9 ☐ unknown

18-3. Have you ever had other X-ray examinations?
1 ☐ yes 2 ☐ no 9 ☐ unknown

19. Have you ever had a bone marrow examination?
1 ☐ yes 2 ☐ no 9 ☐ unknown

IX. Recent health conditions

1. Have you had any complaints in the last two months?

   1 ☐ yes   2 ☐ no   9 ☐ unknown

2. If yes, please enter a ✓ mark in the relevant boxes.

2-1.	fatigue	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-2.	fever	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-3.	loss of appetite	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-4.	predisposition to hemorrhage	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-5.	tonsillitis	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-6.	loss of hair	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-7.	increase in weight	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-8.	weight loss	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-9.	abdominal pain	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-10.	diarrhea	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-11.	constipation	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-12.	joint pain	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-13.	blood in stool	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-14.	blood in urine	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-15.	failing eyesight	1 ☐ yes	2 ☐ no	9 ☐ unknown
2-16.	others	1 ☐ yes	2 ☐ no	9 ☐ unknown

Supplement 2

RESULTS OF IN-DEPTH MEDICAL EXAMINATION

Ⅰ. Basic information on examination

1. Date of examination — day ☐☐ month ☐☐ year ☐☐

2. Place of examination ________________________

Ⅱ. Subject's identification

1. Personal identification number assigned in the given bus ☐☐☐☐☐☐☐☐☐☐

2. Personal identification number assigned by the government ☐☐☐☐☐☐☐☐☐☐☐☐

Ⅲ. Dosimetry data

1. Cs-137 activity according to the spectrometry measurement (whole body counting) (Bq)
☐☐☐☐☐☐☐ Bq

2. Mean dose-rate at the height of one meter from unprocessed soil (μSv/h)
☐☐☐.☐☐☐ μSv/h

Ⅳ. Physical data

1. Height (cm) ☐☐☐ cm
2. Weight (kg) ☐☐☐ kg
3. Chest circumference (cm) ☐☐☐ cm
4. Chest thickness (cm) ☐☐ cm
5. Systolic blood pressure (mmHg) ☐☐☐ mmHg
6. Diastolic blood pressure (mmHg) ☐☐☐ mmHg
7. Pulse (beats/min) ☐☐☐ beats/min

Ⅴ. Thyroid ultra scanning investigation (USI) data

1. Was USI conducted? (1 – yes ; 2 – no) ☐
If no, the following items of this section do not need to be encoded.

2. Thyroid gland volume (cm^3 ; encode as 999.9 if the volume was not determined)
☐☐☐.☐ cm^3

3. Nodules (1 – isoechogene ; 2 – hypoechogene ; 3 – hyperchogene ; 4 – mixed ; 5 – no nodules) ☐

4. Halo of nodule (1 – present ; 2 – absent) ☐

5. Number of nodules (1 – one ; 2 – two ; 3 – three ; 4 – four or more ; 9 – questionable) ☐

6. Cystic lesions of thyroid (1 – clear hypoechogene ; 2 – cystic degeneration ; 3 – no) ☐

7. Multiple fine cystic degeneration (1 – present ; 2 – absent) ☐

8. Number of cystic lesions (1 – one ; 2 – two ; 3 – three ; 4 – four or more ; 9 – questionable) ☐

If nodules or cystic lesions were found, the next item is not encoded.

9. Echogenity of thyroid (1 – normal ; 2 – diffuse decrease ; 3 – diffuse increase ; 4 – local decrease ; 5 – local increase ; 6 – mixed) ☐

10. Calcification (1 – present ; 2 – absent) ☐

11. Anomaly (1 – aplasy ; 2 – hypoplasy ; 3 – local structure ; 4 – no) ☐

VI. Thyroid function tests data

1. Were the tests conducted ? (1 – yes ; 2 – no) ☐
   If no, the following items of this section do not need to be encoded.

2. Free T_4 ☐☐☐.☐ pmol/L

3. TSH ☐☐☐.☐ μU/mL

4. Microsome test ☐☐☐☐ × 100

5. Thyroid test ☐☐☐☐ × 100

VII. Urinary iodine and creatinine data

1. Was urine examination conducted ? (1 – yes ; 2 – no) ☐
   If no, the following items of this section do not need to be encoded.

2. Urinary iodine ☐☐☐☐.☐ μg/dL

3. Urinary creatinine ☐☐☐.☐ mg/dL

VIII. Aspiration biopsy

Was aspiration biopsy of thyroid gland conducted ? (1 – yes ; 2 – no) ☐

IX. Hematologic indices brought out on K-1000 analyzer

1. Was the analysis conducted ? (1 – yes ; 2 – no) ☐

   If no, the following items of this and the next sections do not need to be encoded.

2. Leukocytes (WBC) ($\times 10^9$/L) ☐☐☐.☐ $\times 10^9$/L

3. Erythrocytes (RBC) ($\times 10^{12}$/L) ☐.☐☐ $\times 10^{12}$/L

4. Hemoglobin (Hb) (g/L) ☐☐☐ g/L

5. Hematocrit (Ht) ☐.☐☐☐

6. Mean corpuscular volume (MCV) (fl) ☐☐☐.☐ fl

7. Mean corpuscular hemoglobin (MCH) (pg) ☐☐.☐ pg

8. Mean corpuscular hemoglobin concentration (MCHC) (g/L) ☐☐☐ g/L

9. Platelet (PLT) ($\times 10^9$/L) ☐☐☐☐ $\times 10^9$/L

X. Analysis of leukocytes (%)

1. Eosinophil	□□.□ %
2. Basophil	□□.□ %
3. Band neutrophil	□□.□ %
4. Polymorphonuclear neutrophil	□□.□ %
5. Lymphocyte	□□.□ %
6. Monocyte	□□.□ %
7. Blast (include Lymphoblast and Myeloblast)	□□.□ %
8. Promyelocyte	□□.□ %
9. Myelocyte	□□.□ %
10. Metamyelocyte	□□.□ %
11. Plasma cell	□□.□ %
12. Atypical lymphocyte	□□.□ %
13. Others	□□.□ %
14. Erythroblast (per 100 leukocytes)	□□ /100 leukocytes

Chernobyl: A Decade
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Findings of the Chernobyl Sasakawa Health and Medical Cooperation Project: ^{137}Cs concentration among children around Chernobyl

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Introduction

A large amount of work associated with ^{137}Cs content measurements in the bodies of children residing around Chernobyl has been carried out by five diagnostic centers located in the Bryansk, Kiev, Zhitomir, Gomel and Mogilev regions since the start of the Chernobyl Sasakawa Health and Medical Cooperation Project.

As a result of the accident at the Chernobyl nuclear power station, vast territories of the above-mentioned regions were contaminated with various radionuclides. Among these, the most biologically significant isotopes were iodine, cesium, strontium and transuranian elements.

^{131}I was the major factor of internal exposure during the first months after the accident, and ^{131}I accumulated in the thyroid was the cause of irradiation.

After a natural decay of short- and moderately short-lived radionuclides the main risk of internal exposure is due to radionuclides with long half-lives, especially ^{137}Cs because children were exposed (and continue to be exposed) to radiation through consumption of contaminated foodstuffs.

The impact of external γ-radiation on the bodies of children is also attributable mainly to the presence of ^{137}Cs since the time of exposure.

In view of the above-mentioned facts, considerable attention was paid to the problem of determining ^{137}Cs concentration in the body of children within the framework of the project. The ^{137}Cs whole-body content has been a critical constituent of an individual dose formation since the time of the Chernobyl disaster.

Figure 1 shows the extent of radioactive cesium contamination in the Bryansk, Kiev, Zhitomir, Gomel and Mogilev regions [1]. The territories with different levels of contamination density ranging from 1 to 5 Ci/km^2, from 5 to 15 Ci/km^2 and higher than 15 Ci/km^2 are shadowed. It should be noted that the high-

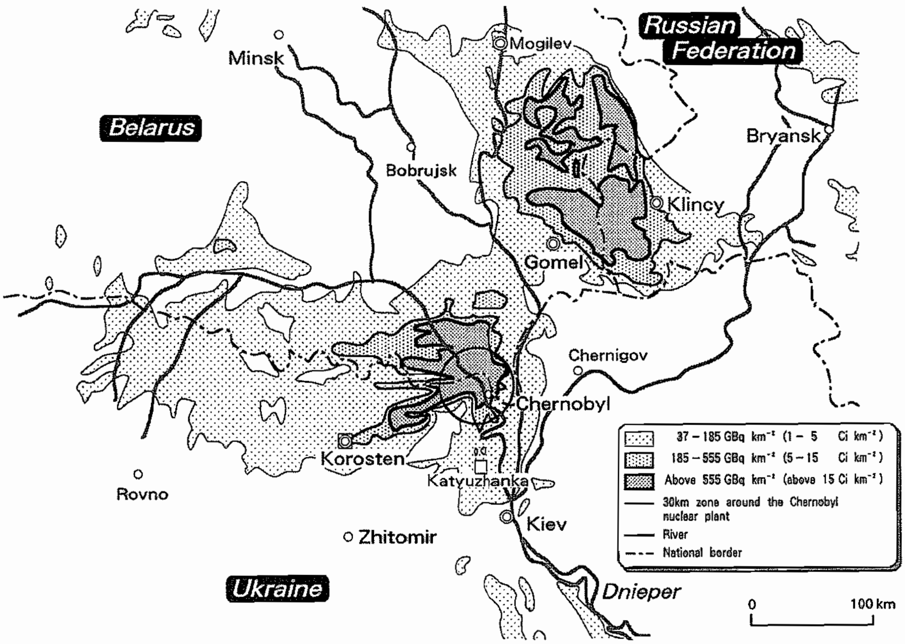

Fig. 1. Map showing the contamination level of radioactive cesium in the Bryansk, Kiev, Zhitomir, Gomel and Mogilev regions. (Reproduced from Hoshi et al. [1] with permission from the Health Physics Society.)

est contamination density by Cs isotopes is registered in the Braginskii, Hoynikskii and Vetkovskii districts of the Gomel region; the Krasnopolskii and Cherikovskii districts of the Mogilev region; the Zlynkovskii and Gordeyevskii districts of the Bryansk region; the Polyesskii and Ivankovskii districts of the Kiev region; and the Ovruchskii and Narodichskii districts of the Zhitomir region.

We have omitted a description of the subjects and methods as they are presented elsewhere in this volume (pp. 23–28).

Results

A total of 119,306 children were measured for whole-body ^{137}Cs counts at the five centers from May 1991 to April 1996 (Table 1). Of these children, 18,883 were from the Gomel region, 23,779 were from the Mogilev region, 19,844 were from the Bryansk region, 27,721 were from the Kiev region and 29,079 were from the Zhitomir region.

As indicated in Table 1, the whole-body ^{137}Cs counts per body weight were less than 50 Bq/kg in about 79% and greater than 100 Bq/kg in only about 8% of the children.

The distribution of ^{137}Cs-specific content in the body by sex and age is shown in Fig. 2 for children examined in 1995 and 1996. The children with a whole-

Table 1. Distribution of whole-body ^{137}Cs counts per body weight in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Center	Whole-body ^{137}Cs counts per body weight (Bq/kg)					Total
	0—50	50—100	100—200	200—500	500—	
Gomel	14211	3136	1195	302	39	18883
Mogilev	21441	1821	413	94	10	23779
Klincy	9980	4986	3032	1585	261	19844
Kiev	26283	1083	272	69	14	27721
Korosten	21812	4625	1940	650	52	29079
Total	93727	15651	6852	2700	376	119306

body ^{137}Cs count less than the detection limit, i.e., 540 Bq, were excluded from the figure. The median of the ^{137}Cs concentration values was under 50 Bq/kg, and no significant difference by age was observed in either boys or girls.

Figure 3 presents the distribution of the whole-body ^{137}Cs counts per body weight by place of residence among children examined in 1995 and 1996. The plot shows that the most intensive accumulation of ^{137}Cs in the bodies of children was observed in the Bryansk region, where the median ^{137}Cs concentration was

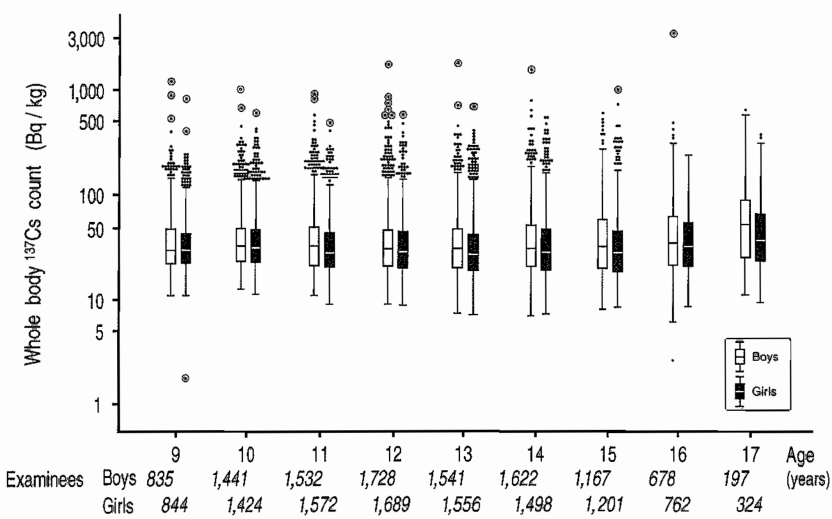

Fig. 2. Box-and-whisker plots of whole-body ^{137}Cs counts per body weight by age and sex in children aged 0—10 years at the time of the accident and examined at the five centers from January 1995 to April 1996. The children with a whole-body ^{137}Cs count less than the detection limit, i.e., 540 Bq, were excluded from the figure. The bottom and top ends of the box and the bar inside the box correspond to the 25th, 75th and 50th sample percentiles, respectively. The black dot and the double circle with black dot represent extreme values called "outside" and "far out," respectively.

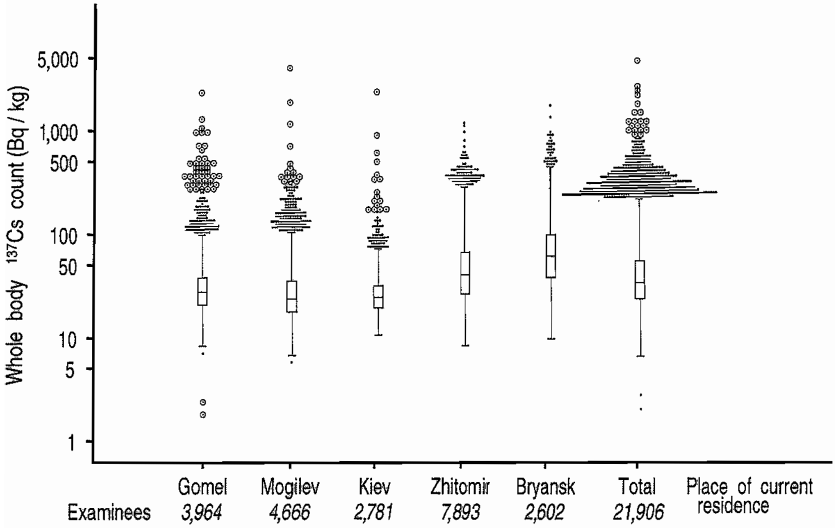

Fig. 3. Box-and-whisker plots of whole-body ^{137}Cs counts per body weight by place of current residence in children aged 0—10 years at the time of the accident and examined at the five centers from January 1995 to April 1996. See Fig. 2 for details of the plots.

45 Bq/kg. The lowest accumulation of ^{137}Cs was registered in the Kiev region, where the median was 20 Bq/kg. Figure 3 also presents the distribution of ^{137}Cs-specific content for 21,906 children examined at all five centers. The highest concentration of ^{137}Cs was 3,100 Bq/kg and was registered in the Mogilev region where the median value was 25 Bq/kg.

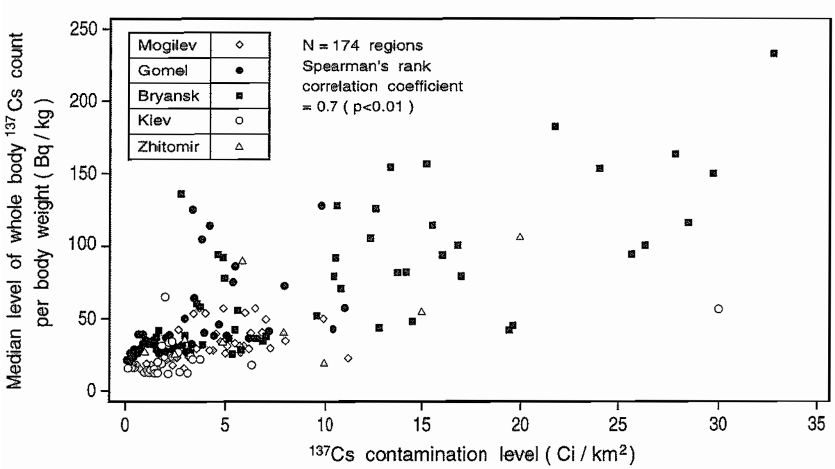

Fig. 4. Median level of whole-body ^{137}Cs counts per body weight and contamination level in the place of current residence in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Figure 4 presents the relationship between the median level of ^{137}Cs concentration in the bodies of children (Bq/kg) and the contamination level (Ci/km^2) in the place of current residence. The locations of residence of the 119,306 children examined at five diagnostic centers were grouped into regions according to their contamination level. The regions where the number of children was less than 50 were excluded, and as a result 174 remained. Spearman's rank correlation coefficient was 0.7, which is statistically significant ($p < 0.01$). A high median value of ^{137}Cs concentration level was registered in children from the Bryansk and Gomel regions although the contamination level in their place of residence is relatively low. An opposite tendency was observed in the Kiev region, i.e., low values of median ^{137}Cs concentration were registered in locations with high contamination levels.

Summary

1. ^{137}Cs concentration was investigated on the basis of about 120,000 measurements conducted from May 1991 to April 1996 among children aged 0–10 years at the time of the accident.
   (i) ^{137}Cs concentration was under 50 Bq/kg in about 79% but exceeded 100 Bq/kg in only about 8% of the children.
   (ii) A significant positive correlation was observed between median level of ^{137}Cs concentration and contamination level in the place of current residence.
   (iii) However, no significant difference by age was observed in the ^{137}Cs concentration.
2. The reconstruction of individual doses is an important theme for future studies.

Conclusions

The whole-body ^{137}Cs count observed in 93,727 (ca. 79%) of the 119,306 children was less than 50 Bq/kg, which corresponds to the annual effective dose equivalent of 45 μSv/year (2–3% of the annual natural radiation in the environment). However, the highest level of 3,100 Bq/kg observed in a child in the Mogilev region corresponds to about 2.8 times the public dose limit of 1 mSv/year recommended by the International Commission on Radiological Protection in 1990 [2]. Furthermore, 376 (0.3%) children showed a level of 500 Bq/kg or more, which corresponds to an annual effective dose equivalent exceeding the average annual effective dose equivalent of exposure from internal natural sources in a member of the American population [2].

The above-mentioned fact and the significant positive correlation observed between the whole-body ^{137}Cs count and the contamination level in the place of current residence indicate the necessity for a long-term health surveillance of children living in areas with a relatively high contamination level.

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Hematological findings of the Chernobyl Sasakawa Health and Medical Cooperation Project

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Introduction

In this presentation, we will focus on the following three points:
1) the change of hematological parameters by age and sex;
2) the prevalence of hematological abnormalities; and
3) the correlation between the hematological abnormalities and radio-contamination level.

This report is a summarization of the results on 118,773 children examined at the five centers from May 1991 to April 1996 (Table 1). We omit the description of the subjects and methods which are presented elsewhere in this volume (pp. 23–38).

Results

Blood cell counting

The hemoglobin (Hb) level in children by age and sex is shown in Fig. 1. The median Hb in both sexes was within normal limits between 5 and 17 years old. The Hb level increased physiologically in boys after 10 years of age. Conversely, it decreased in girls older than 14 years of age. This change is likely to be due to an iron-deficient state associated with puberty. An abnormally low hemoglobin level was frequently observed in girls older than 14 years of age.

The median of mean corpuscular volume (MCV) was lower in boys than in girls in all age groups (Fig. 2). Microcytic erythrocytes were observed in both boys and girls of all ages.

The serum ferritin level of each age group was examined in 571 children with-

Table 1. Number of children aged 0—10 at the time of the accident receiving hematological examinations at the five centers from May 1991 to April 1996.

Center (region)	Number of children examined
Gomel (Gomel, Belarus)	19055
Mogilev (Mogilev, Belarus)	23313
Klincy (Bryansk, Russian Federation)	19932
Kiev (Kiev, Ukraine)	27445
Korosten (Zhitomir, Ukraine)	29028
Total	118773

out any abnormal hematological data. The ferritin level in girls, shown with a circle in Fig. 3, between 13 and 16 years of age was lower than that in boys, which might be attributable to iron loss by menstruation. This phenomenon corresponded with the decreased median Hb level in girls over 13 years of age (Fig. 1).

The median of leukocyte count (white blood cell count, WBC) was within normal limits (Fig. 4). The decrease in WBC until 8 years of age was caused by the decreased lymphocyte count. Absolute lymphocyte count leveled off in both sexes from 7 years of age. On the other hand, WBC increased after 12 years of age due to increased neutrophils, and neutrophil count dominated lymphocyte count.

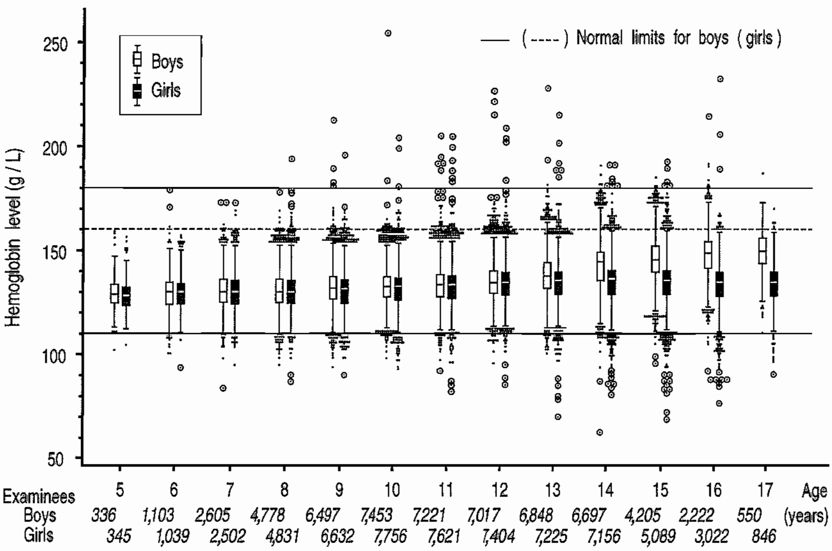

Fig. 1. Box-and-whisker plots of hemoglobin level by age and sex in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The bottom and top ends of the box and the bar inside the box correspond to the 25th, 75th and 50th sample percentiles, respectively. The black dot and the double circle with black dot represent extreme values called "outside" and "far out", respectively.

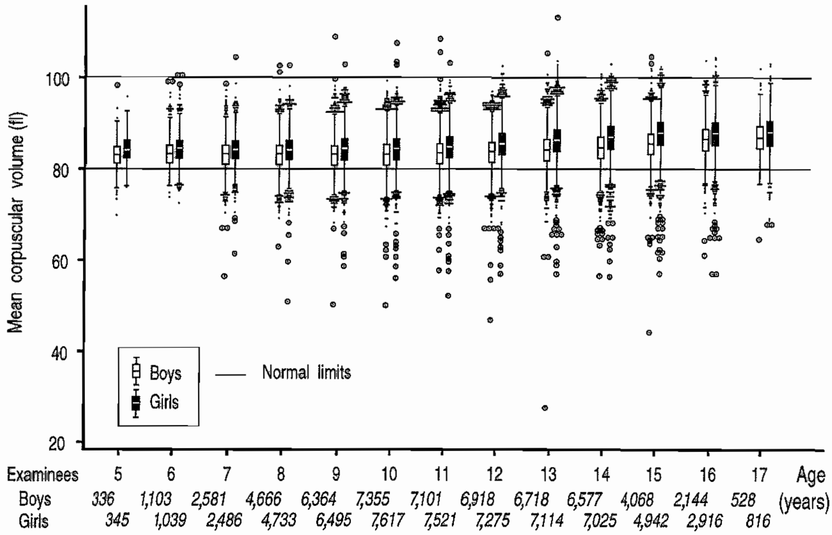

Fig. 2. Box-and-whisker plots of mean corpuscular volume by age and sex in children aged 0–10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. (See Fig. 1 for details.)

Leukocytosis, which consists of neutrophilia or lymphocytosis or both, was found frequently in each age group. Most of the cases were attributable to upper respiratory or bowel inflammatory diseases in children at the time of the examinations.

The platelet count in children by age and sex is shown in Fig. 5. The median

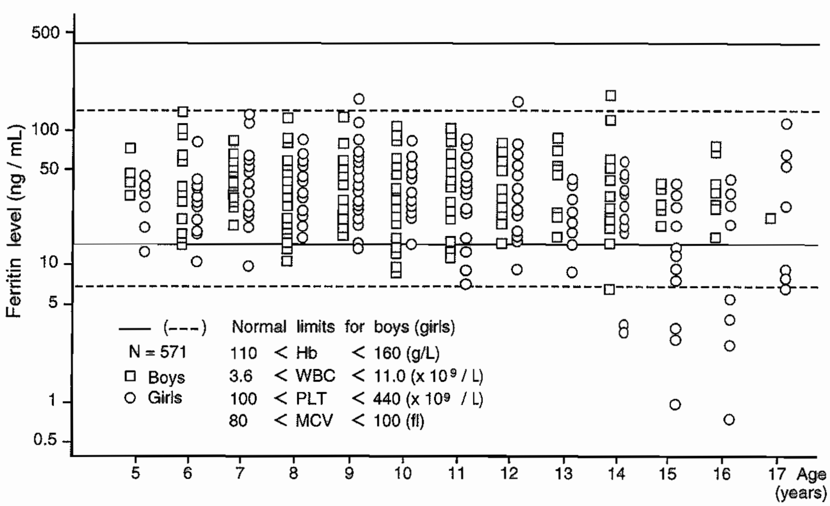

Fig. 3. Serum ferritin level by age and sex in hematologically normal children aged 0–10 years at the time of the accident and examined at the five centers from May 1991 to December 1994.

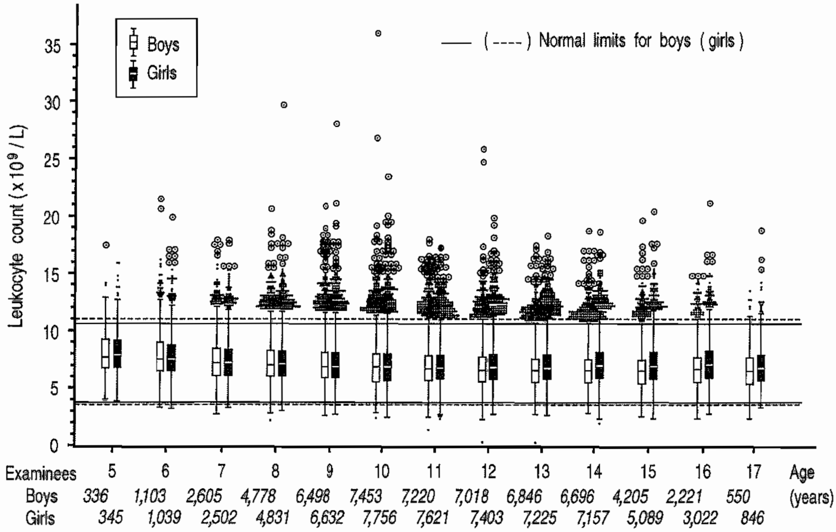

Fig. 4. Box-and-whisker plots of leukocyte count by age and sex in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. (See Fig. 1 for details.)

platelet value decreased gradually with age, and boys between 16 and 17 years of age showed the lowest platelet value. Many thrombocytosis cases were observed from 7 to 16 years of age in both sexes. This tendency was considered to be reactive, since these were associated with infection or an iron deficiency state.

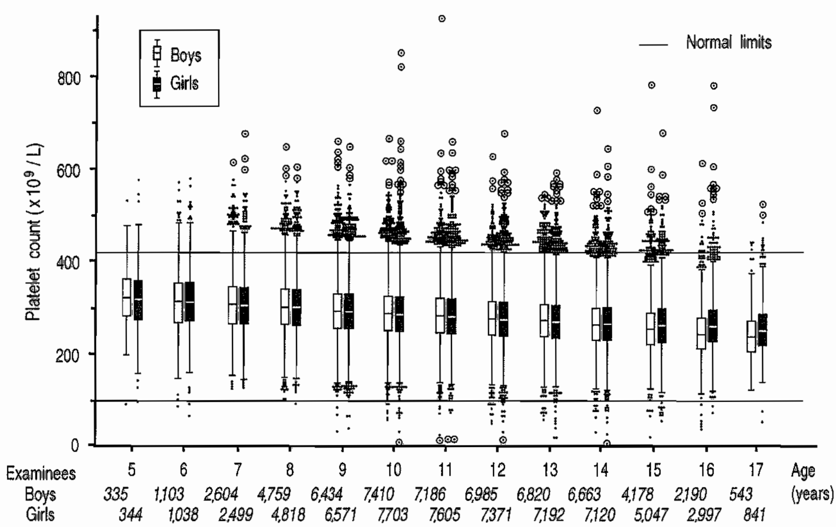

Fig. 5. Box-and-whisker plots of platelet count by age and sex in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. (See Fig. 1 for details.)

Prevalence of hematological abnormalities

The number of hematologically abnormal cases and their prevalence observed at each center are summarized in Table 2. The definition of each abnormality is shown in the first column.

The prevalence of anemia was higher in girls than in boys and ranged from 0.2 to 0.5%. The prevalence was lower in Mogilev and Bryansk than in Kiev, Gomel and Korosten where it was 0.5%. We measured serum ferritin levels in 322 cases. In both boys and girls, more than half of the children showed low serum ferritin, and there was a correlation between the hemoglobin level in the lower range and the serum ferritin level, especially in girls.

The prevalence of leukopenia was 0.2–1.1%. The prevalence was somewhat lower in girls than in boys. The prevalence of leukocytosis was 2.8–4.9%, with no significant difference being noted among five centers or between boys and girls.

The prevalence of thrombocytopenia was as low as 0.06–0.12% and there was no difference between centers or genders. The prevalence of thrombocytosis was 1.0–1.3% and it was not different among centers or between boys and girls.

Eosinophilia was the most frequent hematological abnormality, ranging from 12.2 to 18.9%. No difference in the prevalence was noted between boys and girls. The prevalence seemed to be higher in Bryansk and Korosten where agriculture was a main industry and lower in Mogilev, Kiev, and Gomel where most of the children lived in a city.

The prevalence of anemia by district is shown in Fig. 6. Districts with a high prevalence (50 or more cases per 10,000 children) were observed frequently in the Gomel, Kiev and Zhitomir regions.

As shown in Fig. 7, the prevalence of eosinophilia was high in the rural areas.

Except for anemia and leukopenia, no significant difference by sex was observed in the prevalence of any hematological abnormality (Fig. 8). The prevalence of anemia was significantly ($p < 0.01$) higher in girls (0.53%) than in boys (0.27%), while the prevalence of leukopenia was significantly ($p < 0.01$) lower in girls (0.31%) than in boys (0.72%). Anemia was found in 0.40% in total. Leukopenia and leukocytosis were observed in 0.51 and 3.6%, respectively. Thrombocytopenia and thrombocytosis were observed in 0.09 and 1.2%, respectively. Eosinophilia was found in a high prevalence of 15.0%.

We investigated the annual change in the prevalence of each hematological abnormality from 1991 to 1996. The prevalence of anemia and thrombocytopenia was steady, but the prevalence of thrombocytosis and leukocytosis decreased gradually. On the other hand, leukopenia increased slightly in 1996 (Fig. 9). The prevalence of eosinophilia decreased dramatically from 25 to 11% in 5 years (Fig. 10). This change in prevalence over 5 years involves several factors such as the elevation of economic conditions, moving to uncontaminated areas from agricultural zones, development of health consciousness and improvement of medical conditions. Especially, increased awareness concerning sanitation might

Table 2. Hematological abnormalities by region and sex in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Diagnosis	Region														
	Gomel			Mogilev			Bryansk			Kiev			Zhitomir		
	(19055/15750)			(23313)			(19932)			(27445)			(29028)		
	B	G	%	B	G	%	B	G	%	B	G	%	B	G	%
Anemia Hb < 110 g/l	41	55	0.5	15	39	0.2	15	36	0.3	50	98	0.5	33	98	0.5
Leukopenia B: WBC < 3.8×10^9/l G: WBC < 3.6×10^9/l	61	27	0.5	163	83	1.1	74	37	0.6	75	33	0.4	42	9	0.2
Leukocytosis B: WBC > 10.6×10^9/l G: WBC > 11.0×10^9/l	414	325	3.9	389	296	2.9	299	257	2.8	633	716	4.9	523	474	3.4
Thrombocytopenia PLT < 100×10^9/l	5	6	0.06	10	18	0.12	9	9	0.09	9	12	0.08	16	15	0.11
Thrombocytosis PLT > 440×10^9/l	122	118	1.3	148	157	1.3	107	87	1.0	190	187	1.4	129	157	1.0
Eosinophilia Eo > 0.5×10^9/l	944	980	12.2	1714	1585	14.2	1922	1854	18.9	1715	1877	13.1	2184	2500	16.1

Figures in parentheses are the number of children (boys and girls) examined. In Gomel, eosinophil count was assayed in 15,750 children. B = boys, G = girls, % = percentage of children (boys and girls) with the respective abnormalities.

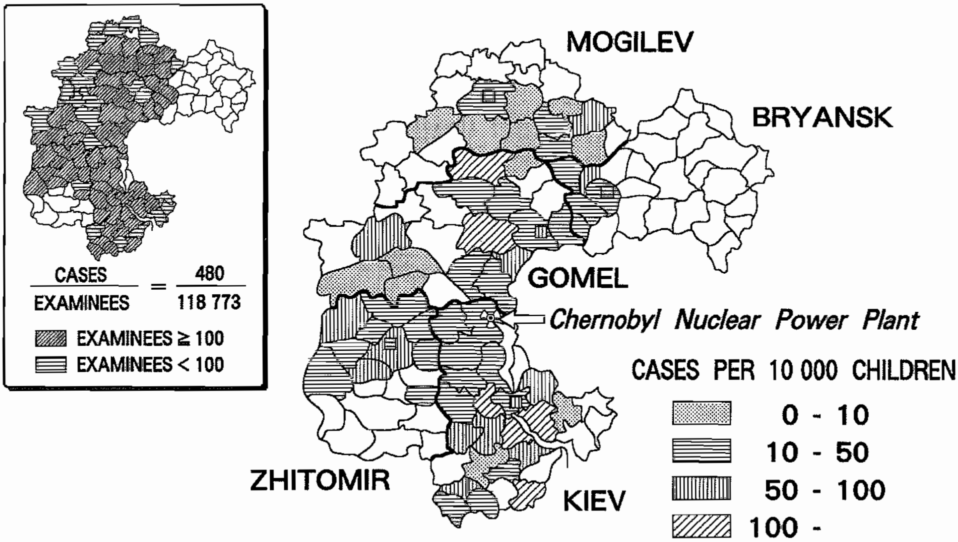

Fig. 6. Prevalence of anemia by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The districts with less than 100 examined children were excluded from the calculation of prevalence.

be involved in the decrease in the chance of infection or eosinophilia.

The relationship between ferritin and Hb levels was investigated among 322 children with an Hb level below 110 g/l. As shown in Fig. 11, the ferritin level

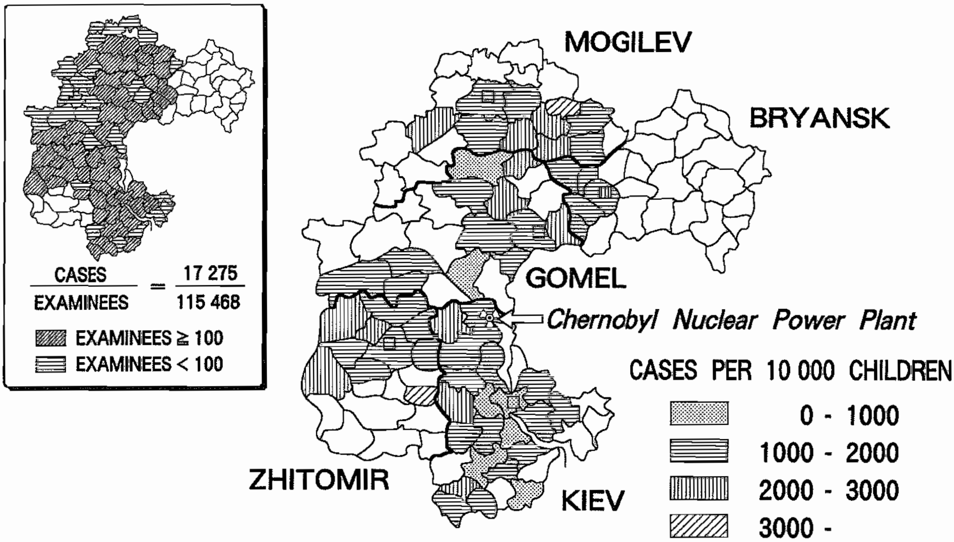

Fig. 7. Prevalence of eosinophilia by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The districts with less than 100 examined children were excluded from the calculation of prevalence.

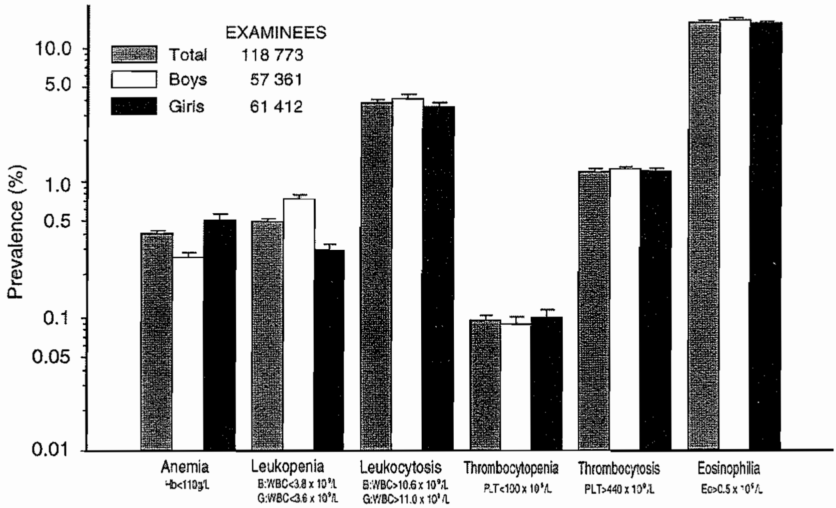

Fig. 8. Prevalence of hematological abnormalities in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The whiskers denote the standard errors.

showed a tendency to decrease with the Hb level. This finding suggests that one-third of the cases of anemia are probably due to an iron deficiency.

All of the children with hematological deviations were invited for re-examination but some of them did not partake. The results are summarized in Table 3. Out of 481 children showing anemia, 295 underwent re-examination. Anemia was not confirmed in 125 cases at the re-examination because of iron supplements. 119 children showed iron-deficiency anemia, one child showed anemia

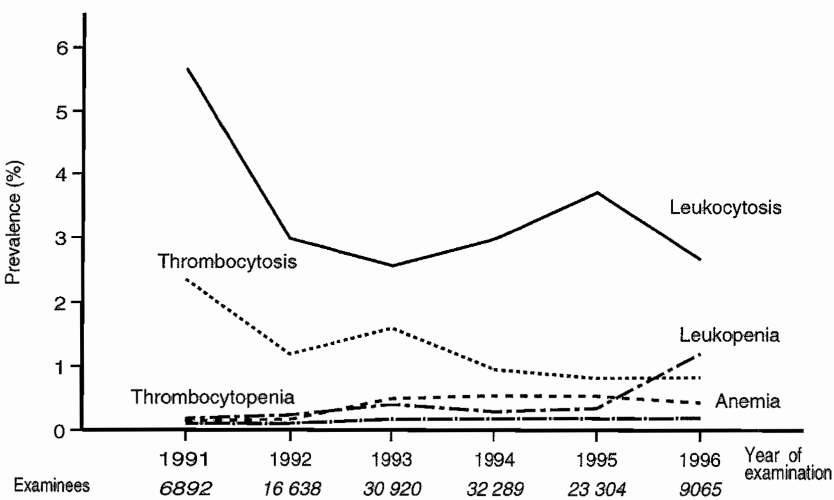

Fig. 9. Prevalence of hematological abnormalities by year of examination in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

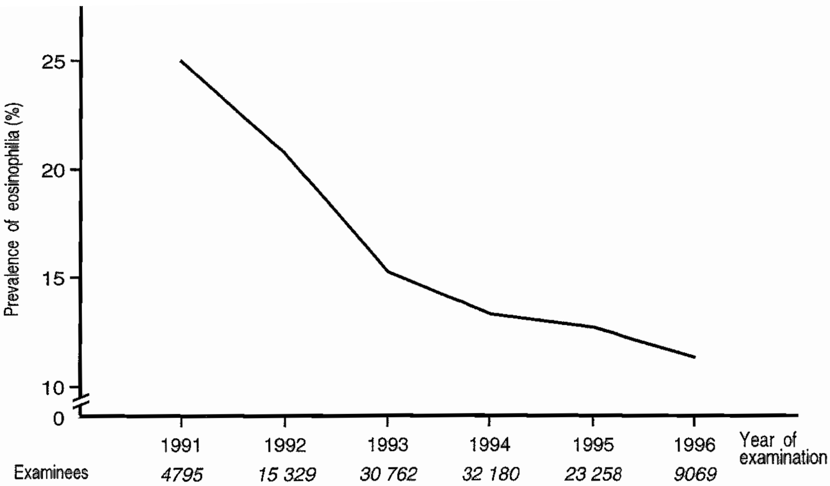

Fig. 10. Prevalence of eosinophilia by year of examination in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

with acute leukemia, and 50 children were suspected to have other kinds of anemia. Out of 609 children with leukopenia, 339 were re-examined. Of these, 258 recovered normal hematological limits while 81 sustained leukopenia. Thrombocytopenia was initially found in 109 children, 79 of whom were re-examined, 41 recovered a normal PLT count, 13 had idiopathic thrombocytopenic purpura, 24 had thrombocytopenia of unknown origin and one child was

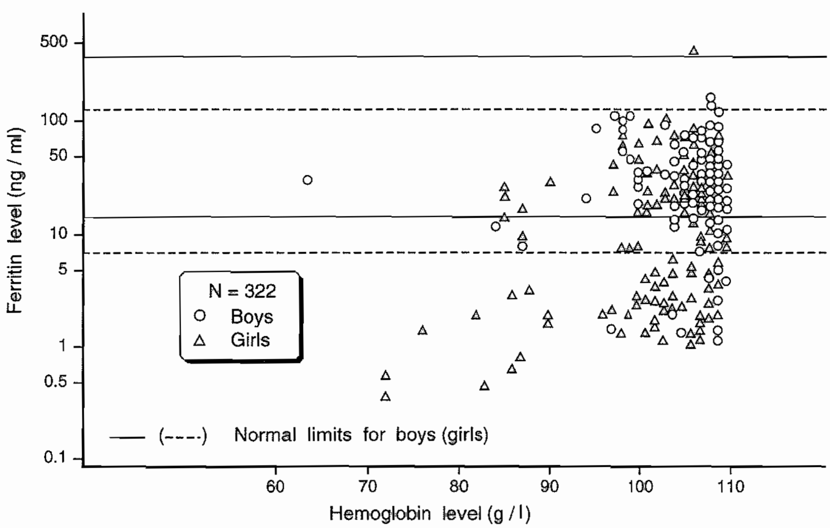

Fig. 11. Relationship between hemoglobin and ferritin levels in children with a hemoglobin level less than 100 g/dl, aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to December 1994.

Table 3. Results of re-examination of children (aged 0—10 years at the time of the accident) found to have hematological abnormalities at the screening conducted by the five centers from May 1991 to April 1996.

Hematological abnormalities	Number of children with abnormalities at screening	Number of children undergoing re-examination	Results of re-examination
Hb < 110 g/l	481	295	125 — normal 119 — iron deficiency anemia 5 — other anemia 45 — etiology unknown 1 — acute leukemia
WBC $< 3.8 \times 10^9$/l for boys $< 3.6 \times 10^9$/l for girls	609	339	258 — normal 81 — leukopenia
PLT $< 100 \times 10^9$/l	109	79	41 — normal 13 — ITP 24 — etiology unknown 1 — acute leukemia
Eo $> 0.5 \times 10^9$/l	17374	6469	4092 — normal 2377 — eosinophilia

found to have acute leukemia. The highest frequency of deviations was registered in the eosinophil count. Of the 17,374 children with initially registered eosino-

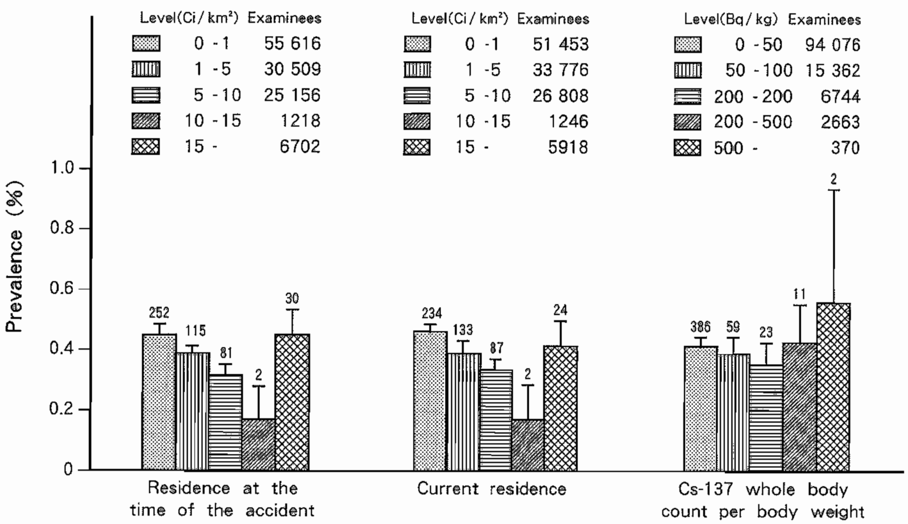

Fig. 12. Prevalence of anemia by radiation level in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The three radiation exposure markers are: 1) soil ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident; 2) soil ^{137}Cs contamination level (Ci/km^2) in the place of current residence; and 3) whole-body ^{137}Cs count per body weight (Bq/kg).

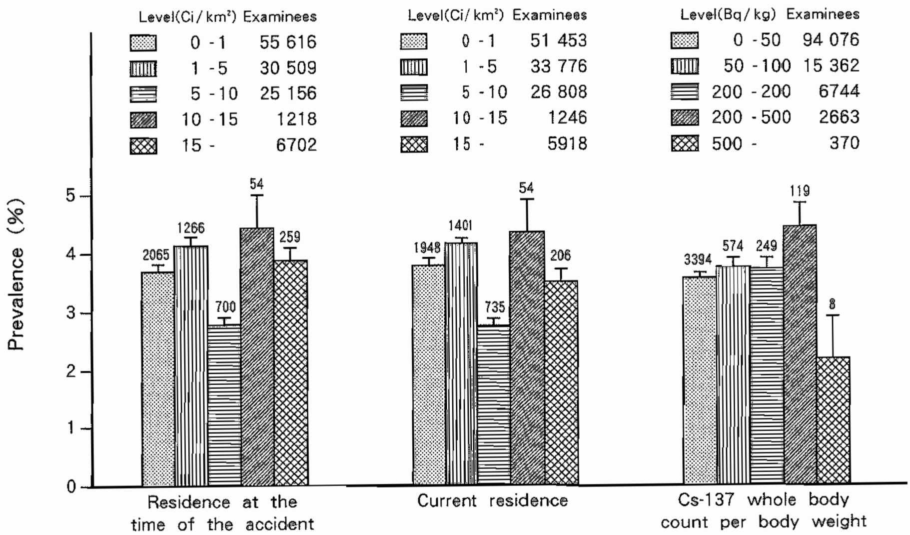

Fig. 13. Prevalence of leukocytosis by radiation level in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. (See Fig. 12 for details.)

philia, 6,469 were re-examined. 4,092 children did not show eosinophilia and 2,377 were found to have eosinophilia associated with parasitic and allergic diseases. No seasonal fluctuations were observed.

Dose-response relationship

The relationship between the prevalence of hematological abnormalities and radiation exposure was analyzed on the basis of three markers:

1) soil ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident;
2) soil ^{137}Cs contamination level (Ci/km^2) in the place of current residence; and
3) whole-body ^{137}Cs count per body weight (Bq/kg).

At the time of the accident, about 32,000 children had been living in areas contaminated with 5 Ci/km^2 or over, and about 6,700 of these had been in areas contaminated with 15 Ci/km^2 or over (Fig. 12). Most of these children may be still living in contaminated areas after the accident, as suggested in Fig. 12. The prevalence of anemia showed no significant correlation with the three radiation exposure markers. Similarly, no significant correlation with the three radiation exposure markers was observed in the prevalence of other hematological abnormalities, such as leukopenia, leukocytosis, thrombocytopenia, thrombocytosis and eosinophilia. Figure 13 shows the prevalence of leukocytosis by radiation level for the three exposure markers.

Table 4. Profiles of children diagnosed with lymphohemopoietic malignancies in the screening from May 1991 to April 1996.

Diagnosis	Sex	Age at the time of:		Place of residence at the time of accident and examination, and the contamination level there		Whole- body ^{137}Cs count per body weight (Bq/kg)
		Accident	Examination	Place of residence	Contamination level (Ci/km^2)	
ALL (pre B)	Female	1 y. and 9 mo.	10 y. and 5 mo.	Gomel City (Gomel R.)	2.01	30.0
ALL	Male	1 y. and 9 mo.	10 y. and 4 mo.	Korosten City (Zhitomir R.)	10.0	11.5
AML	Male	1 y. and 9 mo.	8 y. and 6 mo.	Klincy City (Bryansk R.)	7.33	10.0
CLL	Female	1 y. and 8 mo.	11 y. and 5 mo.	Irpenskii D. (Kiev R.)	0.78	Not detected
Hodgkin's disease	Male	6 y. and 10 mo.	16 y. and 3 mo.	Klincy City (Bryansk R.)	7.33	28.5

Hematological malignancies

Five lymphohemopoietic malignancies were found in the 5-year examination. The profiles of these five cases are shown in Table 4. Four cases were leukemia (two ALLs and one each of AML and CLL). One case was Hodgkin's disease. Three were male and two were female.

All of the four leukemia cases were under 2 years old at the time of the accident, and three of them have been living in areas contaminated with 5 Ci/km^2 or more since the accident. However, the whole-body ^{137}Cs count was not high in these cases. In most cases, the diseases appeared 9 to 10 years after the accident.

Summary

Changes in hematological parameters with age

1. Hemoglobin level: In boys, the increase noted from around the age of 10 years becomes prominent from the age of 14 years. In girls, the level tends to decrease from the age of 14 years. Abnormalities are particularly frequent among girls from the age of 14 years.
2. Ferritin level: The level tends to decrease among girls from the age of 14 years.
3. WBC count: The count tends to decrease up to the age of 8 years and then to level off among both boys and girls.
4. Thrombocyte count: The count decreases gradually with age in both boys and girls, but it is higher among girls than among boys 15 years of age or older.

Hematological abnormalities

1. Except for eosinophilia and leukopenia, there were no significant differences among the five centers.
2. Anemia was recognized in 0.2—0.5% of the children. As a result of re-examinations of 295 children, 119 were found to have iron-deficiency anemia and 50 to have other types of anemia.
3. A decrease in WBC was recognized in 0.2—1.1% of the children. At re-examination, the decrease was found to persist in 81 out of 339 children.
4. An increase in WBC was recognized in 2.8—4.9% of the children. This increase was associated consistently with infections.
5. Thrombocytopenia was recognized in 0.06—0.12% of the children. At re-examination, there were 13 cases of ITP and 24 cases of other types of thrombocytopenia out of 79 children.
6. Thrombocytosis was recognized in 1.0—1.4% of the children, but almost all the cases were accompanied by infections.
7. Eosinophilia was recognized in 12.2—18.9% of the children. The frequency was high in rural areas, but no seasonal difference was noted.

8. The frequency of these hematological abnormalities showed no differences by level of radiocontamination in the place of residence at the time of the accident or current place of residence or by ^{137}Cs dose in the body.
9. No significant increase was observed in any hematological abnormality during the 5-year examination.
10. With regard to lymphohemopoietic malignancies, one case of AML, two cases of ALL, one case of CLL and one case of Hodgkin's disease were found.

Conclusions

Although the prevalence of lymphohemopoietic malignancies was not high in children examined in this project, the profiles of the five cases of lymphohemopoietic malignancy suggest that the children exposed to the accident in infancy (under 2 years of age) and having been living in areas contaminated with 5 Ci/km^2 or more must receive hematological examinations every year to detect hematological malignancies early and to investigate the effects of the accident on the hematopoietic organs.

Chernobyl: A Decade
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Findings of the Chernobyl Sasakawa Health and Medical Cooperation Project: thyroid nodules and cancer

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Introduction

It is with great regret that we watch the completion of the Chernobyl Sasakawa project carried out in the framework of medical cooperation with the participation of specialists from Japan, Belarus, Russia, and Ukraine.

More than 160,000 children and adolescents exposed to radiation after the Chernobyl accident were examined in five diagnostic centers, and it was confirmed that benign and malignant neoplasms of the thyroid are one of the major radiological consequences of the accident.

We present the results of our clinical examinations performed at the five diagnostic centers to detect thyroid nodules and malignancies.

Results

Figure 1 shows the sex and age distribution of the children examined from May 1991 to April 1996. As shown in the histograms, sex and age distribution is similar in all centers, thus excluding the necessity to standardize indices used in further analyses.

The thyroid pathologies found and their frequency (‰) are presented in Table 1. The highest prevalence of thyroid cancer was observed in the Gomel region (38 cases, 1.92‰); the lowest in the Mogilev region (two cases, 0.08‰).

The highest number of thyroid nodules was found at Gomel Center (14.0‰ of boys and 21.1‰ of girls), where the prevalence was 2–4 times higher than that in the other diagnostic centers. The lowest prevalence of thyroid nodules was observed at Mogilev Center (0.4‰ of boys and 10‰ of girls). As shown in Fig. 2, the prevalence of thyroid nodules was higher in girls than in boys at all five diagnostic centers. The ratio of the prevalence of thyroid nodules in girls to that in boys ranged from 1.1 (Klincy) to 4.0 (Mogilev) with a mean of 1.54 for all five centers (Fig. 2). The ratio of the prevalence of thyroid cancer in girls to that in boys ranged from 1 to 2, with a mean of 1.64.

We performed a correlation analysis to evaluate the correlation between benign and malignant thyroid neoplasms (Fig. 3). The estimated correlation coefficient

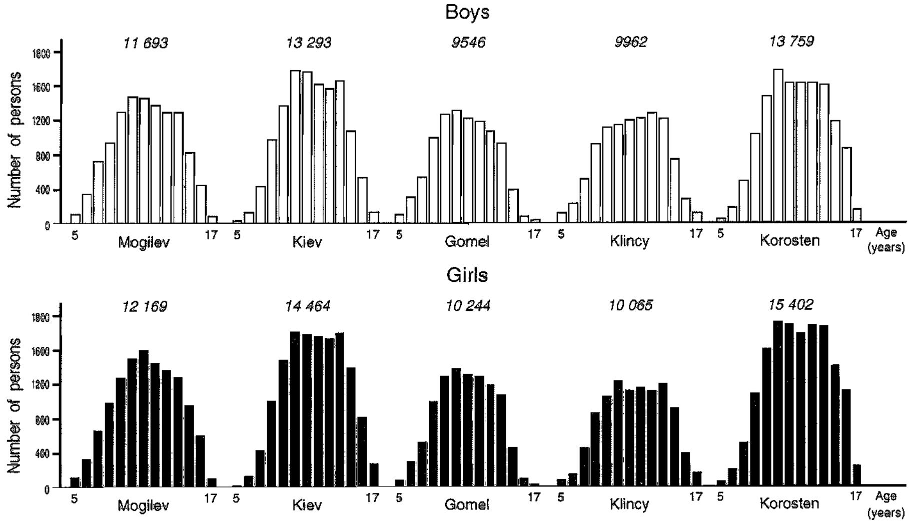

Fig. 1. Distribution of age at screening in the children examined at the five centers from May 1991 to April 1996.

was 0.99 which is statistically significant ($p < 0.05$). This indicates the close connection between these two thyroid pathologies, and it could also be the reason for the increase in their incidence. According to the regression model, there is one case of thyroid cancer for every 10 cases of thyroid nodule.

Although radiation could be an initiating factor for thyroid nodule formation, radiation-induced thyroid cancer refers to the stochastic effects. However, there must be epidemiological features for each kind of pathology. One of the epidemiological characteristics, thyroid pathology by age, is shown in Fig. 4. The prevalence of cancer is plotted along the right axis and the nodule prevalence along the left one. As shown in the diagram, the specific feature of radiation-induced thyroid cancer is the prevalence of patients who were young children at the time of the accident. Forty thyroid cancers (63.5%) were found among chil-

Table 1. Prevalence of thyroid nodules and cancer by center in children examined at the five centers from May 1991 to April 1996.

Center	Number of children examined	Thyroid nodule (‰)	Thyroid cancer (‰)
Gomel	19790	350 (17.69)	38 (1.92)
Mogilev	23868	24 (1.01)	2 (0.08)
Klincy	20027	97 (4.84)	8 (0.40)
Kiev	27759	48 (1.73)	6 (0.22)
Korosten	29161	66 (2.26)	9 (0.31)
Total	120605	585 (4.85)	63 (0.52)

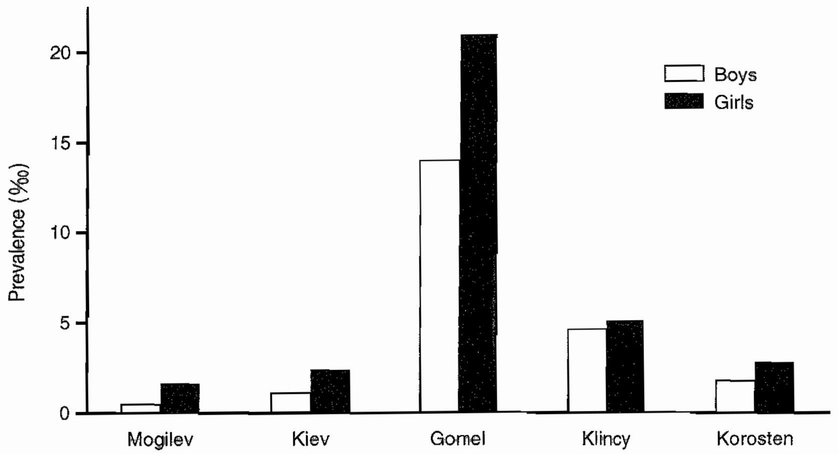

Fig. 2. The prevalence of thyroid nodules by sex and center in children examined at the five centers from May 1991 to April 1996.

dren aged 0—3 years at the time of the accident. In children aged 0—1 years at the time, the cancer/nodule ratio is 4, i.e., there is one case of cancer for four cases of thyroid nodule. In children older than 7 years at the time, this ratio is 23.5. The mean cancer/nodule ratio is 10. These data are important for the evaluation of thyroid cancer incidence in children of different age groups.

Thyroid cancer and nodules are age-dependent, a fact that explains their higher incidence in older age groups. However, radiation exposure may cause an

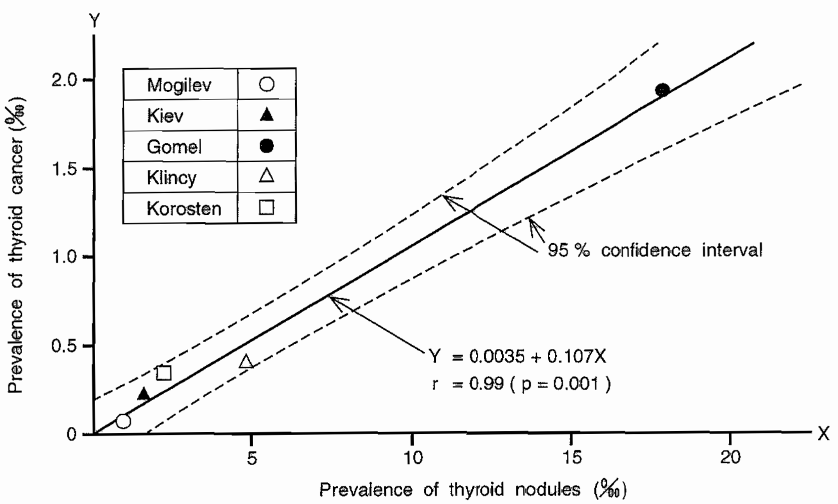

Fig. 3. Correlation between the prevalence of thyroid nodules and cancer in children examined at the five centers from May 1991 to April 1996.

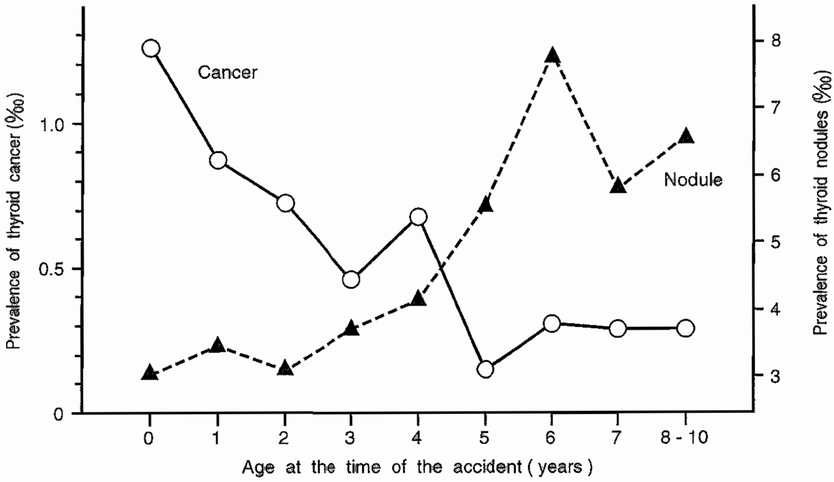

Fig. 4. Prevalence of thyroid cancer and nodules by age at the time of the accident in children examined at the five centers from May 1991 to April 1996.

increase in younger people suffering from thyroid cancer. To confirm this speculation, we attempted to determine the mean age of sick children with thyroid cancer discovered in each diagnostic center. In these series, the prevalence of thyroid nodule was considered to reflect the impact of radiation on children in each region. Correlation analysis results are shown in Fig. 5. The correlation coefficient of -0.84 indicates the close relationship between the indices and supports our speculation.

Undoubtedly, the data shown above could have been improved by the presence

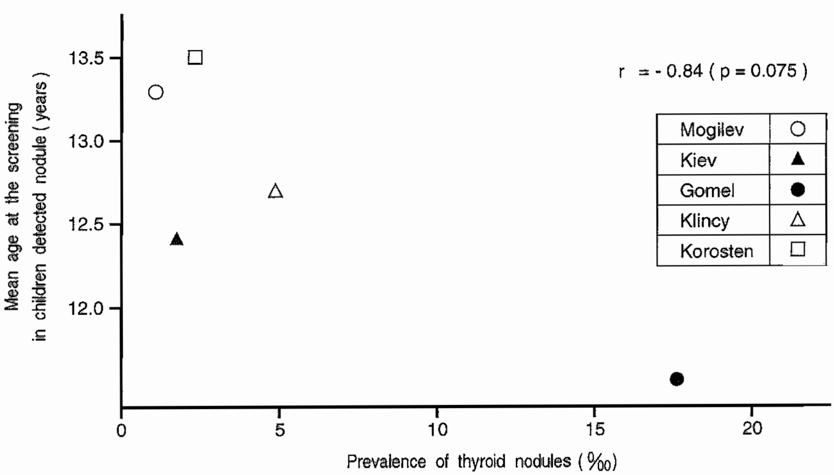

Fig. 5. Correlation between the prevalence of thyroid nodules and age at screening in children examined at the five centers from May 1991 to April 1996.

of full dosimetry data, particularly radioactive iodine incorporation by the thyroid. Unfortunately, it was not possible to carry out such an investigation in the framework of this project, which was started in 1991.

To confirm the data, we compared our results with the reconstruction doses of thyroid irradiation in children of Gomel City reported by the Institute of Biophysics of the Ministry of Health Protection of the Russian Federation. In Fig. 6, thyroid cancer by age is shown for all five diagnostic centers in comparison with the dosimetry information on about 1,600 children living in Gomel at the time of the accident.

The analogous investigation of 38 cases of thyroid cancer found only by the Gomel Diagnostic Center is presented in Figs. 7 and 8.

The above data reveal the correlation between thyroid cancer incidence and the level of thyroid irradiation and thus indicate the probable impact of radiation on thyroid cancer incidence in the contaminated areas after the Chernobyl accident.

Now we would like to discuss the dynamics of thyroid cancer revelation. The revelation dynamics were evaluated only at the Gomel Center, because a significant number of thyroid cancers was observed only in the Gomel region. The results of relative indices evaluation by year is shown in Fig. 9. The increase in thyroid cancer prevalence shown in Fig. 9 proves the great importance of early diagnosis of childhood thyroid cancer.

Aspiration biopsy and cytological diagnosis were conducted using May-Giemsa or Papanicolaou staining, which revealed papillary carcinoma by cell clusters, hyperchromic nuclei, typical intranuclear invaginations, nuclear grooves and psammoma bodies. These typical cytological findings confirmed all childhood thyroid cancers to be of the papillary type.

The histological findings of surgical specimens revealed not only papillary pro-

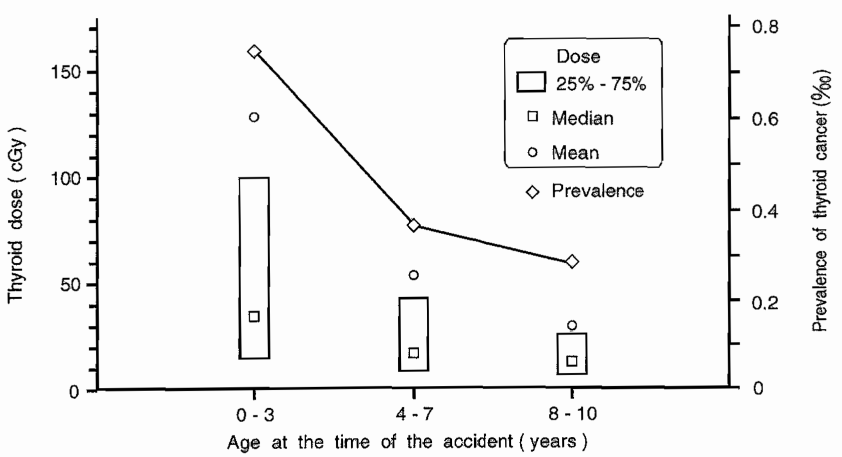

Fig. 6. Distribution of thyroid dose in children exposed in Gomel City and the prevalence of thyroid cancer in children examined at the five centers from May 1991 to April 1996.

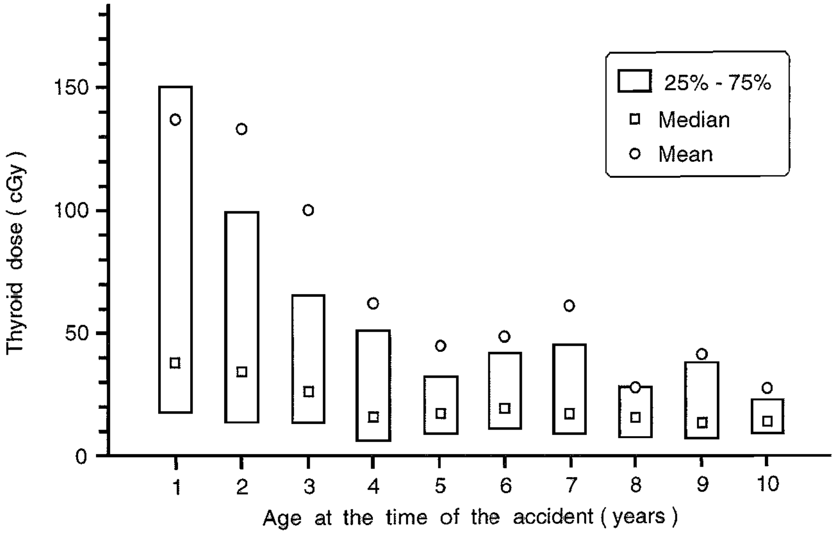

Fig. 7. Distribution of thyroid dose by age at the time of the accident in children exposed in Gomel City.

liferation but also other specific features such as stroma fibrosis. Areas of metastasis containing psammoma bodies were also found in the surrounding muscles and lymph nodes.

Fig. 8. Thyroid cancers by age at the time of the accident in children examined at Gomel Center from May 1991 to April 1996.

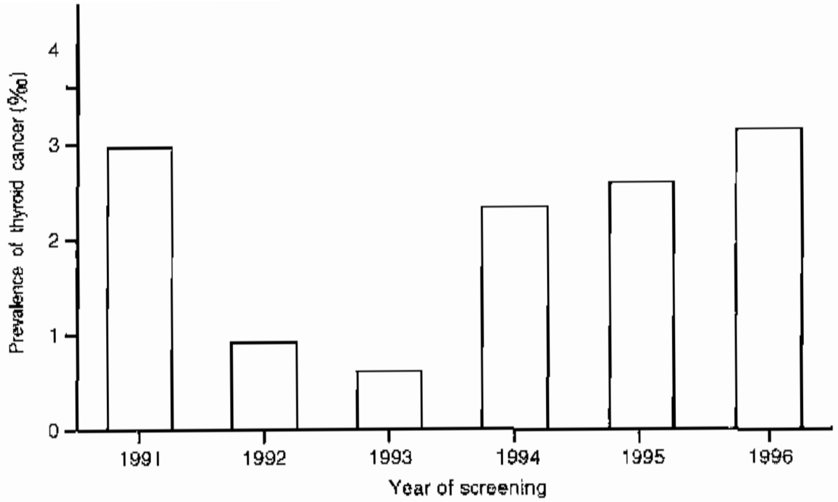

Fig. 9. Prevalence of thyroid cancer by year of screening in children examined at Gomel Center from May 1991 to April 1996.

Summary

The majority of thyroid cancers and nodules was found in Gomel, which suggests that this region is a high-risk zone for radiation-induced thyroid diseases.

A correlation between thyroid cancer incidence and thyroid irradiation level was suggested.

The risk group of radiation-induced pathology was composed of younger children who received high doses of radiation to the thyroid at the time of the accident.

Conclusion

A high prevalence of childhood thyroid cancer and nodules around Chernobyl was confirmed in the framework of the Chernobyl Sasakawa project. The importance of further long-term follow-up studies of children with thyroid nodules and screening of the younger population should be taken into consideration to ensure the early diagnosis of thyroid cancer.

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Relationship between thyroid abnormality and absorbed dose for children living in the Chernobyl area

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Introduction

The Chernobyl nuclear power plant accident occurred at the end of April 1986. A huge amount of fission products was released and caused global contamination. In particular, people living relatively close to the Chernobyl nuclear power plant are thought to have been exposed to radiation. To examine children in this area, the Chernobyl Sasakawa Health and Medical Cooperation (CSHMC) project started in April 1991 as a 5-year project. With the help of the Ministry of Health in the former Soviet Union, the CSHMC project determined the area of the examination. These areas were in the five oblasts (administrative area of the former Soviet Union) and in each oblast the medical centers of the CSHMC project were located. Now these places are separated into three countries at Mogilev and Gomel, Belarus, Kiev and Korosten, Ukraine and Klincy, Russia. Examined residents were children aged between 0 and 10 years old at the time of the accident. There were three types of examination: thyroid gland examination, hematological examination and whole-body ^{137}Cs measurements [1–9]. The major part of the project was finished in 1996, and the total number of children examined amounts to more than 150,000.

The thyroid and hematological results of the CSHMC examinations were compared with ^{137}Cs whole-body results, but no correlations were noted among the data obtained.

In this study, thyroid reconstructed doses obtained through efforts by the former Soviet Union [10,11], were applied for the CSHMC results, especially the thyroid data. The relationships are discussed in this paper.

Materials and Methods

We used the data from clinical examinations of the thyroid gland of children examined in the framework of the international "Chernobyl-Sasakawa" program [8,9] from 1992 to 1994. The data of reconstructed doses for the thyroid exposed to radioactive iodine were obtained from the Institute of Biophysics of the Health

Ministry of the Russian Federation as a result of the measurement of γ-rays emitted from thyroid glands in the first days after the accident.

As a main group we chose the children who were aged between 0 and 7 years old at the time of the accident and who lived in the evacuated area (Bragin, Narovlyany, and Hoiniki districts) and also residents of the settlements in Rechitsa district, where the measurements of the thyroid gland were performed. As we were only able to obtain measurements of the personal doses to the thyroid gland of about 20% of the children in the main group, for this analysis we used instead the geometric mean of doses to the thyroid gland for each settlement. The number of children in each of the corresponding age groups, for whom thyroid measurements were performed in May 1986, was not less than five. Because almost all the people living in the Gomel region were exposed to radioactive iodine, it was impossible to form a control group of the same age. For this reason we used a group of children in two northern rayons of the Gomel region (Rogachev and Zlobin districts) for comparison. In this area most of the migrants who were chosen in the main group are still living.

As criteria for the estimation of prevalence of thyroid abnormality in both groups, we used the discovery rate of nodular forms of thyroid abnormality, found by ultrasound examination and discovery rate of positive antimicrosome antibody (AMC) in the serum in laboratory tests by the IFA method.

Results and Discussion

The number of children in the main group and the group for comparison, and the number of discovered cases of nodular abnormality and the positive AMC cases are shown in Table 1. The prevalence of thyroid abnormality in the main group is higher than that in the group for comparison among both boys and girls. A statistically significant difference was found in frequency of positive AMC between the group for comparison and the main group ($p = 0.03$) and between girls in the group for comparison and girls in the main group ($p = 0.04$).

For further analysis, the main group was divided into four subgroups according

Table 1. Prevalence of thyroid gland abnormality in the main group and in the group for comparison.

	Total			Girls			Boys		
	Number of subjects	Nodular abnormality	Positive AMC	Number of subjects	Nodular abnormality	Positive AMC	Number of subjects	Nodular abnormality	Positive AMC
Main group	1530	33 (2.2%)	28[a] (1.8%)	754	20 (2.7%)	21[a] (2.8%)	776	13 (1.7%)	7 (0.9%)
Comparison group	509	5 (1.0%)	2 (0.4%)	288	4 (1.4%)	2 (0.7%)	221	1 (0.5%)	0 (0%)

[a]The prevalence was significantly higher ($p < 0.05$) in the main group than in the comparison group.

Table 2. Prevalence of thyroid gland abnormality in the four subgroups of the main group.

Sub-group	Dose (cGy)	Total			Girls			Boys		
		No. of subjects	Nodular abnormality	Positive AMC	No. of subjects	Nodular abnormality	Positive AMC	No. of subjects	Nodular abnormality	Positive AMC
I	0–50	713	9 (1.3%)	13 (1.8%)	363	6 (1.7%)	10 (2.8%)	350	3 (0.9%)	3 (0.9%)
II	50–100	255	6 (2.4%)	3 (1.2%)	122	3 (2.5%)	1 (0.8%)	133	3 (2.3%)	2 (1.5%)
III	100–200	273	7 (2.6%)	6 (2.2%)	126	3 (2.4%)	4 (3.2%)	147	4 (2.7%)	2 (1.4%)
IV	200–	289	11 (3.8%)	6 (2.1%)	143	8 (5.6%)	6 (4.2%)	146	3 (2.1%)	0 (0%)

to the estimated thyroid doses: 1) 0–50 cGy, 2) 50–100 cGy, 3) 100–200 cGy, and 4) more than 200 cGy. The results are shown in Table 2 and in Figs. 1 and 2. It can be seen from these data that there is a clear dependance of the prevalence of nodular lesions and positive AMC titers on the mean thyroid gland doses for both boys and girls. Statistical analysis of the data showed significant differences between discovery rate of nodules in girls from the group for comparison and girls with a thyroid dose higher than 50 cGy ($p = 0.02$) and also between girls of subgroup 1 and subgroup 4 ($p = 0.015$).

It is interesting that prevalence of nodules in children of subgroup 1 practically coincides with the same parameter in the group for comparison. Although unclear, it is possible that the threshold for this type of abnormality is in the dose interval 50–100 cGy.

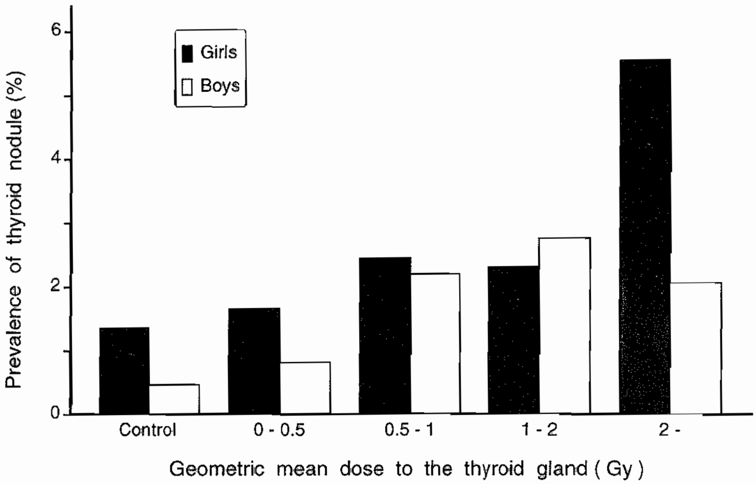

Fig. 1. Relationship between the prevalence of nodular abnormality and thyroid gland dose.

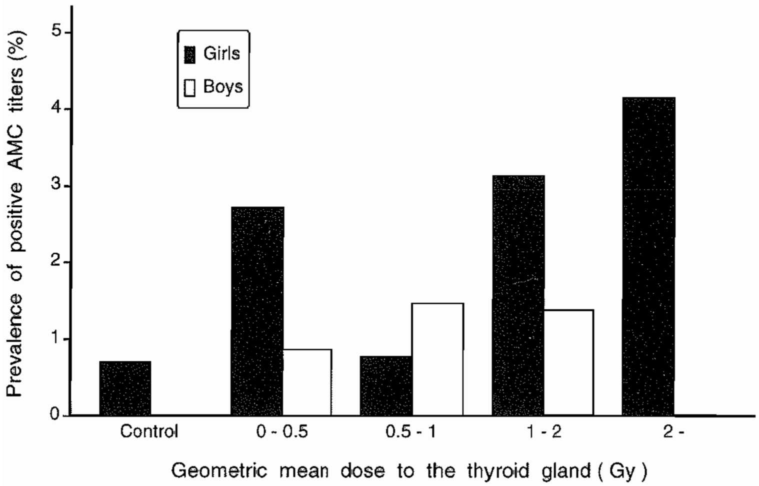

Fig. 2. Relationship between the prevalence of positive AMC titers and thyroid gland dose.

The analysis of positive AMC titers rate indicated significant differences between girls of subgroups 3 and 4 and those in the group for comparison. In boys and girls in the main group this parameter is higher than in the group for comparison in all dose groups. It is possible that the threshold for this kind of abnormality lies at a level less than the 50 cGy dose group.

We made a similar comparison with the ^{137}Cs contamination levels applying the contamination data for each child. However, we did not find any statistically significant correlation between contamination level and prevalence of thyroid abnormality.

We found that there is a marked dependence between thyroid gland irradiation dose and discovery rate of nodules and positive AMC titers.

Our method using the geometric average for the residents who do not have estimated personal doses will help to estimate the risk of thyroid abnormality. It is necessary to make more research efforts for thyroid dose reconstruction to obtain more accurate thyroid doses and also to conduct more examinations on children in the Gomel Region, since there will be many more cases of thyroid abnormality and corresponding cancer.

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Findings of the Chernobyl Sasakawa Health and Medical Cooperation Project: abnormal thyroid echogenity and autoimmune thyroid diseases around Chernobyl

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Introduction

The Korosten Inter-Area Medical Diagnostic Center has developed with the Chernobyl Sasakawa Project and is now a key center for health screening of children who reside in the northern territory of the Zhitomir region. As we have found a high prevalence of chronic thyroiditis around Zhitomir, we would like to summarize the results of thyroid abnormalities, especially abnormal ultrasonographic findings and antibodies against the thyroid gland in the circulation. The data of serum hormone measurements are also presented. We omit the description of the subjects and methods because they are presented elsewhere in this volume (pp. 23–38).

Results

Ultrasonographic thyroid abnormalities

The typical ultrasonographic findings of chronic thyroiditis can be summarized as a nodular, enlarged thyroid gland, irregular surface, low echogenity, and fine cystic degeneration at the deeper areas, as shown in Fig. 1.

Figure 2 shows the prevalence of ultrasonographic thyroid abnormalities by year of examination among children examined at the five centers in the last 5 years. The prevalence of abnormal echogenity showed an increase with each year, while the prevalence of cystic and nodular lesions remained unchanged. For these reasons, we first focused on the presentation of abnormal thyroid echogenity.

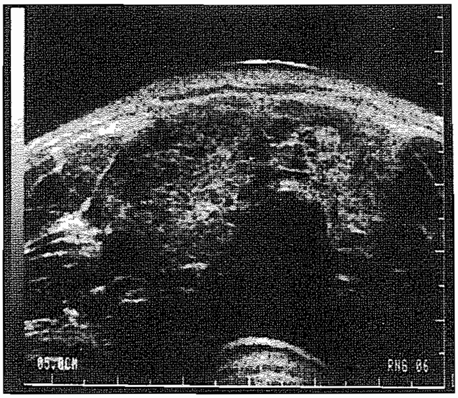

Fig. 1. A typical ultrasonographic image of chronic thyroiditis.

Among the 119,178 children analyzed at the five centers over the last 5 years, 2,597 showed abnormal echogenity. As shown in Fig. 3, the highest number of cases of abnormal thyroid echogenity was observed in the Gomel region (936 cases, or approximately 4.9%). The lowest number of cases was observed in Zhitomir.

Antithyroid antibody

Figure 4 depicts the prevalence of positive antimicrosomal antibody (AMC) in children examined at the five centers in the last 5 years. The mean prevalence of AMC at the five centers was 2.5% and the highest number of positive AMC was

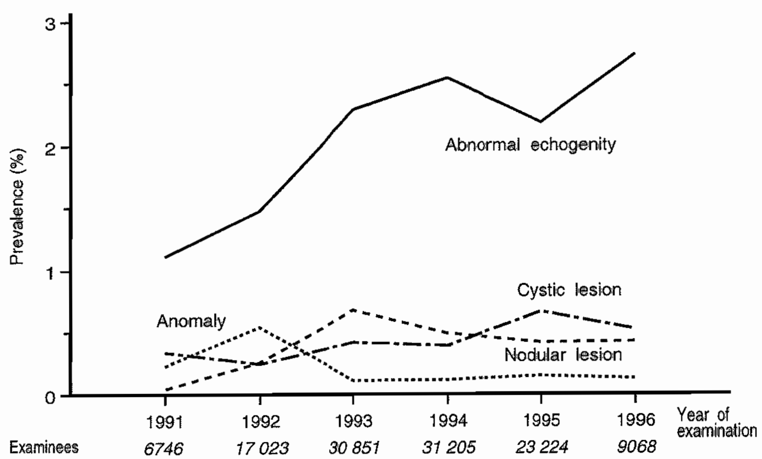

Fig. 2. The prevalence of ultrasonographic thyroid abnormalities by year of examination in children aged 0–10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

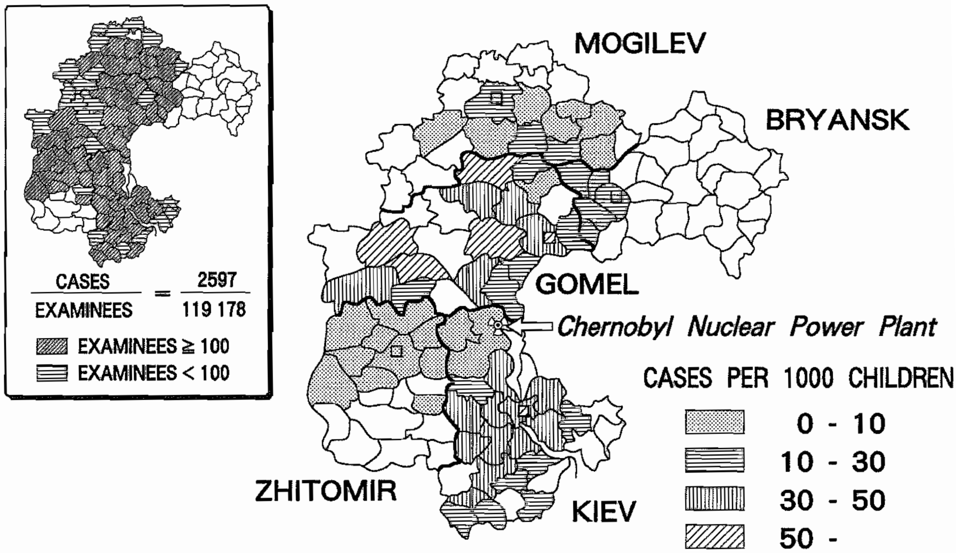

Fig. 3. The prevalence of abnormal echogenity by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The prevalence was calculated for the districts with 100 or more children examined.

observed in Korosten, 3.2%. The prevalence of positive antithyroglobulin antibody (ATG) around Chernobyl is shown in Fig. 5. Positive titers were found in

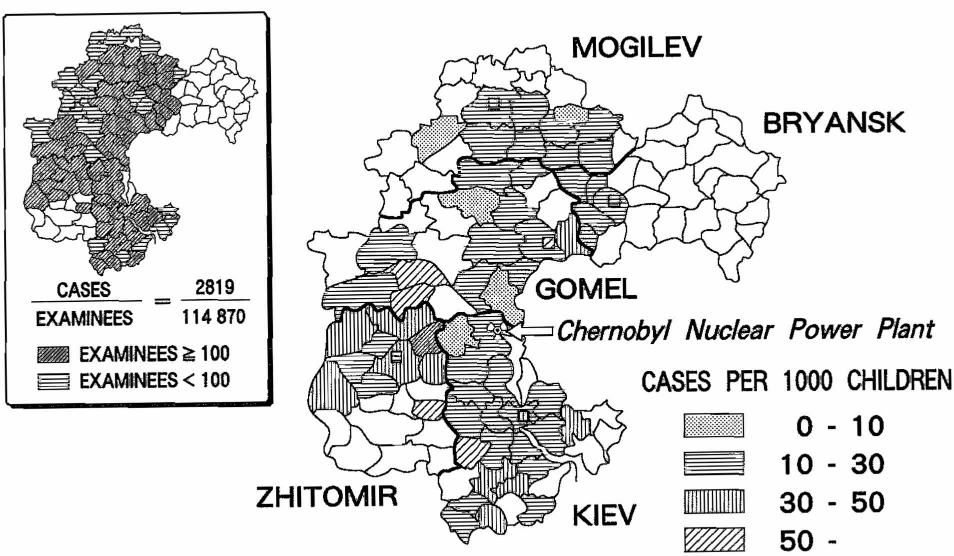

Fig. 4. The prevalence of positive antimicrosomal antibody (AMC) by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The prevalence was calculated for the districts with 100 or more children examined.

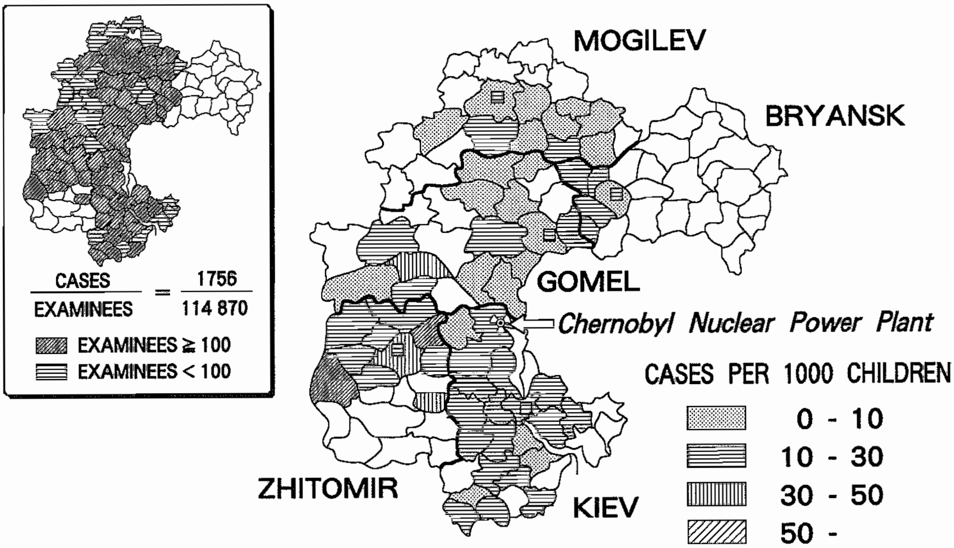

Fig. 5. The prevalence of positive antithyroglobulin antibody (ATG) by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The prevalence was calculated for the districts with 100 or more children examined.

1,756 out of 114,870 children. The mean prevalence was 1.5% and the highest number was observed in Korosten, 2.4%. No significant temporal change was observed in the prevalence of positive AMC and ATG titers in the last 5 years (Fig. 6).

The prevalence of positive AMC and ATG titers by sex and age is shown in

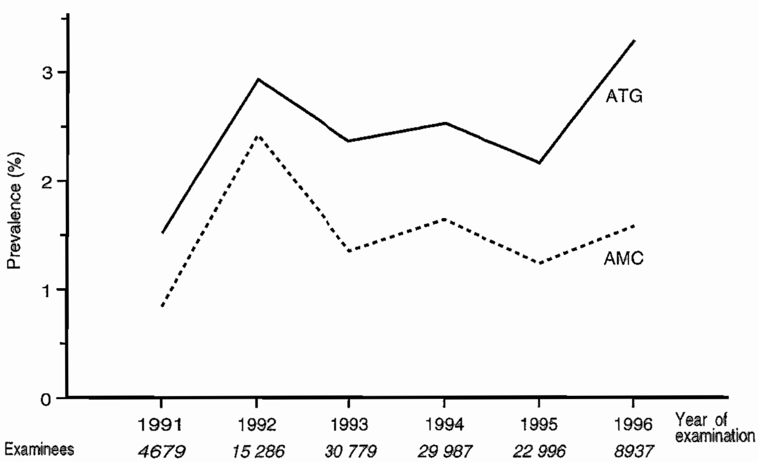

Fig. 6. The prevalence of positive AMC and ATG titers by year of examination in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

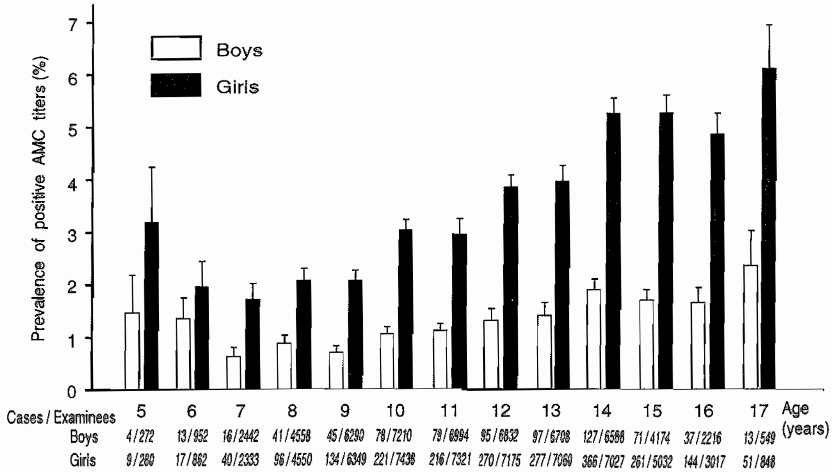

Fig. 7. The prevalence of positive AMC titers by sex and age at the time of examination in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Figs. 7 and 8, respectively. The ages represent the age at the time of examination. The prevalence of positive AMC and ATG was higher in girls than in boys through all ages and a tendency to increase with age was observed among girls.

Fine-needle aspiration cytology findings of suspected chronic thyroiditis demonstrated the infiltration of many lymphocytes, epithelium hyperplasia and, in some cases, Askanazy cells. In Korosten as well as in Gomel, almost all cases

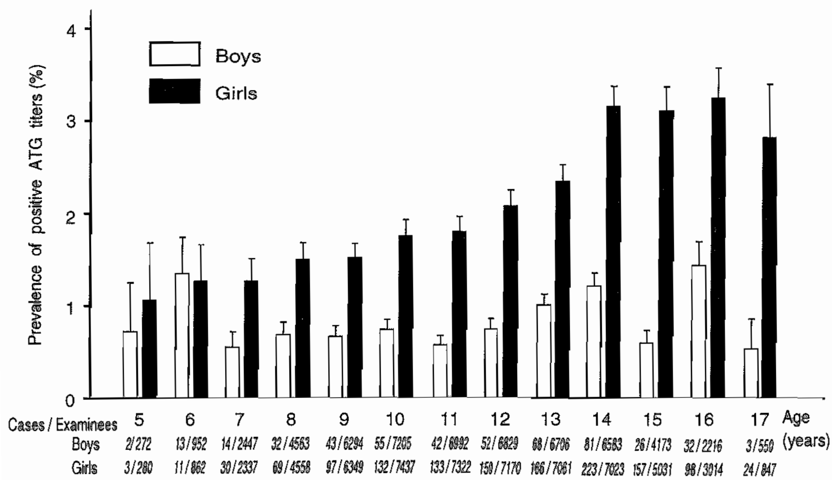

Fig. 8. The prevalence of positive ATG titers by sex and age at the time of examination in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

of positive autoantibodies against thyroid glands with abnormal echogenity were cytologically confirmed to be Hashimoto's thyroiditis.

Serum thyroid hormone

All the children were subjected to the measurement of serum thyroid hormone, i.e., free T_4 and TSH using the immunometric technique based on enhanced luminescence kits. Figure 9 shows the prevalence of hyperthyroidism, not clinically manifested but chemical hyperthyroidism based on the definition of increased free T_4 as well as decreased TSH levels. 166 out of 117,722 children (0.14%) demonstrated chemical hyperthyroidism. The highest number of cases of children with hyperthyroidism was observed in the Mogilev region, but this is suspected to be attributable to inappropriate intake of thyroid hormone. Aside from this specific district, the overall prevalence of hyperthyroidism was almost the same in the five regions (0.10%). In contrast, the prevalence of subclinical hypothyroidism was relatively high in Gomel (Fig. 10). The mean prevalence of hypothyroidism was 153 out of 117,722 (0.13%) but half of the cases of subclinical hypothyroidism were probably due to chronic thyroiditis discovered in Gomel.

Dose-response relationship

The relationship between the prevalence of positive AMC titers and radiation

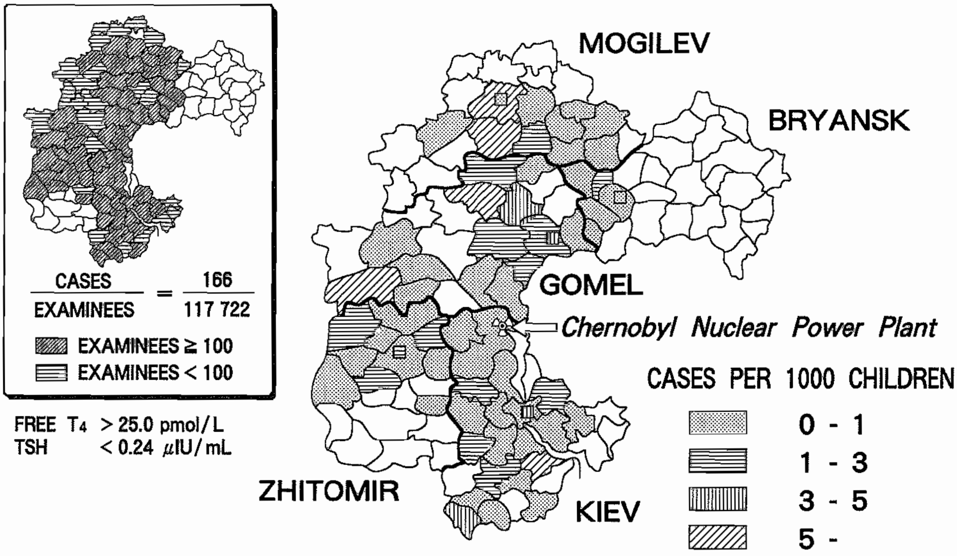

Fig. 9. The prevalence of hyperthyroidism (diagnosed when free $T_4 > 25.0$ pmol/l and TSH < 0.24 μIU/ml) by district in children aged 0–10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The prevalence was calculated for the districts with 100 or more children examined.

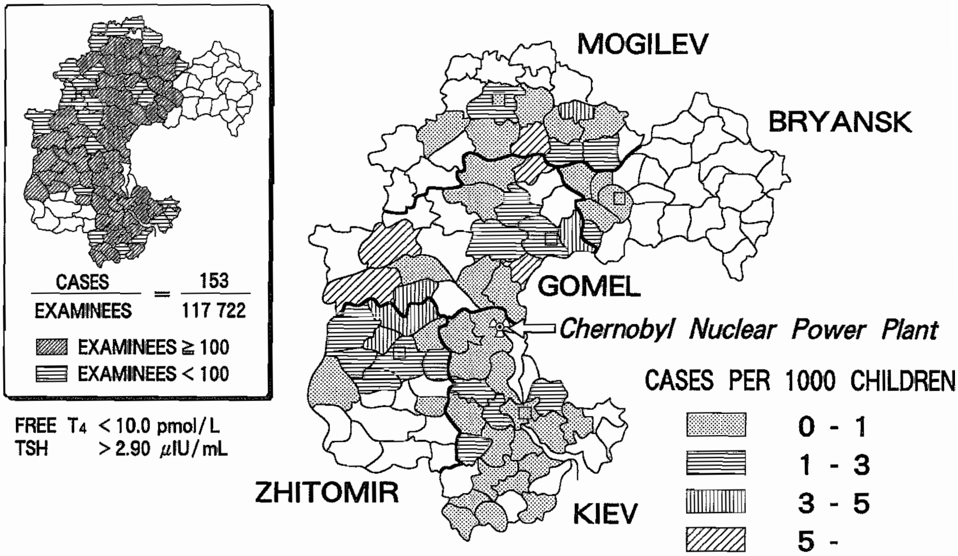

Fig. 10. The prevalence of hypothyroidism (diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml) by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The prevalence was calculated for the districts with 100 or more children examined.

exposure was analyzed on the basis of three markers: 1) whole-body ^{137}Cs count per body weight (Bq/kg); 2) soil ^{137}Cs contamination level (Ci/km^2) in the place of current residence; and 3) soil ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident. No significant relationship was observed

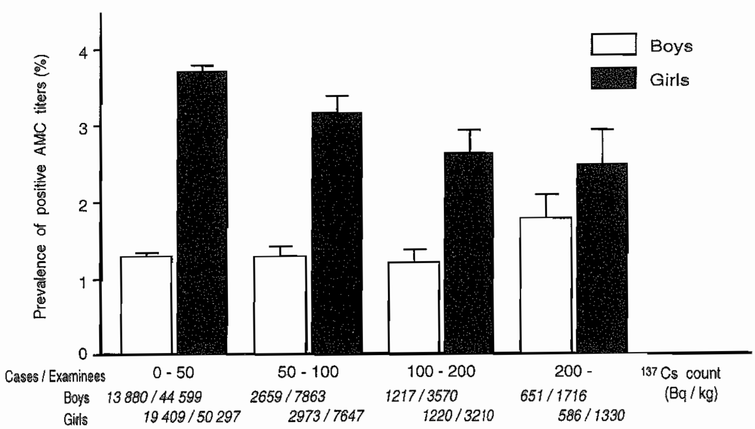

Fig. 11. The prevalence of positive AMC titers by whole-body ^{137}Cs count per body weight (Bq/kg) in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

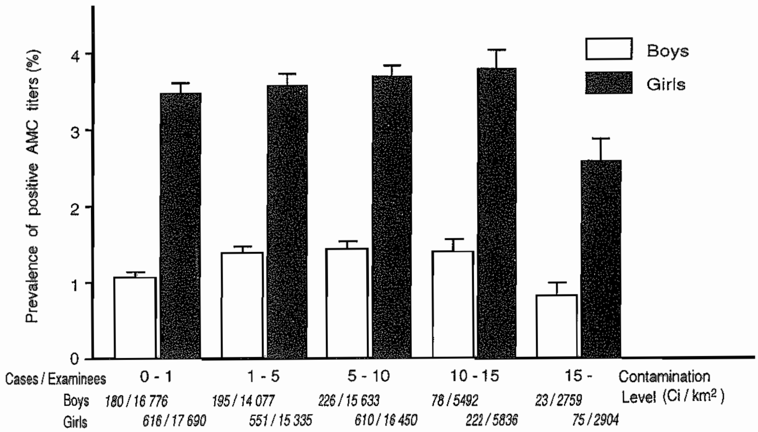

Fig. 12. The prevalence of positive AMC titers by ^{137}Cs contamination level (Ci/km^2) in the place of current residence among children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

between the prevalence of positive AMC titers and the three radiation exposure markers (Figs. 11—13).

Similar analyses were conducted for the prevalence of positive ATG titers and the prevalence of thyroid dysfunction. No significant relationship with the three radiation exposure markers was observed for the prevalence of positive ATG titers (Figs. 14—16), hyperthyroidism (data not shown) or hypothyroidism (Figs. 17—19).

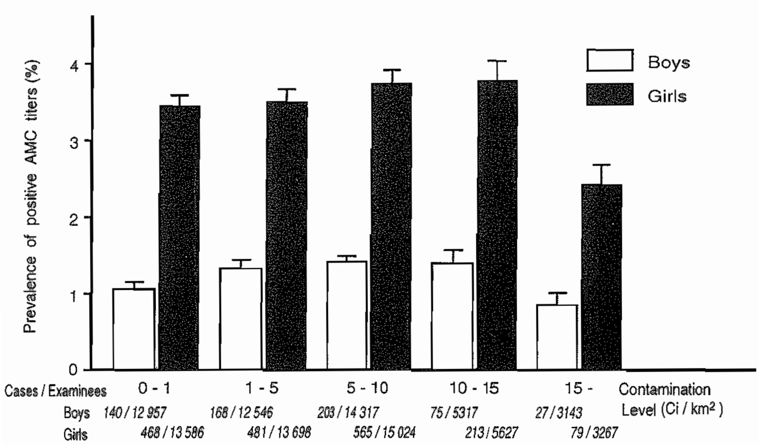

Fig. 13. The prevalence of positive AMC titers by ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident among children aged 0—10 years then and examined at the five centers from May 1991 to April 1996.

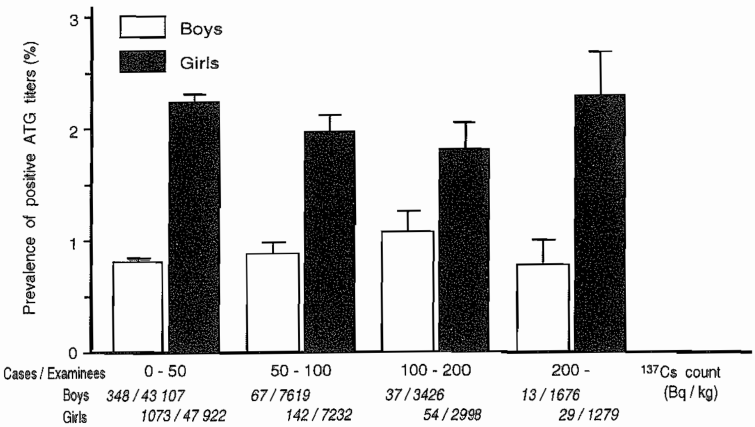

Fig. 14. The prevalence of positive ATG titers by whole-body ^{137}Cs count per body weight (Bq/kg) in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Summary

1. The prevalence of abnormal thyroid echogenity was approximately 2.2% around Chernobyl and was highest in Gomel (4.9%).
2. Fine-needle aspiration cytology confirmed the diagnosis of chronic thyroiditis in children with abnormal thyroid echogenity and with positive titers of AMC and/or ATG.
3. The prevalence of positive AMC and ATG titers was 2.1 and 1.5%, respectively. The highest prevalence was observed in Korosten, AMC 3.2% and ATG 2.4%.

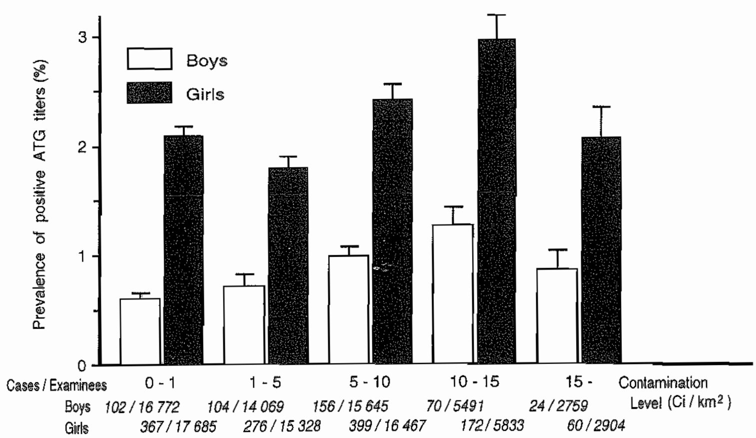

Fig. 15. The prevalence of positive ATG titers by ^{137}Cs contamination level (Ci/km^2) in the place of current residence among children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

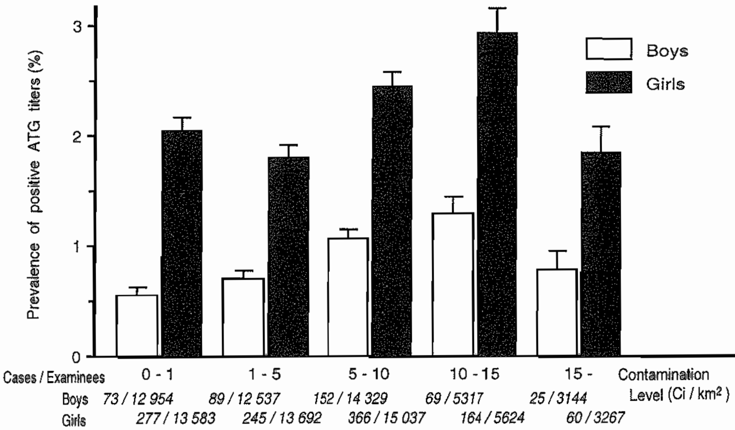

Fig. 16. The prevalence of positive ATG titers by ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident among children aged 0—10 years then and examined at the five centers from May 1991 to April 1996.

4. The prevalence of positive AMC and ATG titers in children increased with age and was higher among girls than boys in all age groups.
5. The prevalence of positive AMC and ATG titers did not show any significant correlation with ^{137}Cs activity in the body or with soil ^{137}Cs contamination level in the place of current residence or in the place of residence at the time of the accident.
6. The prevalence of hyperthyroidism was 0.14% and no correlation with ^{137}Cs levels was observed.
7. The prevalence of hypothyroidism was 0.13% and no correlation with ^{137}Cs levels was observed.

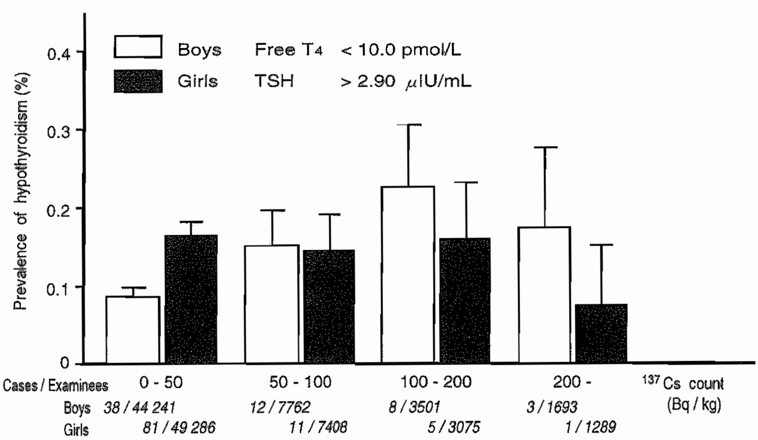

Fig. 17. The prevalence of hypothyroidism by whole-body ^{137}Cs count per body weight (Bq/kg) in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

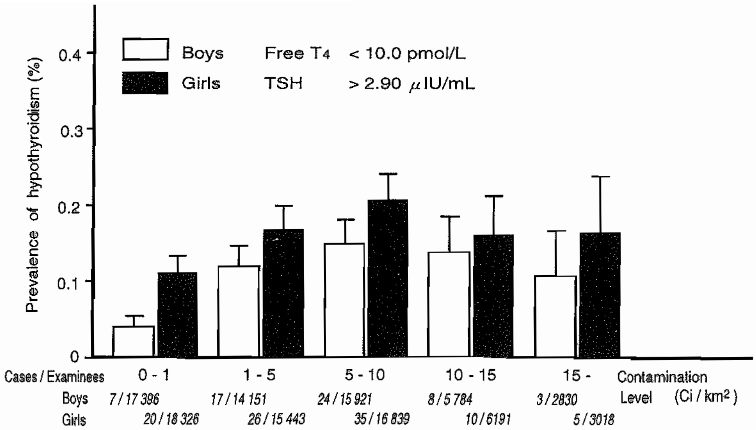

Fig. 18. The prevalence of hypothyroidism by ^{137}Cs contamination level (Ci/km^2) in the place of current residence among children aged 0–10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Conclusions

We have clarified the prevalence of abnormal thyroid echogenity and autoimmune thyroid diseases with thyroid dysfunction around Chernobyl. To date, no relationship between these abnormalities and ^{137}Cs contamination levels has been established. A further follow-up and analysis are needed, especially in combination with the ^{131}I thyroid dose, to clarify the relationship between radiation exposure and thyroid diseases.

The ultrasonographic examination of the thyroid and the measurement of thy-

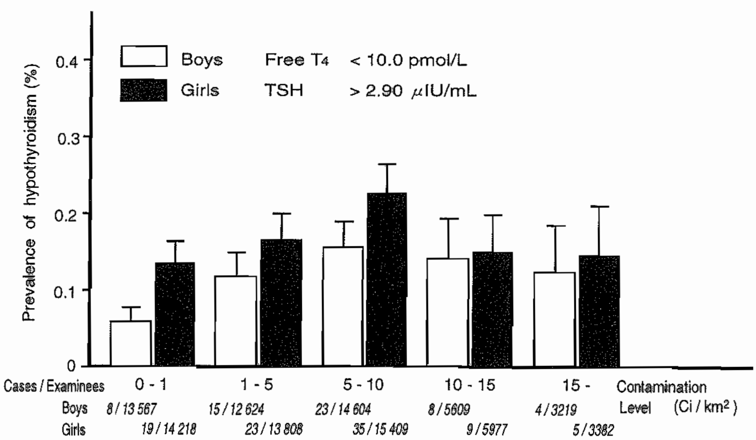

Fig. 19. The prevalence of hypothyroidism by ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident among children aged 0–10 years then and examined at the five centers from May 1991 to April 1996.

roid autoantibody titers in the blood have been a great benefit to the local residents. It should be noted in particular that the accuracy of diagnosis and treatment of thyroid diseases have improved significantly at each of the five centers.

Chernobyl: A Decade
S. Yamashita and Y. Shibata, editors.

Findings of the Chernobyl Sasakawa Health and Medical Cooperation Project: goiter and iodine around Chernobyl

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Introduction

Since May 1991, we have examined more than 150,000 children residing in five regions around Chernobyl and analyzed the data compiled from five centers. We omit the description of the subjects and methods which are presented elsewhere in this volume (pp. 23—38). We present the results of thyroid ultrasonographic findings, especially goiter, and urinary iodine contents to evaluate the high incidence of goiter around the Chernobyl areas. The ^{137}Cs data are also compared to elucidate the correlation with the prevalence of goiter.

Results

Prevalence of goiter

A clinical diagnosis of thyroid disease was established on the basis of ultrasonographic findings such as nodularity and goiter. Table 1 summarizes the prevalence of various thyroid diseases around Chernobyl, including nodules and autoimmune thyroid disease. A high prevalence of goiter in Kiev is characteristic and in general the presence of endemic goiter is strongly suspected around these areas.

Among 119,178 children examined at the five centers from May 1991 to April 1996, 42,470 showed increased thyroid volume (Fig. 1). The highest prevalence of goiter was observed in most districts of the Kiev region. The average goiter prevalence was 54% in Kiev, 41% in Bryansk, 38% in Zhitomir, 18% in Gomel and 22% in Mogilev (Table 1). The prevalence of goiter varied from district to dis-

Table 1. Ultrasonographic thyroid abnormalities by region and sex in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

Diagnosis	Region														
	Gomel (19273)			Mogilev (23531)			Bryansk (19918)			Kiev (27498)			Zhitomir (28958)		
	B	G	‰	B	G	‰	B	G	‰	B	G	‰	B	G	‰
Goiter	1355	2053	177	2231	2931	219	3666	4480	409	6634	8194	539	4473	6453	377
Abnormal echogenity	332	604	48.6	91	188	11.9	172	251	21.2	246	588	30.3	38	87	4.3
Cystic lesion	59	63	6.3	19	25	1.9	56	51	5.4	18	40	2.1	34	137	5.9
Nodular lesion	130	212	17.7	5	19	1.02	46	53	5.0	13	33	1.7	23	43	2.3
Cancer	12	25	1.92	1	1	0.08	3	5	0.40	2	4	0.22	4	5	0.31
Anomaly	67	73	7.3	16	19	1.5	7	8	0.8	4	7	0.4	17	19	1.2

Figures in parentheses show the number of children (boys and girls) examined. B = boys, G = girls, ‰ = permillage of children (boys and girls) with the respective abnormalities.

trict and no specific tendency was observed either within the same region or beyond the national borders.

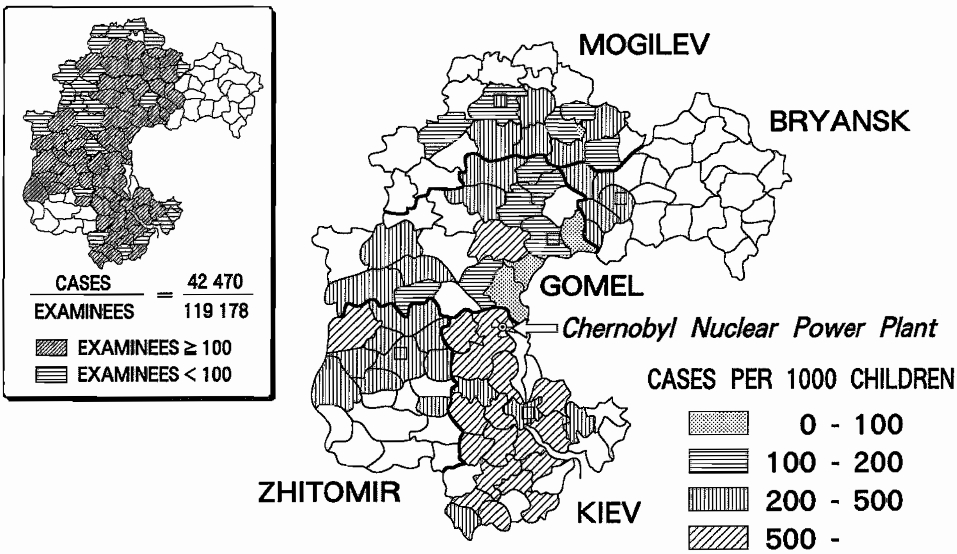

Fig. 1. Prevalence of goiter by district in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The districts with less than 100 examined children were excluded from the calculation of prevalence.

It is reported [1] that the thyroid volume of boys and girls was higher in the Bryansk and Kiev regions than in the other three regions through almost all age groups, and that a tendency for an increase in thyroid volume with age was shown among boys and girls, although in girls the increase seemed to cease between 14 and 16 years of age.

The prevalence of goiter by sex and age is shown in Fig. 2. At 5 years of age, goiter was observed in about 10% of boys and girls, but the prevalence of goiter increased with age reaching 50% at 17 years old. Although further analyses are needed, this is the first evidence that the prevalence of childhood goiter increased with age around Chernobyl.

Dose-response relationship

The relationship between the prevalence of goiter and radiation exposure was analyzed on the basis of three markers: 1) the whole-body ^{137}Cs count per body weight (Bq/kg); 2) the soil ^{137}Cs contamination level (Ci/km^2) in the place of current residence; and 3) the soil ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident. Except for the whole-body ^{137}Cs count per body weight, which suggested an increase with the prevalence of goiter (Fig. 3), no correlation with the prevalence of goiter was observed (Figs. 4 and 5).

Urinary iodine concentration

Since no significant correlation was observed between the prevalence of goiter and radiation exposure by ^{137}Cs, we investigated the urinary iodine concentration

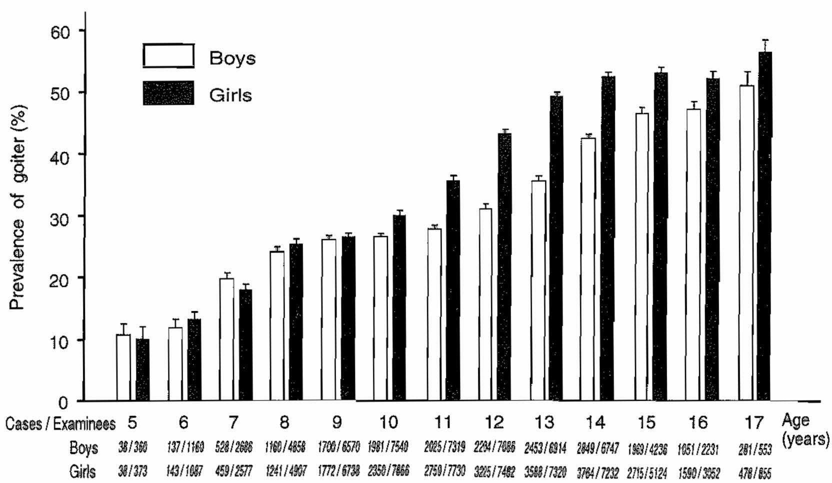

Fig. 2. Prevalence of goiter by sex and age in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The whiskers denote the standard errors.

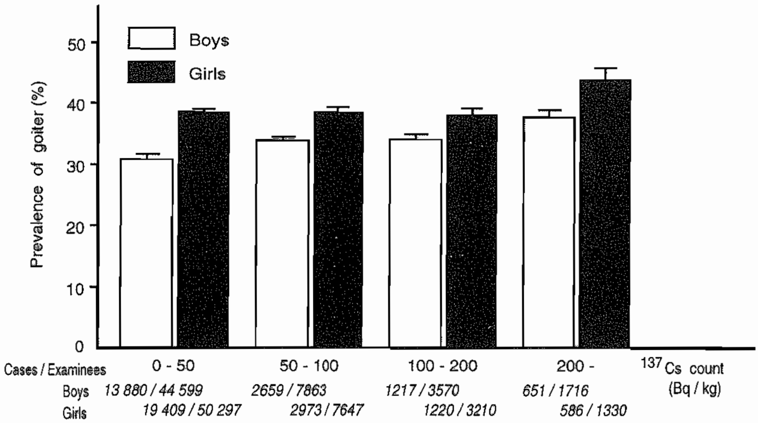

Fig. 3. Prevalence of goiter by whole-body ^{137}Cs count per body weight (Bq/kg) in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The whiskers denote the standard errors.

around Chernobyl using an AutoAnalyzer II system (Bran+Luebbe, Nordersted, Germany). This system is capable of detecting 0.1 μg/dl of urinary iodine in a urine sample of 500 μl [2].

A significant negative correlation is reported (Spearman's rank correlation coefficient = -0.35, $p<0.05$) in a cohort of about 5,700 children who were classified into 40 groups by place of residence [1]. It is also reported that the median level of urinary contents was less than 10 μg/dl in the Bryansk, Kiev and Zhitomir regions while it was as high as about 17 μg/dl in the Gomel and Mogilev regions [1].

We also investigated the correlation between the urinary iodine concentration

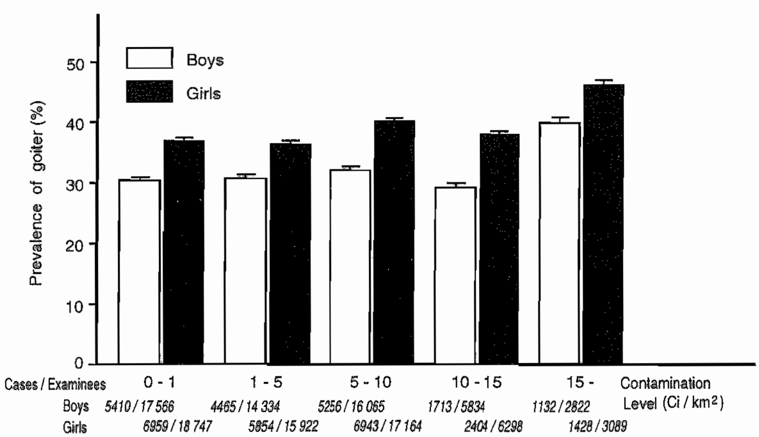

Fig. 4. Prevalence of goiter by ^{137}Cs contamination level (Ci/km^2) in the place of current residence among children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996. The whiskers denote the standard errors.

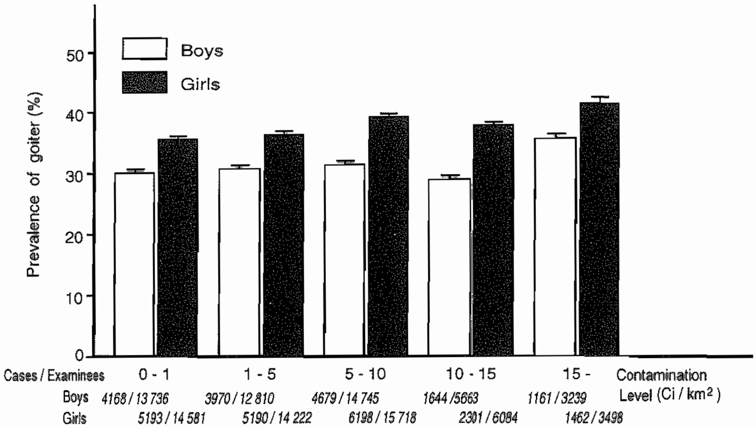

Fig. 5. Prevalence of goiter by ^{137}Cs contamination level (Ci/km^2) in the place of residence at the time of the accident among children aged 0—10 years then and examined at the five centers from May 1991 to April 1996. The whiskers denote the standard errors.

and the serum-free T_4 and TSH levels, and thyroid volume in a cohort of about 5,600 children whose urinary iodine levels were measured at the Mogilev and Kiev centers. A statistically significant positive correlation was observed between the urinary iodine concentration and the serum free T_4 level, but the estimated correlation coefficient was small (Fig. 6). On the other hand, no significant correlation was observed between the urinary iodine concentration and serum TSH level (Fig. 7). The significant negative correlation between urinary iodine concen-

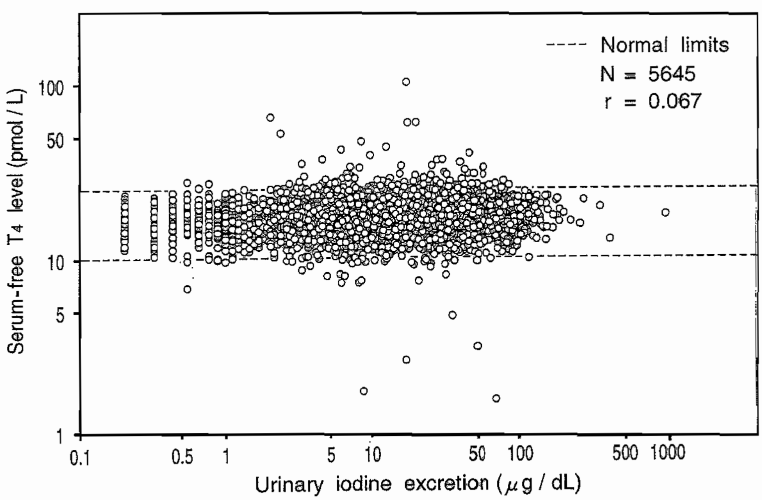

Fig. 6. Scatter plots of urinary iodine excretion and serum free T_4 level in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

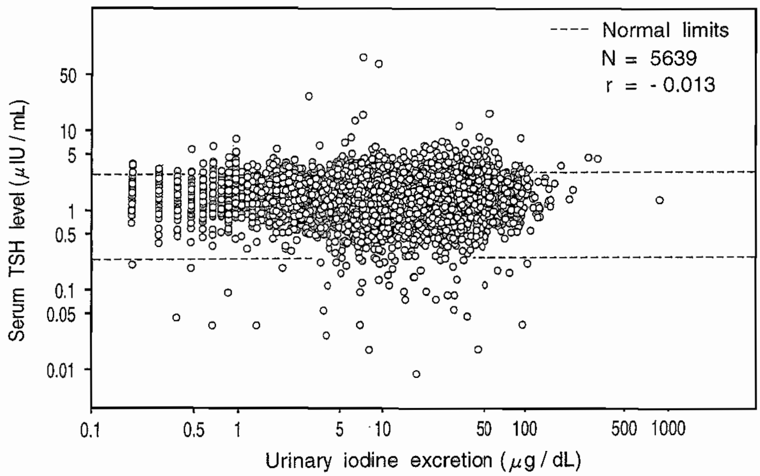

Fig. 7. Scatter plots of urinary iodine excretion and serum TSH level in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

tration and the residual of $\log_{10}$(thyroid volume) after adjustment for age, height and body weight shown in Fig. 8 indicates the significant correlation between urinary iodine concentration and thyroid volume.

To confirm the iodine deficiency in the Kiev region, we have carried out investigations on iodine content in natural water. A total of 114 water samples from 21 districts was analyzed. The iodine content in natural water ranged from 0.37 to 4.61 μg/dl, indicating the presence of an iodine deficiency in Kiev (Fig. 9).

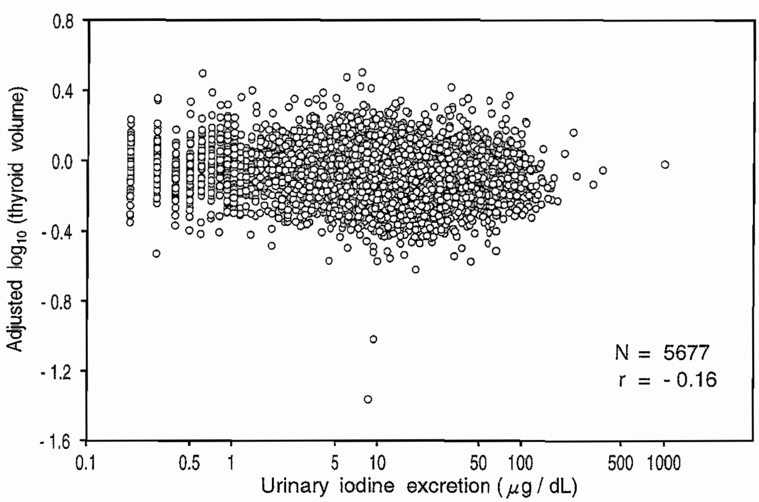

Fig. 8. Scatter plots of urinary iodine excretion and the residual of $\log_{10}$(thyroid volume) after adjustment for age, height and body weight in children aged 0—10 years at the time of the accident and examined at the five centers from May 1991 to April 1996.

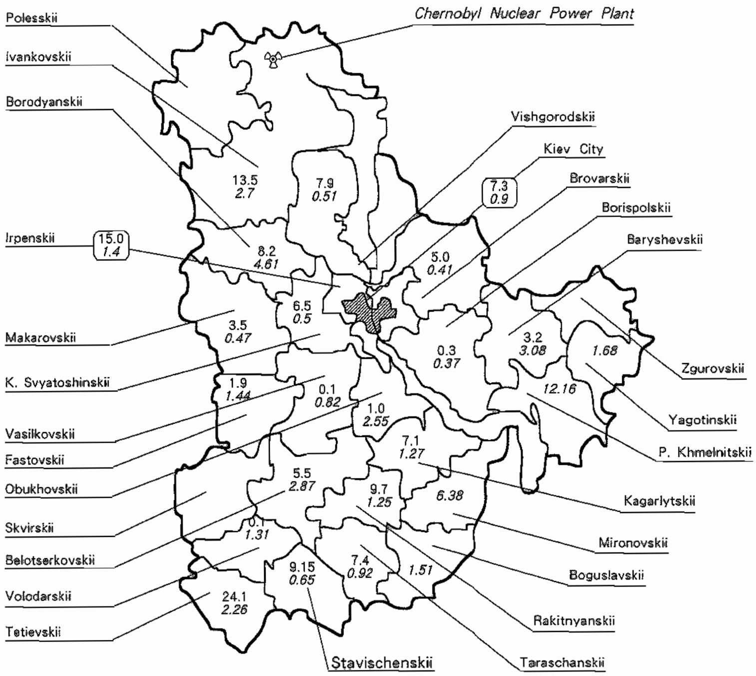

Fig. 9. Median level of iodine content (μg/dl) in urine and water (italics) among districts in Kiev region.

Summary

1. The thyroid volume of children was measured with an arch-automatic scanning ultrasonographic instrument and the criterion for goiter was established on the basis of a statistical model.
2. The prevalence of goiter varied widely among places of residence: from 18% in the Gomel region to 54% in the Kiev region.
3. No correlation was observed between the prevalence of goiter and the whole-body ^{137}Cs count per body weight (Bq/Kg) or the soil ^{137}Cs radiocontamination level (Ci/km^2) in the place of current or exposed residence.
4. The correlation between urinary iodine content and the prevalence of goiter, thyroid volume and serum free T_4 and TSH levels was analyzed.
   (i) A significant negative correlation was observed between the prevalence of goiter and the median level of urinary iodine content.
   (ii) A significant negative correlation was observed between urinary iodine content and the thyroid volume adjusted for age, height and weight.
   (iii) A significant negative correlation was observed between the serum free T_4 level and urinary iodine content, but the correlation coefficient was small.
   (iv) No significant correlation was observed between the serum TSH level and urinary iodine content.

5. The urinary iodine excretion level was low around Chernobyl. The median level of urinary iodine content was less than 10 μg/dl in the Bryansk, Kiev and Zhitomir regions while it was as high as about 17 μg/dl in the Gomel and Mogilev regions.
6. An endemic iodine deficient zone was confirmed in the Bryansk, Kiev and Zhitomir regions, but the individual urinary iodine level varied from low to high.

Conclusions

There is no evidence to support a correlation between the prevalence of goiter and radiation exposure by ^{137}Cs, and the high prevalence of goiter may be attributable to an iodine deficiency. Despite the difficulty of evaluating the causal relationship between goiter and radiation, it is necessary to clarify the internal radiation dose such as ^{131}I in individual children. Furthermore, a careful follow-up is needed in the children found to have goiter.

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Comments by Japanese specialists

Chernobyl: A Decade
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Comments on thyroid-related studies by the Chernobyl Sasakawa Health and Medical Cooperation Project

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In May 1991, medical examinations began on children living in the Chernobyl area who were aged 0 to 10 years at the time of the Chernobyl Nuclear Power Plant accident. This project has encountered significant problems during the past 5 years, including the dissolution of the Soviet Union, disruption of the medical community, and communications difficulties. Many problems had to be solved before medical support and collaborative research in the scientific field could be initiated.

Our first year was marked by much trial and error and many problems related to the introduction of new instruments, the supply of technical training, and the adoption of common diagnostic criteria. One achievement in 1992 was the first workshop, which has been held every year since then. These meetings of responsible persons and field staff members from the five centers have rewarded us with continued results each year. Particularly, since the fourth workshop in St. Petersburg we have been able to collectively report and evaluate results of medical examinations above and beyond national borders. The reason for this is that representatives of each center process all the data of the five centers and give reports on three areas: thyroid, hematology and dosimetry. These reports have been published annually since 1992 in both English and Russian, with comments from Japanese experts.

Since I have participated in this project from its inception and have learned much from the experience, I would like to take the opportunity of the completion of this 5-year study period to comment on the results of the thyroid examination program.

During the Kiev Symposium in October 1996, and according to the arrangements made at the 1995 workshop, the report on dosimetry was presented by the Mogilev Regional Medical Diagnostic Center; the report on thyroid by the Gomel Specialized Medical Dispensary, the Kiev Regional Hospital No. 2, and the Korosten Inter-Area Medical Diagnostic Center; and the report on hematology by the Klincy City Children's Hospital.

Now, as a thyroid specialist, I will comment on the four reports covering thyroid diagnostic data compiled from the five centers. This is simply a brief review focusing on data and is intended to show the reliability of the data and to avoid misunderstanding. Regarding past activities, please refer to the other comments made by my Japanese counterparts in the existing reports.

Reports from the Gomel Specialized Medical Dispensary

Gomel presented two reports that are arranged differently from the common protocol of the five centers. Since we have a high regard for the ideas of each center, we have not made any particular recommendations regarding the arrangement of data. However, several points require discussion.

Thyroid nodules and cancer

It is assumed that the sex and age distribution of those examined around Chernobyl are almost the same in each of the five centers, but this has not been precisely investigated. Moreover, this project was originally planned to examine as many children as possible from the outset as part of the humanitarian support based on the instructions of each health bureau and center. In addition to this situation, because radioactive contamination is especially heavy in the Gomel region and the rate of thyroid cancer is high, the Gomel Center's role is not only to conduct routine medical examinations, but also to accept patients referred by other medical institutions for extensive tests, and their numbers are increasing year by year. In other words, we must note that the examined subjects are likely to include patients with abnormal thyroid findings. Furthermore, as shown in Dr Shibata's epidemiological comments, a problem exists concerning statistic transactions. It can be presumed from the examples of adults that more thyroid nodules and thyroid cancers are found in the older subjects. However, more investigations are required regarding the accuracy of those figures. In addition, the fact that thyroid cancers occur more frequently in younger subjects, especially those aged up to 3 years old at the time of irradiation, does not prove that nodules occur in radiation-exposure victims of that same age group. That is to say, it is premature to conclude that the causality of thyroid cancers and thyroid nodules increasing with age is strongly related to irradiation. More cautious analyses are needed. As for the correlation chart between the rate of thyroid cancer and nodules at the five centers, it appears reliable only because of the strong influence of the figures from the Gomel region. Data on more cases as well as information on the degree of irradiation involving the whole body and the thyroid are needed. It is especially necessary to be careful about the data on the occurrence of thyroid cancers, as that irradiation data were acquired from the Institute of Biophysics of the Russian Federation and was taken from a group exposed to thyroid irradiation just after the accident. From the data on those who underwent thyroid irradiation, grouped by age, and those with thyroid cancer, grouped by age, it is evident that the thyroid cancers occurring around Chernobyl, especially in the Gomel region, are highly affected by radiation. As this is a very significant report, a new Chernobyl Sasakawa Project will begin to ascertain its accuracy.

Relationship between thyroid abnormality and absorbed dose

This report is a unique analysis by Dr Masyakin and others that caused controversy during the 5-year Chernobyl Sasakawa Project, which concludes that no meaningful correlation exists between the whole-body ^{137}Cs count (Bq/kg), soil pollution by ^{137}Cs (Ci/km^2), and each disease. This attempt should be regarded highly, but some points require clarification. First, the analysis uses borrowed data; in other words, although the source of the regional data of ^{131}I concerning thyroid irradiation is clear, the appropriateness of attributing the increasing thyroid nodules to irradiation counts and the rising rate of positive reactions of thyroid autoantibody (AMC) relies on the accuracy of diagnoses and radiation count evaluations. The results of AMC measurements should be considered with the differences in measurement methods and with other autoantibodies including ATG, TSH receptor antibody and TPO antibody. The re-examination of thyroid images and cytological studies on the existence of autoimmune thyroid diseases is also essential. Furthermore, it is necessary to investigate the relationship with the abnormal immune reaction of the whole body. Of course, diagnosis of the thyroid nodule is made by viewing ultrasonic images of the thyroid, but although the aim of the analysis was good, there were problems regarding multiple nodules as opposed to single nodules, and problems concerning definitive diagnosis of adenomatous goiter, both of which require a solution in the future. One subject requiring study is how to interpret the data of girls only, which is said to show a correlation between thyroid irradiation levels and AMC positivity. The threshold of the irradiation counts in question also requires review.

The above findings indicate the problems of the Gomel region only. However, many organizations are scientifically investigating the relationship between thyroid ^{131}I count and thyroid diseases. Unfortunately, however, the epidemiological methods of the Chernobyl Sasakawa Project do not compile sufficient medical data, even though the reproducibility and reliability of these medical data are high. This is because the project began to examine children living in the contaminated areas as quickly as possible at the request of the former Soviet Union. The project gave priority to the health effects on local residents, and introduced instruments and methods of the highest medical standards of that time in order to substantially improve the level of local medicine. Building on these results, a new project is now proceeding in Gomel, an area in which many problems persist. Estimates are that, after the year 2000, this epidemiological research will provide a definite conclusion. It is necessary to advance autonomous and cooperative medical services in Gomel as well as to introduce a scientific analyzing system. Therefore, I would like to request the cooperation of those concerned.

Report from Kiev Regional Hospital No. 2

An increase in children's thyroid cancer since 1992 has also been observed in the Ukraine. Two diagnostic centers were thus established, one in Kiev in the Kiev region and another in Korosten in the Zhitomir region. These centers have been providing service for 5 years and have encountered numerous challenges along the way. The Kiev Regional Hospital has reported on goiter in connection with iodine deficiency, as goiter occurs at an especially high rate in the area. As for thyroid volume, all five centers used the same devices and analysis methods, and employed a system of excellent reproducibility. As a result, the data were superb for objective evaluations, and we were able to make a highly accurate analysis over the past 5 years. Urine samples were not collected from all subjects. However, the devices for semiautomatically analyzing and measuring iodine were installed in Mogilev and Kiev, and since 1993 the local staff have been conducting accurate measurements. Urine samples are collected at a rate of approximately one in 10 people from each area and school, and from all people with abnormal thyroid findings. Because goiter occurs at a particularly high rate in the Kiev region, the iodine contents of well water, water supplies, and natural water are measured. The measurements show that the iodine content is very low. Analysis of the correlation of diverse parameters has revealed a negative correlation only in the thyroid volume and the iodine content of urine. Although further investigations are required, the differences in oral intake of iodine are significant, assuming the iodine content of the environment around Chernobyl is the same. It has been suggested that iodine is probably supplemented in Belarus, centering on Gomel. In the Kiev region, however, it is supposed that iodine has not been adequately supplemented. In this analysis, patients whose thyroid images showed evident abnormality and those who had positive reactions for thyroid autoantibody were excluded, as this analysis attempts to correlate simple goiter and iodine. Continued monitoring of the state of iodine supplementation and the prognosis of goiter is necessary.

Report from the Korosten Inter-Area Medical Diagnostic Center

Although a common diagnostic standard was introduced in those five centers, the image-taking methods and evaluation standards were not always the same for the diagnoses of thyroid images utilizing echoes. The quality of these methods and standards are only partially fixed. This fact brings to light a problem that cannot be evaded by the use of any echo devices. The calculations of volume have excellent reproducibility, but the qualitative diagnosis is limited. We must remember that, regarding the descriptions of a slight disorder in thyroid brightness or small hidden disease, the operators' subjectivity and difference in experience exert a considerable influence. Moreover, detection limitations should be considered. Nevertheless, during the past 5 years, the doctors at each center who diagnose thyroids with ultrasound have steadily improved their ability and have now reached a world-class standard. Consequently, many images of abnormal thyroids have been found in the Gomel region. On the other hand, the Korosten Inter-Area Medical Diagnostic Center that examines the northern part of the Zhitomir region has discovered fewer images of abnormal thyroids, although the occurrence of thyroid autoantibody is high. Of course, the sampling bias of medical examinations must be considered, but other reasons should also be investigated. This was the first indication that children with positive thyroid autoantibody were increasing in number by age, and it enabled us to conduct analyses in pursuit of a relationship with irradiation. As for the occurrence of hypothyroidism, notable patients are rarely found, but persons who have increased TSH are found at a certain frequency among latent patients, and the frequency is especially high in the Gomel region. It is necessary to investigate each case to determine whether it is due to chronic thyroiditis or to thyroid irradiation after the Chernobyl accident.

Regarding the frequency of images of abnormal thyroids acquired in this research, only the occurrence of positive autoantibody reactions increases with advancing age; thyroid nodules do not register any evident increase. Since this differs from the report of Dr Masyakin and others, further investigations are required. In particular, the data concerning the correlation between the amount of thyroid irradiation, the occurrence of thyroid nodules, and the occurrence of AMC require review.

The above findings are my comments, from my perspective as a thyroid specialist, on the reports of the three centers. I sincerely ask the reader to avoid making a unilateral interpretation when utilizing these examination data. As for summarization of the results of the examinations at the five centers for the 5-year period, we have trusted the ability and autonomy of local doctors to a considerable extent. However, as persons who have provided guidance and orientation for the local staff, we Japanese experts should share responsibility for the data accuracy and analysis methods. The many issues that remain to be resolved in the future include scientific analysis of accumulated materials and international joint research on the cause-and-effect relationship of irradiation. To ensure that a long-term follow-up system is established, continued support and cooperation to assist the local efforts are particularly needed.

Lastly, I would like to express my sincere appreciation to those concerned, including the local staff members who undertook the thyroid examinations. This brings to a close the 5-year period of cooperation of the Nagasaki University School of Medicine.

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Comments on the two reports from the Gomel Specialized Medical Dispensary

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Two challenging reports addressing the association between the Chernobyl accident and thyroid disorders in children are presented in this volume by medical staff of the Gomel Specialized Medical Dispensary. Adequacy of study subjects is the primary requirement in any epidemiological study. In the comparison of two groups, for example, comparability of the two groups should be checked carefully to avoid biases caused by the difference between the two groups in factors other than those of interest. The figures presented in the two reports seem to demonstrate a significant association between the prevalence of thyroid disorders and radiation exposure caused by the Chernobyl accident. However, readers will find some problems in the two reports regarding the comparability, as discussed below.

Thyroid nodules and cancer (Panasyuk et al., pp. 59–65)

Although not stated explicitly, the line of the authors' argument in Fig. 6 on p. 63 seems to be as follows:

1. The thyroid dose in children decreased on the average with the increase in age at the time of the accident.
2. The prevalence of thyroid cancer in children also decreased with the increase in age at the time of the accident.
3. The correlation between thyroid dose and prevalence of cancer was therefore demonstrated, and the probable impact of radiation on thyroid cancer incidence in the contaminated areas after the Chernobyl accident was indicated.

However, the prevalence was calculated from the results of examinations of about 120,000 children conducted by the five centers, while the thyroid dose was obtained only for about 1,600 children in Gomel. The authors, therefore, seem to have made the crucial assumption that the distribution of thyroid dose depends not on the children's place of residence but on the age at the time of the accident. Unfortunately, this assumption is not consistent with their assertion that Gomel is more highly contaminated than other areas.

Relationship between thyroid abnormality and absorbed dose (Masyakin et al., pp. 67–71)

This report is more challenging than the previous one in the sense that it directly addresses the dose-response relationship between thyroid dose and prevalence of thyroid nodules and positive AMC titers.

The authors first compared the main group and comparison group with respect to the prevalence of thyroid nodules and positive AMC titers, and then they compared the comparison group and the four subgroups of the main group which were defined by thyroid dose level.

Although not stated explicitly, they seem to have compared two groups by using the χ^2 test for the 2×2 contingency table. This test procedure is appropriate for comparing the comparison group and the main group as a whole. However, repetition of such a comparison for the comparison group and a subgroup is inadequate. Other methods such as logistic regression analysis should be used on the basis of individual (not grouped) data. Since only the grouped data are available in the report, the data could be reanalyzed using the Cochran-Armitage test, for example. By assigning the scores 0, 1, 2, 3, 4 to the five groups, i.e., control, 0–50, 50–100, 100–200 and $\geqslant$200 cGy, respectively, we observe a statistically significant dose-response relationship in the prevalence of thyroid nodules ($p = 0.01$) and positive AMC titers ($p = 0.04$) among girls. However, these results will not be valid if the following crucial assumption does not hold: the comparison group and the main group are comparable. It is questionable whether this assumption holds, even though the authors seem to have made it implicitly.

If the dose-response relationship really exists, a similar relationship should hold in the main group without referring to the "control". The Cochran-Armitage test applied to the main group still indicates a significant dose-response relationship in the prevalence of thyroid nodules ($p = 0.02$) but no significant dose-response relationship in the prevalence of positive AMC titers ($p = 0.38$) among girls. The nonsignificant results may be attributed to the reduced power of the test caused by excluding the "control", but I would suggest that the significant dose-response relationship is due to inclusion of inadequate control.

Recent development of statistical software has made it possible for people to analyze the data by themselves even without deliberating on epidemiological and statistical issues; data input and some key operations will suffice for obtaining results. However, such results will usually be far from those which the scientists originally sought.

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Chernobyl Sasakawa Health and Medical Cooperation Project: achievements in 5 years and future prospects

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Introduction

During the 5-year period from May 1991 (5 years after the nuclear power plant accident in Chernobyl) to April 1996, we examined the peripheral blood of 118,773 children aged between 0 and 10 years at the time of the accident.

The purpose of this study in the field of blood diseases was to: 1) determine the effects of radiation exposure on hematopoietic organs in children; 2) clarify the age-dependent physiological changes in peripheral blood counts; 3) accumulate laboratory test data and store currently available blood samples in a simple and inexpensive way for future research; and 4) improve the diagnostic ability of the physicians on a regional basis and promote exchange among hematology specialists in the concerned regions. Although, to our regret, not all of these goals have been fully attained in the 5-year project period, we should like to review the project by discussing these target themes individually.

Effects of the Chernobyl accident on hematopoietic organs in children

In order to determine the effects of the accident on hematopoietic organs in children, which was the primary goal of the project, it was essential to employ a screening method which would be the least demanding on the children and yet the most sensitive. Consequently, we used Sysmex's peripheral blood autoanalyzers K-1000 and NE-7000, which are capable of testing nine items with a small amount of blood (1 ml). To avoid infection from viruses such as HIV and HCV, we used disposable needles to draw blood and ensure that control blood had been confirmed as virus free. Both of these measures were unprecedented in the republics.

Hematological abnormalities were found in 18,573 children (15.6%). Eosinophilia, which accounted for 93.5% (17,374 children) was the most prevalent, followed by leukopenia (3.3%), anemia (2.6%) and thrombocytopenia (0.6%).

Most of the cases of eosinophilia and anemia were considered attributable to allergic diseases and iron deficiency, respectively. Eosinophilia probably occurred as a result of allergic reaction to parasites because it was transient and disappeared in two-thirds of the children at the time of re-examination, and because it was more frequent among children in rural areas. This assumption is substantiated by the fact that antihelmintic agents have been found to be effective by local physicians.

The low ferritin value in these children suggests that most of the cases of anemia were due to iron deficiency. Although the prevalence does not seem to be high, the iron deficiency is related to endogenous factors such as the greater iron demand and changes in the endocrine environment in growing children and to exogenous factors such as insufficient dietary iron intake due to the poor economic situation.

The prevalence of leukocytosis was highest next to that of eosinophilia. Most of the cases are thought to be due to the infections seen frequently in childhood. This also applies to the large number of patients with thrombocytosis in that the induction of cytokines accompanying infection, especially the elevation of IL-6, may have provoked transient thrombocytosis.

That leukocytosis and thrombocytosis have shown a similar year-by-year decrease is no doubt due to improvements in economic and hygienic conditions, but the fact that the subjects have grown less susceptible to infection with each passing year should not be overlooked.

The prevalence of eosinophilia drastically decreased from 25% in 1991 to 10% in 1996. This may be associated with the improved hygienic conditions and the shifting of the examination site from rural to urban areas.

These reactive blood disorders seem to be decreasing. However, 81 patients with leukopenia and 24 patients with thrombocytopenia were still found by re-examination. In order to identify the cause of leukopenia, the patients should be observed with the utmost care and their blood specimens must be re-examined carefully to determine whether the examination of hematopoietic function is necessary or not. A further investigation is needed to determine whether a slight increase in children with leukopenia in 1996 is a sign of a potential increase in hematopoietic diseases.

In the present study, a total of five hematological malignancies were found. Some were diagnosed for the first time by the examination; others had been diagnosed before and were included in the present examination group. In any case, the incidence was low. Interestingly, these patients were all under 2 years of age at the time of the accident, and there was a latent period of 7–10 years before onset. In order to determine if this common feature was coincidental, an epidemiological study must be conducted to check for an increase in tumors of the hematopoietic organs in the same age group.

As shown above, there was no correlation between the incidence of blood disorders, including hematopoietic malignancies, and either radiation dose at the time of the accident (extent of contamination) or whole-body cesium measurements. Therefore, as far as the results of the present examination reveal, the effects of the accident on the hematopoietic organs remain obscure. Future efforts should include the implementation of periodical follow-up studies on subjects with abnormal hematological data to disclose subsequent blood diseases. What can be done now at each facility is to carefully re-examine the blood specimens stored because of unspecified hematological abnormalities and to review the diagnoses.

Age-dependent physiological variation in children's peripheral blood data

It is known that the results of blood tests in childhood vary physiologically with age, but the number of subjects in the past was not sufficient to fully support this phenomenon. The present study saw the participation of a substantial number of subjects, but we have not as yet succeeded in setting the normal values by age. To do this, it must be ascertained that individual subjects are in good health. The files should be checked again to select the eligible subjects.

However, a certain variation tendency has been shown to accompany aging in childhood. In boys, Hb was found to gradually increase from around 13 g/dl in 10-year-olds to 15 g/dl in 17-year-olds. Hb was slightly decreased in girls older than 14 years, although the values remained in the normal range as described in Wintrobe's textbook. These changes are attributed to changes in endocrine environment. The decreasing tendency in girls is due to iron deficiency, which coincides with the frequent low ferritin values in girls older than 14 years.

Although the reason is unclear, MCV tended to be higher in girls than in boys, a finding that contradicts the iron deficiency tendency in girls.

No noticeable variation was seen in the median leukocyte count. The values for 5- and 6-year-olds are somewhat high, but are slightly decreased in 7-year-olds and level off thereafter. In the differential leukocyte counts, the lymphocytes accounted for a relatively high proportion in 5- and 6-year-olds, whereas neutrophils were more predominant in those older than 7 years.

The platelet count also tended to decrease with the increase in age. It would be interesting to pursue the control mechanism of thrombocytopoiesis in order to determine what physiological control works to bring about the change in the platelet count. Further studies are needed to clarify the involvement of various factors in the variation of physiological platelet counts, such as thrombopoietin and other hematopoietic growth factors and cytokines, the development of the liver and the kidneys and the macrophages and lymphocytic series which produce the above substances.

To summarize, an age-dependent variation in peripheral blood cell counts was observed in the age range between 5 and 15 years, and this variation was found to be closely related to the growth of children in this age group.

Accumulation of test data and preservation of blood specimens

The data of the present examination reflect only the hematopoietic condition of individuals at certain points in time. The data should be collected periodically from the same subjects over the years.

The present data, however, can serve as control values if any of the subjects included in the study develop some disease of the hematopoietic organs in the future, and indeed a review of the specimens and data will be useful in detecting signs of any such disease.

It is hoped, therefore, that health surveys will be conducted regularly on the children examined in the project and that a system for registering various diseases will be established locally and internationally. Furthermore, the data accumulated in the present study should be made easily accessible to all researchers. In this way, the project will contribute continuously to the field of medicine.

In view of the need to preserve the blood specimens for future studies, one each from the specimens subjected to leukocyte classification and from those fixed in alcohol without staining have been kept for each subject. Thus, the specimens can be re-examined whenever any doubt arises and can be used for future DNA research if necessary. Although we could not determine the clinical effects of radiation on the hematopoietic organs, we believe these specimens will be useful in revealing radiation effects at the DNA level and will provide control DNA when a blood disease develops in the future. When radiation effects at the DNA level can be analyzed by a more accurate method than that currently available, these specimens will be even more useful. They should therefore be filed appropriately and stored under proper conditions to prevent their loss.

Storage of the cells themselves at a temperature from −80°C to −120°C is preferable. Since a large number of subjects were involved in the present project, however, we opted to store blood specimens in view of the cost and because no special technique was required to prepare the specimens for storage.

It remains to be determined whether the DNA obtained from these specimens will be as equally useful as the frozen cell-derived DNA for DNA research and where the critical point, if any, lies.

Improving the diagnostic ability of physicians in each center

Owing to the enthusiastic efforts of the physicians in hematology-related fields at each center and the supply of state-of-the-art testing devices, the level of accuracy in diagnosing blood diseases and the precision and efficiency of laboratory testing have greatly improved. This has been demonstrated by the similar test results obtained by various centers and a greater reliability shown by local residents and hospitals on these tests. Periodic exchange of personnel in charge and local procurement of supplies will be the key to keeping up the current standards.

We believe that at least 80% of what had been intended was achieved in the 5-year period. Although the effects of radiation on the hematopoietic organs are not clear at present, regular follow-up studies on the subjects with abnormal findings and an intensive examination of people in highly contaminated areas must be continued for humanitarian as well as scientific reasons.

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Pediatric thyroid diseases around Chernobyl: morphological aspects of the Chernobyl Sasakawa Health and Medical Cooperation Project

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Introduction

A high frequency of thyroid carcinoma has been reported as a result of external irradiation or radioactive fallout among atomic bomb survivors [1] and among people exposed to radiation in the Marshall Islands [2]. An increase in thyroid cancer has also been observed 4 years after the Chernobyl accident among children in the Republic of Belarus and Ukraine [3,4]. In Russia an increase of pediatric thyroid cancer was documented in 1994. The reported rate of childhood thyroid cancer in Belarus has exceeded 100 cases per million children per year. In most national tumor registries the childhood thyroid cancer rate is between 0.5 and 3, and so the scale of the reported increase is dramatic [5]. Although relatively extensive studies on thyroid cancer have been conducted in Belarus and other nations through the national tumor registry [6], further studies are necessary to clarify the pathogenesis of thyroid malignancy among children and its relationship to radioactive fallout.

Five years have passed since thyroid screening started as part of the Chernobyl Sasakawa Health and Medical Cooperation Project (CSHMCP) in five regions around Chernobyl in Belarus, Ukraine, and Russia. In this project we performed fine-needle aspiration cytological biopsy (FNAB) on a large number of children. In addition, the following parameters were examined on the basis of the results of FNAB: 1) the prevalence of thyroid diseases around Chernobyl; 2) the cytological and histological characteristics of pediatric papillary carcinoma; and 3) the morphological features of the Chernobyl cases as compared to those of Japanese cases.

Screening study on thyroid abnormality

The centers involved in the CSHMCP are located in Mogilev (Belarus), Gomel (Belarus), the western part of Bryansk (Russia), Kiev (Ukraine), and Zhitomir (Ukraine). These five centers cover areas with various degrees of radiocontamination [7,8]. Health screening services were provided for children aged between 0 and 10 years old at the time of the accident. From May 1991 to December 1994, 86,476 children (41,653 boys and 44,823 girls) were examined. The number of subjects was 17,775, 14,054, 17,251, 18,672, and 18,724 in Mogilev, Gomel, Bryansk, Kiev, and Zhitomir, respectively (Table 1). Screening with an arch-type ultrasonographic instrument (Aloka 520) with data storage revealed thyroid abnormalities such as nodular lesions, cystic lesions, and abnormal echogenity in 2,505 children (2.9%). The prevalence of thyroid abnormalities detected by ultrasonography was 1.39, 6.30, 3.31, 2.67 and 1.47% in Mogilev, Gomel, Bryansk, Kiev and Zhitomir, respectively (Table 1).

Ultrasonographical abnormalities over 5 mm in diameter such as nodular lesions, cystic lesions and abnormal echogenity were chosen as targets for FNA. FNA was carried out with an echo-guided syringe pistol (Chiba University type) made to fit a 20-ml plastic syringe with a 22-gauge needle. Subjects were reevaluated by Aloka 630 ultrasonography using a real-time scanner with a 7.5 MHz probe, and over 500 subjects received FNAB according to the same biopsy criteria in the five centers. The aspirate was smeared on a microscopy slide, and then stained with Papanicolaou (Pap) and/or May-Grünwald-Giemsa (MGG) stain.

The diagnostic criteria for each disorder were as follows: papillary carcinoma featured intranuclear cytoplasmic inclusions, nuclear grooves and irregular

Table 1. Number of subjects screened and ultrasonographical abnormalities (May 1991–December 1994).

	Number of subjects examined			Ultrasound abnormalities	%	Number of nodules	%	Number of cancers	%
	Boys	Girls	Total						
Belarus									
Mogilev	8700	9075	17775	247	1.4	21	0.12	2	0.011
Gomel	6766	7288	14054	885	6.3[b]	254	1.8[b]	19	0.14[b]
Russia									
Bryansk	8636	8615	17251	571	3.3[b]	102	0.59[b]	4	0.023[b]
Ukraine									
Kiev	8884	9788	18672	499	2.7[b]	30	0.16[b]	6	0.032[b]
Zhitomir	8667	10045	18724	276	1.5[b]	52	0.28[b]	5	0.027[b]
Total	41653	44823	86476	2505	2.9	459	0.53	36	0.042

[a]$p < 0.05$, [b]$p < 0.01$ vs. Mogilev (χ^2 test). All subjects were under 19 years of age. Cancer cases were found by ultrasonography and/or FNAB, and were confirmed histologically using surgical specimens.

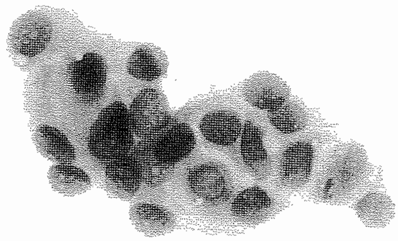

Fig. 1. Cell cluster of a papillary carcinoma. Intranuclear inclusions and nuclear groovings were identified in the papillary carcinoma (MGG).

nuclear outlines in a cellular cluster (Fig. 1), while follicular neoplasm featured many equal-sized microfollicular nests or rosette-like clusters (Fig. 2). The criteria for medullary carcinoma were dispersed cell pattern, cuboidal or rounded cells with oval, eccentric, pleomorphic nuclei uniform hyperchromasia, red cytoplasmic granularity (MGG), and presence of amyloid. Chronic thyroiditis was diagnosed when many small lymphocytes and scattered plasma cells were encountered (Fig. 3). Adenomatous goiter was diagnosed when follicular cells in sheets and clumps of various sizes, foamy cells, degenerative erythrocytes, and colloid were observed. The multiplicity of nodular and cystic lesions was taken into consideration for diagnosis of adenomatous goiter by ultrasonography. Cysts featured macrophages and colloid aspirate without epithelial cell clusters. Smears

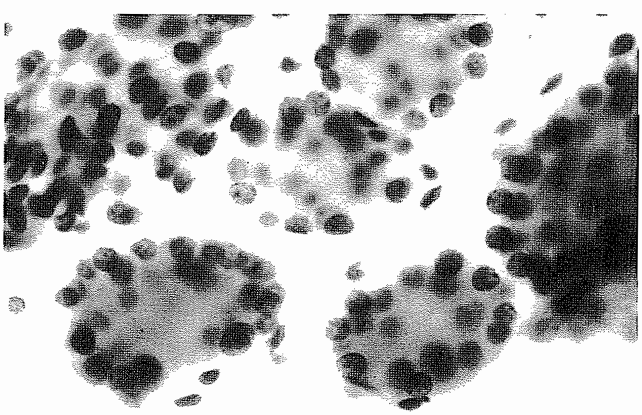

Fig. 2. Follicular neoplasm. Uniform-sized microfollicular nests were present (Pap).

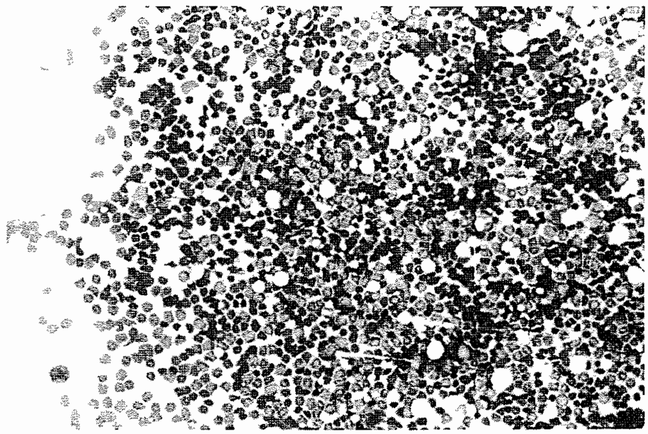

Fig. 3. Chronic thyroiditis. Numerous and various kinds of lymphocytes were observed (MGG).

showing only bared nuclei or normal follicle cells without a proliferative nature were unclassified. The main lesion was registered for cytological diagnosis in this study when more than two lesions coexisted in a single case.

Cytological aspects of pediatric thyroid diseases

A sample was successfully obtained for diagnosis from 446 subjects. The results of FNAB are shown in Table 2. Papillary carcinoma was found in 32 (7.2%) of the 446 subjects. Two cases of medullary carcinoma (0.4%) were found. All cases of thyroid cancer were confirmed histologically in the surgical specimens. Follicular neoplasms were found in 46 subjects (10.3%). Adenomatous goiter and cysts were found in 100 (22.4%) and 102 subjects (22.9%), respectively. Chronic

Table 2. Childhood thyroid diseases around Chernobyl (May 1991—March 1996).

Country center	Number of subjects	Cytological diagnosis						
		Papillary carcinoma	Medullary carcinoma	Follicular neoplasm	Adenomatous goiter	Cyst	Chronic thyroiditis	Unclassified
Belarus								
Mogilev	32	1	0	1	7	11	7	5
Gomel	111	22	0	14	20	27	24	4
Russia								
Klincy	102	4	2	7	39	25	20	5
Ukraine								
Kiev	30	1	0	1	4	8	7	9
Korosten	171	4	0	23	30	31	59	24
Total	446	32	2	46	100	102	117	47
(%)		(7.2)	(0.4)	(10.3)	(22.4)	(22.9)	(26.2)	(10.5)

thyroiditis was found in 117 subjects (26.2%). Characteristic epithelial hyperplasia and/or Askanazy cells were frequently encountered in chronic thyroiditis (Fig. 4). Of the children with chronic thyroiditis, 84.8% were positive for antithyroglobulin and/or antimicrosome antibodies, positivity being defined as a titer over × 100 in the hemagglutination test. Among the nonchronic thyroiditis cases, 24.8% were antibody positive. Table 3 shows the classification of the 446 subjects by FNAB diagnosis and ultrasonographical abnormalities. Most cases of papillary carcinoma and follicular neoplasm were found in subjects showing a nodule pattern by ultrasonography, while chronic thyroiditis was detected mainly in subjects showing abnormal echogenity.

We evaluated cytological findings of papillary carcinoma in 20 cases with sufficient tumor tissue samples collected by FNAB (Table 4). Most cases had a growth pattern of monolayered cellular sheet. Papillary cell cluster was present in 85% of cases. Follicular structure was colocalized in 35% of cases. Intranuclear cytoplasmic inclusions and nuclear grooves were present in 75 and 85% of cases, respectively. Psammoma bodies were well demonstrated in 50% of cases, and many of these represented a few clustering foci of psammoma bodies (Fig. 5). Mutlinucleated giant cells, stromal core and oxyphilic change were observed in 45, 45 and 20% of cases, respectively. The degree of nuclear atypism was classified into three grades as follows: grade 1 = mild; grade 2 = moderate; and grade 3 = severe. No cases showed simply grade 1. The number of cases with mild and moderate nuclear atypism (grades 1 + 2, 2) and prominent nuclear atypism (grades 2 + 3, 3) were seven (35%) and 13 (65%), respectively. Nuclear atypism seems to be correlated with the extent of solid proliferation observed histologically. In 75% of cases showing grade 3 atypism, the solid component occupied more than 60% of the tumor area. A relatively high grade of nuclear atypism might reflect the poorly differentiated nature of a tumor [9].

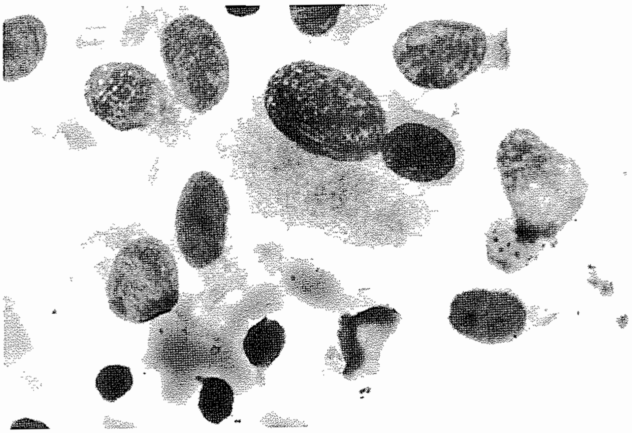

Fig. 4. Askanazy cells in chronic thyroiditis. Swelling epithelium with granular cytoplasm was characteristic (MGG).

Table 3. Classification of 446 subjects by ultrasonographic findings and fine-needle aspiration cytology (FNA) diagnosis (May 1991–March 1996).

FNA cytology	Ultrasonographical findings			Total
	Nodule	Cyst	Abnormal echogenity	
Papillary carcinoma	30	1	1	32
Medullary carcinoma	1	0	1	2
Follicular neoplasm	44	2	0	46
Adenomatous goiter	46	50	4	100
Cyst	16	80	6	102
Chronic thyroiditis	10	7	100	117
Unclassified	7	19	21	47
Total	154	159	133	446

Histological aspects of pediatric thyroid cancer

Up to June 1995, 29 children underwent thyroidectomy on the basis of a final diagnosis of thyroid cancer in Gomel. The number of cancer cases and the soil contamination level in each rayon are shown in Fig. 6. The prevalence of thyroid cancer ranged widely from 0 to 1.19% in 21 rayons and 0.13% overall in Gomel Oblast. There were 20 girls and nine boys ranging in age from 5 to 17 years old with a mean age of 11.3 years old at operation. The age at the time of the accident ranged from 0.2 to 9.1 years old with a mean of 3.3 years old. Characteristically, younger children, especially those under 1 year old (eight cases, 28%) were prone to papillary carcinoma. The period between the accident and operation varied from 5.2 to 9.2 years old with a mean of 8.0 years old. Although the patients were found in nine of the 21 rayons of Gomel Oblast, 14 cases (48.3%) centered in the Gomelskii rayon, probably due to a greater number of screening subjects in this rayon. Two patients changed places of residence inside the oblast after the accident.

Table 4. Cytological findings of papillary carcinoma in 20 children.

Findings	Number of cases with the finding (%)
Intranuclear pseudoinclusion	15 (75%)
Nuclear grooving	17 (85%)
Papillary structure	17 (85%)
Monolayered sheet	19 (95%)
Follicular structure	7 (35%)
Psammoma body	10 (50%)
Hyalinized stroma	9 (45%)
Multinucleated giant cell	9 (45%)
Oxyphilic change	4 (20%)

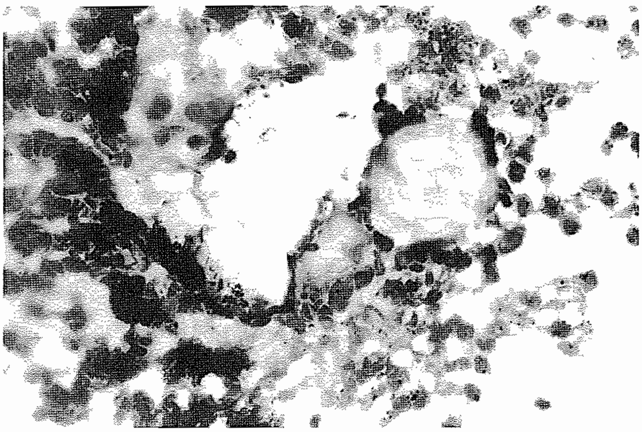

Fig. 5. Psammoma body was recognized as concentric lamellae with double refraction (MGG).

The tissues had been routinely fixed in formalin solution and embedded in paraffin, and the sections had been stained with hematoxylin and eosin. A pathological review was conducted to establish and confirm the diagnosis and classification of thyroid cancer according to the WHO classification. The diagnosis of lymph-node metastasis was based on the clinical charts at operation and confirmed by available histological slides. The average tumor diameter was 1.34 cm (minimum 0.8, maximum 3.0 cm). Most cases showed a single tumor, but multiple tumors were encountered in six cases. All cases showed a papillary growth pattern to varying degrees but typical nuclear features, i.e., ground-glass appear-

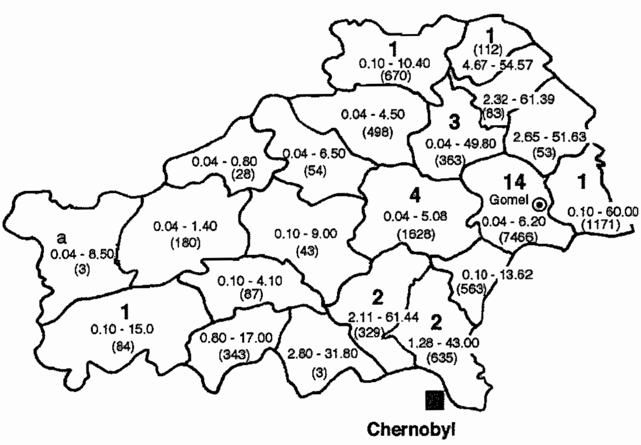

Fig. 6. Number of thyroid cancer cases and ^{137}Cs contamination level (Ci/km^2) in the rayons of Gomel Oblast. [a]Minimum and maximum ^{137}Cs levels of contamination. Figures in bold are the number of cancer cases in each rayon, and the numbers in parentheses express the number of subjects in each rayon.

ance, grooves and intracytoplasmic pseudoinclusions (Fig. 7). Two follicular variant cases and one solid variant case were encountered. In the follicular variant case, the papillary pattern was present in the metastatic lymph nodes. In the other cases, papillary, follicular and solid patterns sometimes intermingled even in the same section to various degrees. Tumor differentiation was relatively poor in 18 cases (62.1%) with a focus of solid proliferation occupying more than 20% of the whole tumor. Thirteen cases (44.8%) showed a solid pattern occupying more than 60% of the tumor, indicating poorly differentiated papillary carcinoma (Fig. 8). Intralobular and perifollicular fibrosis was a common finding. Thick stromal fibrosis (Fig. 9) was encountered in 18 cases, and psammoma bodies (Fig. 10) were encountered in all cases. Both components were present independently or colocalized in various manners. In a case of solid variant papillary carcinoma, significant stromal fibrosis was not present. Lymphocytic infiltration was encountered in 17 cases to various degrees, and diffuse and lymphoid follicle formation with germinal centers occurred in five cases (Fig. 11). Three of these five cases showed high serum antibody titers (antimicrosome antibody and antithyroglobulin antibody), but the other cases with or without lymphoid follicle formation were negative. Local invasion to surrounding fat and fibrous tissues was observed in 11 cases. Neither vascular hyperplasia with hyalinization nor atypical fibroblasts in stromal fibrosis, which are recognized as late irradiation effects, were encountered in our series. Cervical lymph-node metastasis was confirmed in 21 cases (72.4%) histologically, but no histology slides were available in the other three cases in which lymph-node metastasis was reported in the operation records. Psammoma bodies were also observed in the metastatic lymph nodes.

Histological comparison with Japanese cases

To evaluate the histological differences in pediatric cancers between radioconta-

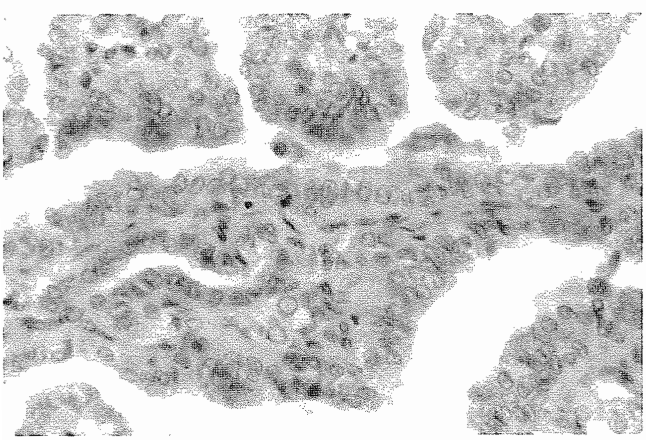

Fig. 7. Intranuclear inclusions and nuclear groovings were identified in the papillary carcinoma (H&E).

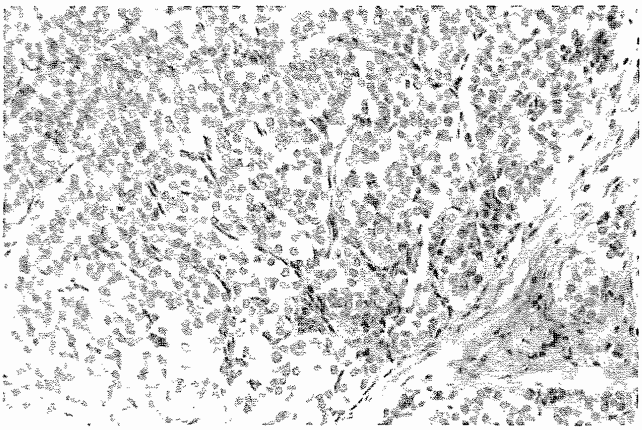

Fig. 8. Solid proliferation nest was one of the histological characteristics of Chernobyl pediatric papillary carcinoma (H&E).

minated and noncontaminated areas, we compared Gomel cases with Japanese pediatric cases. Japanese cases were kindly contributed from Kuma Hospital (Kobe, Japan) and Ito Hospital (Tokyo, Japan), which are the largest hospitals in Japan specializing in thyroid diseases. A total of 38 consecutive cases under 15 years old were accumulated over the past 20 to 30 years. The observation points were the same as those in Chernobyl cases. A summary of the comparison is presented in Table 5. The prepondency of papillary carcinoma was similar to the Chernobyl cases, but the percentage was lower. The tumor size in the Japanese cases was significantly greater than that in the Belarus cases, suggesting that the tumors in the latter were found at an early stage by screening. The tumor components of papillary carcinoma were quite different from those in the Chernobyl cases, i.e., papillary growth-rich cases, or the so-called adult type, were common

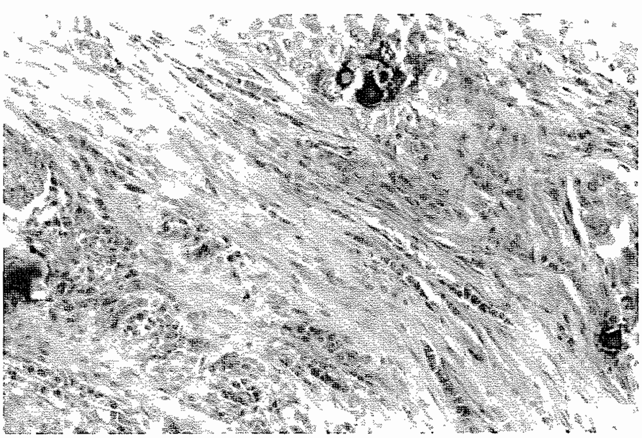

Fig. 9. Marked fibrosis was frequently observed (H&E).

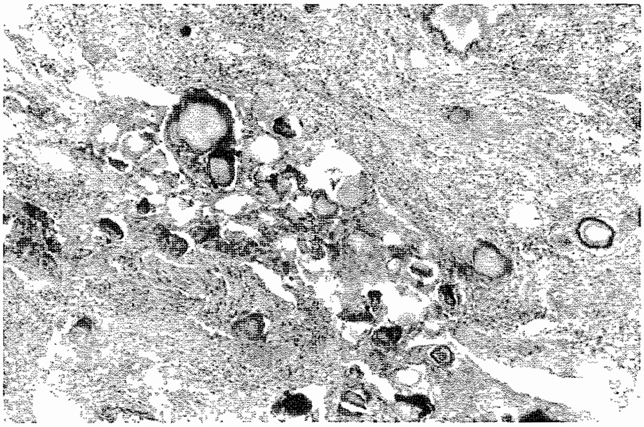

Fig. 10. Numerorus psammoma bodies were encountered in the fibrous stoma of papillary carcinoma (H&E).

among the Japanese cases. In contrast, solid proliferation, regarded as a poorly differentiated element, was significantly greater among the Chernobyl cases. The severity of fibrosis and psammomatous body deposition was significantly greater in Gomel cases.

Expression of ret proto-oncogene

Immunohistochemistry of anti-ret proto-oncogene product (polyclonal, C-19, Santa Cruz) was performed in Gomel and Japanese cases. This antibody particularly recognizes ret proto-oncogene and rearranged oncogene-encoded proteins.

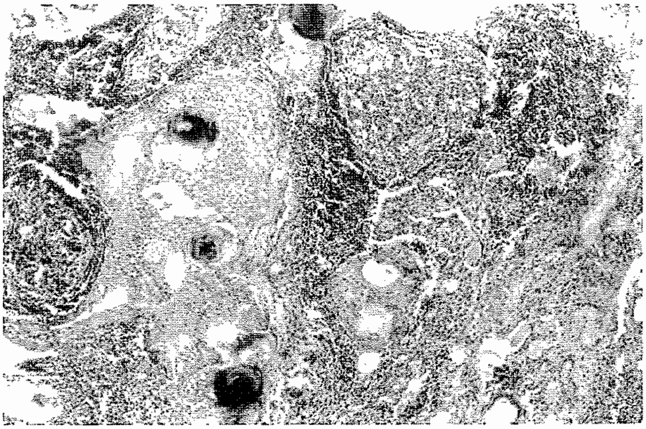

Fig. 11. Lymphocytic infiltration with germinal centers was encountered (H&E). Psamomma bodies were also present in the tumor nests (H&E).

Table 5. Comparison of papillary carcinoma components in 34 Japanese and 29 Belarussian children.

Component	Japan	Belarus
Solid rich (occupied more than 60%)	11.8%	44.8%
Follicular rich (occupied more than 60%)	14.7%	17.2%
Follicular variant	0.0%	6.9%
Papillary dominant	50.0%	10.3%
Others	23.5%	20.8%

All the Gomel and Japanese cases were immunopositive for this antibody. Immunoreactivity was detected in the tumor cell membrane (Fig. 12). There was no difference in staining pattern or intensity between solid proliferation and papillary component.

Discussion

The prevalence of childhood thyroid abnormalities has been reported in a number of countries [10–12], but the findings vary widely depending on the investigators and the locality. Early screening was done by an international cooperative group 4.5 years after the Chernobyl accident, and the group concluded that the prevalence of thyroid nodules was the same in the populations sampled from highly contaminated and control settlements [13]. At the present time there is consensus about the high incidence of thyroid abnormalities in the highly contaminated area. These facts suggest that long-term follow-up studies should be organized through international scientific cooperation, and an established common examination protocol should be implemented in these epidemiological studies to achieve a sufficient level of comparability. In this sense the CSHMCP is a

Fig. 12. Immunohistochemistry of ret oncogene product. Tumor cell membrane was immunopositive for anti-ret oncogene product in papillary carcinoma of Belarus and Japanese cases (ABC, DAB colorization).

rational project for thyroid screening. Our findings, obtained 5 to 9 years after the accident, showed a higher prevalence of thyroid abnormalities than that reported in other epidemiological studies on endemic and nonendemic goiter. The prevalence of thyroid abnormalities detected by ultrasonography was significantly higher ($p < 0.05$ by χ^2 test) in the relatively heavily contaminated regions (Gomel and Bryansk) than in the less contaminated region (Mogilev). This study will serve as an important database for further analyses, and the findings suggest that childhood thyroid diseases, including both neoplasms and immunological disorders, can be considered an ideal follow-up disease for monitoring the late effects of radioactive fallout [14].

Latent (occult) thyroid carcinoma is rarely observed at autopsy in adolescents [15]. Recently, the incidence of latent thyroid carcinoma in Minsk, Belarus was investigated in 215 adult autopsy cases aged between 19 and 88 years old. Carcinoma was found in 20 cases (9.3%). All the patients were over 40 years old, and all except one of the tumors were papillary carcinoma smaller than 5.0 mm in diameter [16]. In our series, the mean tumor size was 13 mm with a minimum diameter of 6.0 mm. These facts suggest that the increase in childhood thyroid cancer is due, not to the detection of occult carcinoma, but to other factors such as radiation exposure. It is unlikely that the detection of dormant or latent cancer was increased by meticulous screening, as indicated previously [17], because a histological review of many cases of operated papillary carcinoma showed aggressive local invasion and a high incidence of regional lymph-node metastasis.

The age factor is very important for radiation-induced tumorigenesis in thyroid diseases. It is well known that one of the etiologic factors in thyroid cancer in young persons is external radiation administered for treatment of diseases of the neck and head region during early childhood. In our series younger children, especially those less than 1 year old (eight cases, 28%) were prone to papillary carcinoma. Similar results were reported by Nikiforov et al. [18]. The highest number of patients that subsequently developed thyroid carcinomas was in the group less than 1 year of age at the time of the Chernobyl accident, and this number decreased progressively through to the age of 12 years. Conversely, none of the patients with benign lesions was less than 2 years old at the time of the accident, and an exposure age of 5—6 years old was the threshold separating significant prevalence of malignant tumors in younger children from the more frequent benign lesions in older patients.

No cancer can be regarded as radiation-induced unless the period between exposure and onset is at least 5 years. Indeed, thyroid cancer was observed over 10 years after exposure among Hiroshima and Nagasaki atomic bomb survivors and among Marshallese [1,2]. In our series, the mean latent period was 7.5 years. This is a little longer than the 5.8 years reported by Nikiforov et al. [19]. This discrepancy is probably due to the fact that we analyzed cases up to 1994 while their cases were up to 1992. A recent report suggested that the latent period of follicular carcinoma is greater than that of papillary carcinoma, since the first case of thyroid follicular carcinoma in the exposed Belarussian children was diagnosed after a latent period of 6.5 years, as compared with 4 years of minimal latency for post-Chernobyl papillary carcinomas.

The increase in incidence of carcinoma was proportional to the thyroid dose in patients with therapeutic X-ray irradiation, in atomic bomb survivors and in Marshallese. In the Chernobyl accident, large amounts of short-lived iodine isotopes were released in the fallout. In addition to external exposure from fallout, the absorption of radioiodines resulted in serious internal exposure to the thyroid in the early stages, although these were too short-lived to be measured at the present time. Later, internal exposure caused by longer-lived isotopes such as cesium, strontium and plutonium might play a minor role. The relationship between low-dose exposure and thyroid cancer has not been clarified. Alternatively, the continuous exposure to low-dose radiation over a long period in the contaminated area may influence the thyroid directly or indirectly in children who are susceptible to radiation. A histological review of benign thyroid lesions conducted in Minsk showed that cystic adenomatoid nodules of papillary type and diffuse hyperplasia with cellular atypia and nodularity seem to be commonly associated with radiation exposure to the thyroid gland [19]. There are still many children dwelling in the radiocontaminated areas and ingesting contaminated food around Chernobyl. In the cancer cases in Gomel Oblast, the median level of whole-body ^{137}Cs was 47.9 Bq/kg, which is considerably higher than the average level of 2.3 Bq/kg reported in the past for the former Soviet Union [20]. The mean soil contamination value of 5.17 Ci/km^2 in the place of residence is also far higher than the background ^{137}Cs level of 0.094 Ci/km^2 in Nagasaki in 1990 [21]. Although no significant dose-response relationship was confirmed, our study showed that most pediatric cancer cases occurred in the background of low-level radiocontamination. Vascular hyalinization and atypical fibroblast in stromal fibrosis are recognized as histological evidence of late irradiation effects and are found in radiation-induced tumors. However, these findings were not encountered in our series. We presume that findings of this sort occur after relatively high doses of irradiation, i.e., therapeutic external irradiation.

Papillary carcinoma is a predominant type of pediatric thyroid cancer both around Chernobyl [18] and among atomic bomb survivors in Nagasaki and Hiroshima [22]. Nikiforov et al. conducted a detailed review of pediatric thyroid cancers with and without a history of prior radiation exposure [19]. The histological characteristics vary widely among investigators, but generally the cancers observed among children in Western countries and Japan are similar to those in Gomel irrespective of a history of irradiation. There is a report emphasizing that prior exposure to head and neck radiation tends to increase the aggressive behavior of cancer in exposed as compared to nonexposed children [23]. The comparison of morphological differences between Belarus and noncontaminated nations is one approach to assess the influence of irradiation on the pathogenesis of thyroid cancer around Chernobyl. Although the predominant type of pediatric cancer was papillary carcinoma in both Belarus and Japan, the subtype of papillary carcinoma was quite different. The solid-follicular subtype was common in Belarussian cases, while the papillary-rich (adult) type is most common in Japanese and English cases. High incidences of poorly differentiated component (solid component), stromal fibrosis and psammoma bodies are also common findings in Chernobyl cases [24]. These distinct differences in subtype and tumor elements might reflect the different pathogenesis of thyroid cancer.

No report is available on the cytological findings in pediatric papillary carcinoma around Chernobyl. In general, psammoma body is specific for papillary carcinoma, but the rate of detection of this structure by FNAB was usually only around 20–25% of cases. In our series, psammoma body was observed in 50% of cases by FNAB, a finding that might reflect the histological characteristics of pediatric papillary carcinoma in this area because psammoma bodies were present in all cases histologically. In conclusion, the key diagnostic findings of pediatric papillary carcinoma around Chernobyl are the same as those of adult cases, although the cytopathologic features of Chernobyl cases were somewhat characteristic compared with those of adult papillary carcinoma. The relatively prominent nuclear atypism and high prevalence of psammoma body seemed to be particularly specific to Chernobyl cases [9].

The iodine content in the natural environment is low in Belarus and Ukraine. It is well known that iodine deficiency is an important factor in the etiology of endemic goiter. In experimental studies, low iodine is a potent promoter for thyroid follicular carcinoma. In contrast, the incidence of papillary carcinoma is relatively high in countries with a rich iodine intake [25]. But the expected high incidence of follicular carcinoma around Chernobyl was not confirmed. The papillary carcinoma preponderance in Chernobyl cases seems to be related to factors such as age or radiation exposure rather than iodine deficiency.

Although epidemiologically documented, a direct correlation between thyroid cancer and radiation exposure has not been definitely proven at the molecular level. Oncogenic rearrangements of RET proto-oncogenes are frequently detected in papillary thyroid carcinomas. Several studies have shown an association between ionizing radiation and development of this tumor type. Somatic rearrangement of the ret proto-oncogene was frequently detected in papillary thyroid carcinoma, particularly from adult Europeans. A recent report demonstrated that the same rearrangement was observed in approximately 60% of papillary carcinomas of children from areas contaminated by the Chernobyl accident [26], suggesting that ret rearrangement was induced as a direct consequence of radiation exposure. Moreover, in vitro irradiation of tumor-cell lines induced rearrangements of RET similar to those observed in human papillary thyroid carcinomas. These two observations could be related to the reported increased incidence of papillary thyroid carcinomas in children living in contaminated areas around Chernobyl. However, the high frequency of RET positivity in radiation-exposed children does not rule out the possibility that age could also play a role in the development of RET-positive tumors. To assess this possibility a relationship between the presence of RET oncogenic rearrangements and age was examined and the results show that the frequency of RET activation is significantly higher in the group of patients aged between 4 and 30 years old, thus supporting the concept that age could be contributing to this thyroid-specific carcinogenic process [27].

Our results provide epidemiological evidence of cytologically diagnosed childhood thyroid diseases among 86,476 children and suggest a high incidence of thyroid cancer and possibly also of autoimmune thyroid disease around Chernobyl. Chronic thyroiditis was the most common cause of nontoxic goiters in childhood, accounting for 25 to 40% of these goiters [11,28]. In the present study, chronic thyroiditis was found in 26.2% of the children showing thyroid abnormality, this value being similar to that in other studies. From the calculations illustrated in the previous paragraph, we obtained the estimated number of children with chronic thyroiditis among children examined in the five regions as follows (prevalence in parentheses): 28 (0.23%) in Mogilev, 171 (1.9%) in Gomel, 133 (1.1%) in Bryansk, 58 (0.55%) in Kiev and 46 (0.41%) in Zhitomir. The difference in the prevalence among the five regions is significant ($p<0.01$ by χ^2 test) and it is suggested that the prevalence of this disorder was largest in Gomel and smallest in Mogilev. This difference may indicate a relationship between radioactive fallout and the occurrence of chronic thyroiditis, but accurate data on individual radiation exposure must be collected and further analyzed. One study suggestive of this possibility showed a significantly high incidence of chronic thyroiditis among atomic-bomb survivors exposed to low doses of radiation in Nagasaki [29].

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Role of the *ret* oncogene activation in thyroid carcinoma

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Introduction

Following the Chernobyl nuclear catastrophe, a large amount of radioactive isotopes was released into the environment. Since then, many epidemiological studies have been performed and have demonstrated a steep increase in the prevalence of thyroid papillary carcinomas after an extremely short latency period, especially in children living in the contaminated area.

This result provided an important opportunity to analyze the correlation between carcinogenesis and radiation exposure at the molecular level.

Thyroid cancer is the most common form of solid neoplasm associated with radiation exposure. There are many studies which show the relation between the occurrence of thyroid tumors and irradiation, such as the study of therapeutic dose irradiation to the head and neck region, atomic bomb survivors and the survey of Marshall Islands inhabitants. Radioiodines are selectively trapped by thyroid epithelial cells causing the high radiation exposure to the thyroid gland. Absorbed doses are much higher in children than in adults.

To date there are several publications that reported a high frequency of *ret* activation in papillary thyroid carcinoma of children in the contaminated areas around Chernobyl, suggesting that *ret* activation could be related to radiation exposure [1—3].

I will review the role of the *ret* proto-oncogene activation and its importance.

The function of proto-oncogene

The accumulation of genetic damage in critical genes is the driving force in the transformation from a normal cell to a malignant cell. For example, the co-occurrence of both an activated proto-oncogene, such as ras, and the inactivation of a suppressor gene, such as p53, have been observed in the development of many types of human carcinoma, including those of the thyroid [4]. Thus, several critical genes for tumorigenesis are potential targets for carcinogens and radiation that can induce genetic damage at low doses. Proto-oncogenes are usually expressed during cell proliferation such as embryogenesis, the healing pathway of wounds and cell mitosis stimulated by growth factors. The proto-oncogenes encode for growth factors such as sis (PDGF), growth factor receptors with tyrosine kinase activity such as erb B (EGF receptor), nonreceptors with tyrosine kinase, regulatory proteins in signal transduction, and transcription factors such as N-myc in neuroblastoma (Table 1). The encoded proteins play a pivotal role in cellular growth and differentiation, as well as in apoptosis. Mechanisms that induce inappropriate functional activation of proto-oncogenes include point mutation, gene amplification or overexpression in the absence of gene amplification, chromosomal translocations and other gene rearrangements.

For an example of a point mutation causing proto-oncogene activation, ras can acquire transforming activity in its coding sequence. Activated ras has been detected in a relatively high percentage of colon and lung carcinomas. The ras gene products are 21,000-Da proteins (p21) which bind guanine nucleotides with high affinity and are thought to be involved in various signal transduction pathways. In thyroid carcinomas, activated ras oncogenes or overexpression of p21 ras protein has been described by several authors using different methodologies. A high rate of ras activation in thyroid carcinomas has been reported using NIH3T3 cell focus induction and mouse tumorigenicity assay, as well as by oligonucleotide-specific hybridization of polymerase chain reaction (PCR)-amplified DNA [5–7]. C-myc proto-oncogene has been observed in breast adenocarcinoma with the increased copy number.

Table 1. The function of proto-oncogenes.

Function	Proto-oncogene
Growth factor	sis(PDGF)
Growth factor receptor with tyrosine kinase activity	erb B(EGFR)
	fms(CSFR)
	met(HGFR)
	ret(GDNFR)
	trk(NGFR)
Tyrosine kinase	src
	abl
	lak
	yes
Regulatory protein in signal transduction	H-ras
	K-ras
	N-ras
	gsp
	gip
Nuclear regulatory protein	c-jun
	fos
	myc
	myb

The significance of gene rearrangements has been elucidated in several cases when the altered gene was identified as a proto-oncogene, like c-myc in Burkitt's lymphoma and *ret* in thyroid papillary carcinoma.

Structure and function of *ret* proto-oncogene

The ret proto-oncogene encodes a trans-membrane protein of the receptor type tyrosine kinase the ligand of which was identified recently, namely glial-cell-line-derived neurotrophic factor (GDNF). GDNF is a neurotrophic factor required for differentiation or survival of certain lineage of the mammalian nerve system and a distant member of the transforming growth factor (TGF)-β superfamily [8,9].

This tyrosine kinase receptor (TKR) consists of an extra-cellular domain and the cytoplasmic tyrosine kinase domain. *Ret* is expressed in cells derived from the neural crest and plays a critical role in the differentiation of the specific neural structure and the excretory system during early stages of embryogenesis.

As in the case of other receptors with tyrosine kinase activity, the *ret* proto-oncogene has an amino-terminal signal peptide (SP), a cadherin-like (CD) and cysteine-rich extracellular domain (CYS), a transmembrane domain (TM), and a cytoplasmic tyrosine kinase domain (TK) (Fig. 1). Alternative splicing in exon 20 leads to transcripts coding for either a "long" *ret* isoform, containing a 51 amino acid C-terminus, or a "short" *ret* isoform, containing a 9-residue C-terminus [10].

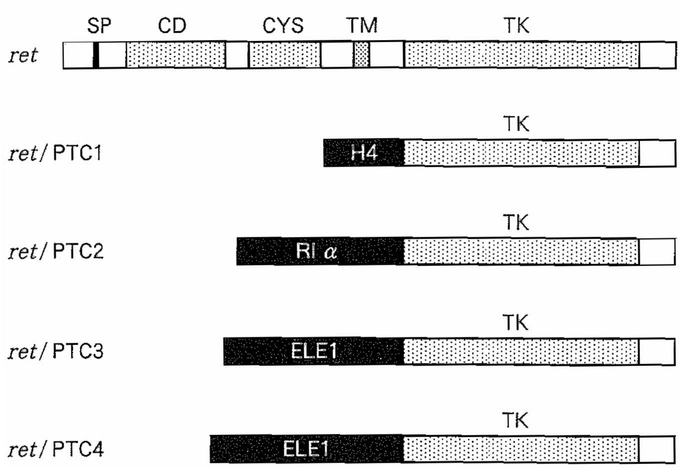

Fig. 1. Scheme of *ret* proto-oncogene and *ret*/PTC structures. The *ret* proto-oncogene structure encodes signal peptide (SP) at the amino-terminus, then cadherin-like (CD) and cystein-rich (CYS) extracellular domain, transmembrane (TM) domain and cytoplasmic thyrosine kinase (TK). Black areas mark the non-*ret* coding parts of the fusion proteins.

Ret activation in thyroid papillary carcinoma

The NIH/3T3 focus assay allowed the detection of a putative activated oncogene in thyroid papillary carcinomas [11] that was subsequently found to have resulted from a novel rearrangement of *ret* (*ret*/PTC). Four different forms of *ret* rearrangements (*ret*/PTC1, PTC2, PTC3 and PTC4) have been identified so far in thyroid papillary carcinomas [12–16]. *Ret*/PTC1 consists of the TK domain of *ret* fused to the 5′-terminal sequence of the gene H4, the function of which is still unknown. In the case of *ret*/PTC2 and *ret*/PTC3, the rearrangements involve the gene of the regulatory subunit RI-α of cAMP-dependent protein kinase (protein kinase A) and the amino-terminal of the ELE1 gene products, respectively. Recently a novel *ret* fusion protein with different oncogenic ELE1/*ret* rearrangement was reported [16]. It has 93 nucleotides larger than regular *ret*/PTC3 in the cDNA sequence and results from the fusion of ELE1 exon 5 with exon 11 in PTC4 instead of with exon 12, producing PTC3.

The *ret* gene is located on chromosome 10q11.2. Except for the RI-α gene, the other responsible genes for the *ret* activation, i.e., H4 and ELE1, have also been mapped on chromosome 10, 10q21 and 10q11.2, respectively. This means that *ret*/PTC1, PTC3 and PTC4 rearrangements are intrachromosomal events. Presumably two breakpoints occur, one in the *ret* locus and the other in the appropriate partner genes. Furthermore, the fusion points of the three forms of in vivo activated *ret* are all located in intron 11, between the transmembrane and the TK domain in *ret*. The sequence of these breakpoints in the *ret* oncogene has been analyzed [17]. Chromosomal rearrangements have previously been reported and contain breakpoints located close to Alu sequences in the m-brc rearrangements in CML [18] the tpr-met oncogene [19] and the ALL-1 gene rearrangement. Alu-homologous sequences are found in the H4 intron and ELE1 intron where the rearrangements occur, and in introns 12 and 13 of *ret*, just downstream of the site where the breakpoints occur. Besides the Alu sequence, the ELE1 intron contains a very AT-rich region (71% AT) at the 5′-end of the intron; the lower melting temperature of this intron sequence might contribute to the instability of this region [20]. A paracentric inversion of the long arm of chromosome 10 causes these intrachromosomal rearrangements. *Ret*/PTC2 arises from a reciprocal translocation (10:17)(q11.2:q23). As the activity of the c-*ret* promoter is limited to cells of neural crest origin [21], the aberrant expression of *ret*/PTC seems likely to be under control of the fusion gene promoter. In contrast to this, one group has reported that about 60% of *ret*/PTC3 cases express both the ELE1/*ret* as well as the *ret*/ELE1 [3]. This implies that in these cases not only the ELE1 promoter was active but also that the c-*ret* promoter might have been reactivated, possibly by radiation exposure.

The *ret*/PTC results in unscheduled expression in thyroid follicular cells of *ret* tyrosine kinase activity through the activity of the promoters of the 5′ chimeric partners in the rearrangement. The loss of the ligand binding and the transmembrane domains leads to a change in the cellular localization of *ret*. The *ret* tyrosine kinase is constitutively activated, presumably due to constitutive oligomerization of the oncogene [22]. *Ret*/PTC has been demonstrated to be associated with GRB2-SHC complexes [23], and to induce endogenous ras activity through EGF stimulation of an epidermal growth factor receptor/*ret* kinase chimera [24]. Mitogenic activity of *ret*/PTC2 requires dimerization. The N-terminus of the regulatory subunit RI-α of cAMP-dependent protein kinase domain and 586-Tyr in the *ret* kinase core are believed to be responsible for dimerization [25]. Also, 539-Tyr is an essential docking site for the full transforming potential of the oncogene [26]. Only the RI dimerization domain is required for mitogenic activity of *ret*/PTC2. However, two tyrosines outside the kinase core were also identified as essential for full mitogenic activity of *ret*/PTC2. Tyr-350 and Tyr-586 are potential sites for the Src homology 2 and phosphotyrosine binding domain [25]. However, the pathway of *ret* activation to couple with transforming pathways in thyroid cells is still unknown.

Ret rearrangements appear to be restricted to thyroid carcinomas, and specifically to the papillary subtype. Targeted overexpression of *ret*/PTC1 in the thyroid glands of transgenic mice induces thyroid neoplasms of the papillary subtype [27,28]. Normal human thyroid epithelium studies [29] show that the papillary phenotype is associated with *ret* activation, whereas ras oncogene mutations occur at a high frequency in follicular tumors. This phenomenon is unique to the thyroid. Tumors of thyroid follicular epithelial origin are useful study models for the progressive pathway of tumorigenesis: two distinct pathways have been proposed, i.e., to papillary tumors related to *ret* oncogene and to follicular tumors related to ras oncogene arising from the same cell. These suggest that the different pathological and clinical behavior of these two tumor types results from the type of activated oncogene at the first step of tumorigenesis. Also there is a report that *ret* rearrangement is seen at a high frequency (50%) in occult cancer, intimating that *ret* activation is an early event in thyroid carcinoma [30]. Another study with a rat thyroid epithelial cell line shows that cells transfected with *ret*/PTC lose the typical markers of thyroid differentiation, such as expression of thyroglobulin, thyrotropin-receptor and thyroperoxidase genes, the ability to trap iodine and the proliferation dependency on TSH. A transformed phenotype of these cells was obtained by cooperation between *ret* and either the viral H-ras or K-ras oncogene. With only the presence of ras, these cells get the malignant phenotype [31]. In agreement with the multistep theory of carcinogenesis, coactivation of oncogenes is highly possible, although there are few in vivo reports of coactivated oncogenes in thyroid carcinomas.

The frequency of *ret* rearrangements in papillary thyroid carcinoma differs according to the geographical area (Table 2). The frequency is high (ca. 60%) in papillary thyroid cancers derived from children living in Belarus, and low (2.5%) in Saudi Arabia [3]. This difference may be due to genetic and/or environmental factors such as iodine, exposure to radiation or merely due to differences in the techniques used to detect the rearrangements. There are several publications that show high frequencies of *ret* rearrangements after the Chernobyl acci-

Table 2. The *ret*/PTC activation in papillary thyroid carcinomas.

Country	Reference		*ret*/PTC	
Italy	Bongarzone	1994	35%	(18/52)
		1993	33%	(14/42)
	Santoro	1993	33%	(10/30)
USA	Jhiang	1994	17%	(11/65)
		1994	17%	(6/36)
		1992	11%	(4/36)
France	Jhiang	1994	11%	(8/70)
Japan	Wajjwalku	1992	3%	(1/38)
	Ishizaka	1991	9%	(1/11)
Belarus	Klugbauer	1995	66%	(8/12)
	Fugazzola	1995	67%	(4/6)

dent [1—3], especially in *ret*/PTC3; *ret*/PTC3 is 3 times more common in post-Chernobyl than *ret*/PTC1. Nothing is yet known about H4 and ELE1 functions or whether they differ in expression during childhood and adolescence. Recently one group reported that *ret* activation might be related to age and suggested that age could contribute to the thyroid-specific carcinogenic process [32]. They found five cases with *ret*/PTC out of nine ranging from 4 to 19 years of age (56%), a frequency that was almost twice as high as that in adults. Another survey showed that the highest number of patients developing thyroid carcinomas was in the group less than 1 year of age at the time of Chernobyl, and this number decreased progressively through to the age of 12 years old. On the other hand, none of the patients with benign lesions was less than 2 years old at the time of the accident [33]. The functional status of the thyroid gland in children could make their thyrocytes a more sensitive target for exposure to DNA-damaging agents, such as ionizing radiation. Besides this, the iodine uptake in children is also higher than adults. It is noteworthy that after irradiation with 50 Gy or more, *ret* oncogenic activation was induced in clonal thyroid carcinoma cells [34]. Papillary carcinoma represents the prevailing histological type of child thyroid cancer after Chernobyl despite a relatively low-iodine diet. A higher prevalence of *ret* rearrangement in a few cases of adult thyroid carcinoma with metastasis compared to cases without metastasis has been demonstrated [35]. To date, in the study of children exposed after Chernobyl, most of the children with papillary thyroid carcinomas have lymph-node metastases [36], and show *ret*/PTC rearrangement at a high frequency. Taken together, among the variety of possible radiation-induced genomic events in the thyroid-exposed children in Chernobyl, it is highly possible the *ret*/PTC3 rearrangement affects thyroid cells most effectively into tumor development. However, a definitive conclusion on a direct cause-effect relationship between nuclear irradiation and *ret* activation cannot yet be derived from these studies. In fact there is a lack of appropriate controls. A more delicate study has to be done to elucidate this issue.

The role of *ret* in other diseases

Since the c-*ret* oncogene is a member of the tyrosine kinase gene superfamily, it plays a critical role in transducing signals involved in cell growth and differentiation. Somatic mutations of c-*ret* are responsible for thyroid papillary carcinoma, while germline mutations are responsible for medullary thyroid carcinoma (MTC), which is a tumor of neuroectodermal origin. MTC may arise as a sporadic tumor or as a component of one of three autosomal dominant familial cancer syndromes: MEN2A, MEN2B or familial MTC (FMTC). To date, germline mutations of the *ret* proto-oncogene in MEN2A, MEN2B and FMTC, and sporadic mutations in some sporadic MTC have been identified. Missense mutations of the sequence coding for one of five cysteines in exon 10 or 11, within the extracellular domains of *ret*, has been observed in MEN2A and FMTC at a high frequency [37—40]. This mutation leads to disulfide-linked homodimerizatin of the *ret* protein on the cell surface, which causes the activation of its intrinsic tyrosine kinase. Mutation in exon 16, within the TK domain, has been observed in MEN2B [40,41]. This causes activation of *ret* tyrosine kinase without the formation of its covalent homedimerization. These differences in the mechanism of *ret* activation may account for the different phenotype between MEN2A and MEN2B. Mutations in exon 16, exon 10 and exon 11 have been found in some but not all sporadic MTC [41—43]. Studies of tumor tissues from MTC patients have failed to show a loss of heterozygosity (LOH) for the *ret* proto-oncogene. This suggests that the *ret* oncogene in MTC functions as an oncogene rather than a tumor suppressor gene [44—47]. LOH studies found allelic losses on chromosome arms 1p, 3q, 13q and 22q in hereditary and sporadic MTC [39,46,47]. These show that development of these tumors may be the result of the multiple genetic events, as has been described in colonic carcinomas [48]. In addition to its role in tumor formation, c-*ret* is thought to have a development role since mutations of the gene have been implicated in the etiology of Hirschsprung's disease (congenital megacolon), because it functions during the development of the enteric nervous system in mammals. Hirschsprung's disease occurs at a rate of approximately 1 in 6,000 live births and is characterized by a lack of parasympathetic innervation of the lower intestine. Occurrence of this disease corresponds to the c-*ret* gene, deletion and nonsense mutations leading to truncation of the expressed protein. Also, three mutations resulting in single amino acid substitution in the kinase region of the c-*ret* gene have been reported [49,50]. Another report of Hirschsprung's disease patients shows that one mutation in the intracytoplasmic region of *ret* leads to impaired tyrosine kinase activity, while two mutations in the cytoplasmic domain lead to inhibited *ret* biological activity because of impairing the correct maturation of *ret* protein and its transport to the cell surface [51]. Thus a variety of inactivating mutations of the *ret* proto-oncogene, which result in defective protein formation, are causative for Hirschsprung's disease.

Conclusion

Unfortunately it is a fact that quite a few papillary thyroid carcinoma cases have been observed after Chernobyl. At the molecular level, *ret*/PTC rearrangement has been found frequently among these patients, especially children. As *ret*-rearrangement is considered to be related to irradiation, the thyroid epithelium seems to be particularly sensitive to the transforming action of ionizing radiation. The *ret*-oncogene is possibly related to this phenomenon.

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Chernobyl and Japan

Chernobyl: A Decade
S. Yamashita and Y. Shibata, editors.

Opening words

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It has been 10.5 years since the most serious accident in the history of nuclear power generation occurred at the Chernobyl Nuclear Power Plant in the former Soviet Union.

Only several years after the accident did activities to help the victims gradually spread across the borders, although accurate information was not yet available.

Sasakawa Memorial Health Foundation has offered assistance to the Chernobyl victims over the past 5 years in the form of health screening of persons exposed to the accidental radioactive release, particularly children who were 10 years old or younger at the time of the accident.

Our foundation was established 20 years ago to realize the ideals of Mr Ryoichi Sasakawa, which were introduced by Mr Yohei Sasakawa in his address in the field of leprosy control and other health problems. As part of its activities, the foundation collaborated closely with the World Health Organization (WHO) for more than two decades in the area of international health and medical cooperation, particularly in efforts to eradicate smallpox and Hansen's disease, and then AIDS. The foundation suffered a great loss in recent years with the passing away of Mr Ryoichi Sasakawa, former chairman of the Nippon Foundation, and Prof Morizo Ishidate, former chairman of the board of our foundation, both of whom had seen the start of the Chernobyl Sasakawa Health and Medical Cooperation Project. However, their wishes and aspirations have been succeeded by Mr Yohei Sasakawa, president of the Nippon Foundation, and I succeeded Prof Ishidate and have been working vigorously for these international health-related activities as chairman of the board.

The foundation carried out humanitarian activities based on scientific studies for the victims of the Chernobyl accident, i.e., efforts to examine the health conditions of the children who will bear the next generation. The results of the health screening of 160,000 children conducted at the five Chernobyl Sasakawa project centers (Kiev, Korosten of Ukraine, Mogilev and Gomel of Belarus, and Klincy of Russia) were reported on the first day of this symposium.

Dr Itsuzo Shigematsu, chairman of the Radiation Effects Research Foundation, has been engaged for many years in research in the field of epidemiology and nuclear medicine, particularly in Hiroshima and Nagasaki, the two cities where atomic bombs were dropped 50 years ago for the first time in the world. He and many of his colleagues in Japan have worked together with experts and medical personnel at the five centers to examine the health of children, assuring those who are healthy and providing a reliable diagnosis at an early stage for those in whom abnormal findings were found. We are happy to know that the people at the centers are continuing the examinations, establishing diagnoses and conducting independent investigations using state-of-the-art diagnostic devices sent from Japan and techniques learned from the Japanese staff.

Some of the results obtained by this project were presented at an international conference entitled "One Decade after Chernobyl: Summing up the Consequences of the Accident" held in Vienna from April 8–12, 1996, jointly sponsored by the EU, IAEA and WHO.

We have not yet drawn any definite conclusion from the data obtained from the medical screening at the five centers, but we believe that the ongoing follow-up studies will further contribute to the health of the victims, particularly children.

I believe that many people look forward to our continuing cooperation. On this second day of the fifth symposium, the representatives of WHO and MRRC/RAMS will be presenting data and discussions which are essential for further cooperation between local and Japanese researchers on the follow-up studies.

After my address, Dr Shigematsu will discuss Japan's recent medical views on the effects of radioactivity on health.

In opening this session, as chairman of the board of Sasakawa Memorial Health Foundation, I wish to express my heartfelt thanks to the experts who participated in our project and to those who helped to implement the project. May I add that I am very happy that Mr Sasakawa, president of the Nippon Foundation which provided funding for this project, was able to visit Kiev on this occasion. Thank you.

Chernobyl: A Decade
S. Yamashita and Y. Shibata, editors.

Radiation health effects research in Japan

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Introduction

People in Hiroshima and Nagasaki, without distinction of age or sex, experienced for the first time in human history exposure to massive doses of instantaneous ionizing radiation which was produced by the detonation of atomic bombs in 1945. Such tragedies should never be repeated, but it is true that these unfortunate experiences have greatly enhanced our knowledge of the health effects due to exposure to ionizing radiation.

At present, besides these episodes, a number of data from various sources are available for health risk estimation of human populations exposed to radiation. These data are derived from, for example, nuclear weapons tests, nuclear accidents, medical therapy and diagnosis, and occupational hazards, but as far as the long-term health effects are concerned, information from Hiroshima and Nagasaki still remains the most important throughout the world. It should be emphasized that, although there are many other episodes of radiation exposure, these data cannot be used for estimation of health risks unless the denominator populations are well defined by radiation exposure doses.

Research studies at ABCC-RERF

The Atomic Bomb Casualty Commission (ABCC) was established in Hiroshima in 1947 and in Nagasaki in 1948 by the US National Academy of Sciences (NAS) based on President Truman's directive to initiate a long-term and comprehensive epidemiological and genetic study of the atomic bomb survivors. The Japanese National Institute of Health under the Ministry of Health and Welfare joined the ABCC 1 year later to assist in the studies and improve the cooperation of the survivors.

This arrangement continued for 28 years until it was replaced in 1975 by the Radiation Effects Research Foundation (RERF), a nonprofit Japanese foundation binationally managed and supported with equal funding by the governments of Japan, through the Ministry of Health and Welfare, and the USA, through the NAS under contract with the US Department of Energy. Thanks to the cooperation of the survivors and the contributions of a multitude of scientists, these studies flourish to this day in what must be the most successful long-term research collaboration between Japan and the USA.

During the period when Japan was occupied by the Allied Forces, there were many restrictions for Japanese researchers in conducting studies on atomic bomb survivors, but after the Peace Treaty became effective in 1952, these restrictions were removed, and active programs began in various institutions, including local universities in Hiroshima and Nagasaki. The results of these studies have been summarized annually since 1959 at the meetings of the Late A-Bomb Effects Research Society. Today, I will mainly talk about research studies at ABCC-RERF.

The current research program began as a series of platform protocols based on a fixed cohort of 120,000 survivors who were listed in the Japanese National Census of 1950. The Life Span Study (LSS) follows this entire cohort by means of national death-certificate retrieval system. The Adult Health Study (AHS) follows a subsample of 20,000 survivors using biennial health examinations.

Recently, the mortality studies have been enhanced by cancer incidence studies using the RERF-developed tumor registries in Hiroshima and Nagasaki. Finally, a cohort of several thousand individuals who were in utero at the time of the bombings is also being followed.

Since the ABCC/RERF fixed cohorts do not include persons who died between the time of the bombings and 1950, the results may reflect a resistant subpopulation of survivors who are not representative of overall human risk. However, study after study has failed to show any difference in the radiation sensitivity of the survivors' cells as a function of the survivors' radiation dose.

The central finding of the mortality and cancer incidence studies is a strikingly linear, nonthreshold increase in cancer risk with radiation dose. At 1 Sv, the relative risk is approximately 1.6, occurring in essentially all tissues and including benign and malignant diseases. Some evidence points to an even greater risk in the very young, but cumulative mortality of the survivors who were younger than 30 years old at the time of the bombings is only 14% at this time. We estimate that it will be another 20 years before the question of age sensitivity can be addressed properly, making this one of the primary reasons for continuation of the studies into the future. Beyond cancer risk, a significant, but small and not well-defined excess mortality from heart, vascular, liver and lung disease is also associated with increased radiation dose.

The AHS physical and laboratory examinations provide valuable insight into emerging and nonfatal effects of radiation as well as a source of important biological samples for biodosimetry and related activities. Recent clinical findings include the evidence for thyroid, parathyroid, and menstrual malfunction and the subtle and still unexplained changes that occur in calcium metabolism as a function of radiation dose. The AHS control data have shown a great deal about aging and other changes over time in the Japanese population. All of this is made possible by the high, greater than 80%, participation rates in this program.

The RERF genetics investigators have searched vigorously for heritable effects of radiation in the offspring of the survivors. To date, not a single one of the many endpoints has shown a significant effect. The data suggest that humans are not unusually sensitive to the genetic effects of radiation. An active effort is underway to verify this presumption through the use of new technologies such as a direct examination of DNA for mutational differences between survivors and their children.

Because of the enhanced effects of radiation on the evolving tissues of the embryo, the in utero population is especially vulnerable to health effects. The central nervous system is a major target in early embryogenesis, as evidenced by the reduction of head size and intelligence in those irradiated early in pregnancy. Cancer mortality is increased in the in utero population, but is indistinguishable from the comparable effect in those who were 9 years of age or younger at the time of exposure.

International collaboration and future studies

Although RERF studies are necessarily limited to the effects of acute, whole-body, mixed γ-neutron radiation from the atomic bombs, their comprehensiveness and duration make them the most definitive descriptions of the late effects of radiation in humans. For this reason, the entire world relies heavily on RERF data to set radiation standards, as demonstrated in the reports of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), the International Atomic Energy Agency (IAEA), and the Committee on Biological Effects of Ionizing Radiation (BEIR).

RERF has recently been promoting cooperative studies with the research institutes involved in the Chernobyl and South Urals episodes to exchange information of our experience with that of other exposure experiences. The collaborative study subjects are, for example, examinations of chromosomal aberrations and somatic cell mutations and molecular analysis for various cancer suppressor genes.

As mentioned earlier, epidemiological methods for assessing the health risks of radiation exposure identify a numerator of those with health abnormalities among a denominator population defined by exposure dose. In Hiroshima and Nagasaki, the identification of the denominator was delayed because of the confusion after the war, but a greater delay has occurred in Chernobyl and, so far, only the numerator has been emphasized. This is regrettable, and every effort should be made to provide appropriate denominators as soon as possible.

Because of the accelerated aging of atomic bomb survivors, it is becoming more and more difficult to identify the effects of radiation from those of other factors, and health effects that are still unknown may appear with aging phenomena. On the other hand, those exposed at younger ages are just now reaching the cancer-prone ages. Furthermore, about 50% of the survivors are alive as of the present time. By age at the time of the bombings, 86% of those less than 30 years of age and 92% of those less than 10 years of age are still alive. Therefore, it is important to continue careful observations for these survivors.

We should not be satisfied with the results obtained so far about genetic effects, and should pursue the issue with more precise techniques, such as DNA analysis. In the studies of the late health effects of atomic bomb survivors, it is important to clarify not only positive findings showing the presence of abnormalities but also negative findings indicating the absence of abnormalities.

Following the Chernobyl accident in April 1986, many groups and organizations in Japan have extended medical cooperation in various forms to the former Soviet Union and international organizations. The Chernobyl cooperation project which has been conducted by the Sasakawa Memorial Health Foundation with a budget of US$50 million over a 5-year period from 1991 seems to be a voluntary activity of the largest scale not only in Japan but also in the world. The Japanese government provided US$20 million to the World Health Organization (WHO) in 1991, the purpose of which was to contribute to the promotion of the WHO International Programme on the Health Effects of the Chernobyl Accident (IPHECA) for the mitigation of health consequences among the affected people.

Such cooperation has been extended not only to the Chernobyl accident but also to other radiation-exposed areas such as South Urals, Semipalatinsk, Goiania in Brazil, etc. The Hiroshima International Council for Health Care of the Radiation-Exposed (HICARE) and Nagasaki Association for Hibakusha's Medical Care (NASHIM) were established in 1991 and 1992, respectively, by the sponsorship of the local governments to share with others on a global scale expertise that has been accumulated in Hiroshima and Nagasaki and also to conduct cooperative studies with scientists in these areas.

Concluding remarks

The pattern of radiation exposure in Hiroshima and Nagasaki is characterized by a single instantaneous exposure to massive doses of radiation, while these episodes mentioned above are caused by continuous exposure to low doses of radiation. An exchange of information acquired from such a unique experience with that of other exposure experiences would contribute greatly to the world. I therefore appreciate your support for expanding these collaborations.

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WHO contribution to the medical follow-up of the Chernobyl accident

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Major completed Chernobyl activities of WHO

In June 1989 WHO was the first international organization to send a team of experts to the USSR after the Chernobyl accident, followed by a complementary mission of the League of Red Cross and Red Crescent Societies in early 1990. During its first mission WHO concluded that psychological factors affecting health needed special attention and that screening of the population could be improved.

WHO also took part in the International Chernobyl Project [1] which was completed in 1991.

In May 1991 the World Health Assembly, in Resolution WHA44.36, officially endorsed the establishment of the International Programme on the Health Effects of the Chernobyl Accident (IPHECA) under the auspices of WHO as a cooperative effort of the three affected countries, WHO, including the Regional Office for Europe, and a number of other countries and organizations. Initial funding of US$20 million was provided by Japan and supplemented by Finland, Switzerland and the Czech and Slovak Republics.

The program started in April 1992 and the pilot phase came to an end in 1994. Its broad aim was to support efforts to relieve the health consequences of the accident by assisting the health authorities in the affected countries through provision of equipment, training and expert advice and exchange of information. IPHECA's other objectives are to consolidate experience gained from treatment of radiation exposure.

The IPHECA pilot phase made a good contribution to the following:

1. Improvement of medical monitoring of the affected population for early diagnosis and treatment of radiation-related diseases.
2. Establishment of national Chernobyl registries designed for large-scale epidemiological studies in order to provide decision makers with relevant information needed for planning of medical care systems in contaminated territories.
3. Initiation of long-term investigations of the accident health effects.

Concurrently, with the conclusion of the Pilot Phase of IPHECA [2], WHO organized a major scientific conference on health consequences of the Chernobyl and other radiological accidents in Geneva in November 1995 [3] with the following scope:

Accidents and events	Size
Chernobyl	480 participants
Hiroshima and Nagasaki	40 countries
Altai area, Techa River, Chelyabinsk	five international organizations
Goiania, Brazil	118 papers
Shanghai accidental exposure	30 poster presentations
Indian accidental exposure	4 days' duration

As Dr Hiroshi Nakajima, Director-General of WHO, mentioned in his opening speech to the conference: "This is the first of three international conferences related to Chernobyl, and the only one devoted exclusively to health effects. It will help us to understand better the type, magnitude and severity of observed health effects of the Chernobyl accident and to be prepared for their future evolution."

It achieved these objectives by presenting and comparing a wide range of scientific findings. Two sessions and one panel with a total of 18 scientific presentations and many additional posters were exclusively devoted to thyroid diseases.

A major conclusion, joining the experience of EC, IAEA and WHO was reached at the Joint International Conference, One Decade after Chernobyl, held in Vienna, April 1996.

Accident initial fatalities and injuries

The explosion on April 26, 1986 and early release of radionuclides resulted in 30 deaths, including 28 deaths attributed to acute radiation sickness. These fatalities occurred among the 134 plant staff, firefighters and emergency workers. Since then, over the past decade, while 14 additional patients have died, only some of these might be attributable to radiation exposure.

Incidence of thyroid cancer

There has been a substantial increase in reported cases of thyroid cancer in Belarus, Ukraine, and some parts of Russia, especially in young children, generally attributed to exposure to radioiodine during the early phases of the accident in 1986. To date, three children have died from thyroid cancer.

Long-term radiation health effects

Apart from an increase in thyroid cancer, there has been no statistically significant deviation in the incidence rates of other cancers that can be attributed to radiation exposure due to the accident.

Other health-related factors

Many changes in health have been seen in the exposed population that are not the result of direct radiation exposure. There are significant health disorders and symptoms, such as anxiety, depression, and various psychosomatic disorders attributable to mental stress among the population of the region.

Prediction of further health consequences

To understand the current incidence of health consequences and predict its development in the future, predictive models are essential [4,5].

The primary epidemiological data used for such exercises are those from the long-term follow-up of the Japanese atomic bomb survivors (Life Span Study, LSS) who were exposed to acute doses of mostly γ radiation. Although there are a number of epidemiological studies from which radiation risk data can be obtained, the atomic bomb studies continue to be the main source of data for risk estimation. In the LSS, the solid cancer risk appeared gradually, starting 5–10 years after exposure and increased roughly in proportion to the background cancer rates that increased with advancing age (with passage of time). Excess relative risk for solid cancers has been remarkably constant during the follow-up, except for those exposed as children. Generally, however, age- and sex-dependent relative risk are constant over time and seem to adequately describe the solid cancer risk [6]. A recent pooled analysis of seven studies also suggests excess relative risk among those exposed at ages < 15 years to continue to be elevated for many years, declining 30 years after exposure [7].

In extrapolating the risk estimates based on high doses and high dose-rate exposure to low dose and low dose-rate exposures, the ICRP used the reduction factor (dose and dose-rate effectiveness factor (DDREF)) of 2 [8]. In estimating the expected health effects in the various exposed populations as a result of the Chernobyl accident, the atomic bomb data were applied assuming no dose and dose-rate effectiveness, i.e., DDREF being 1. Nor was there any dose effectiveness assumed for internal exposure to various radionuclides. Therefore, risk estimates and prediction of the Chernobyl health consequences in the future are considered as preliminary. Nevertheless, results of such estimations serve as tentative for planning of health care in affected territories. Thus, based on predictive models, it is estimated that the number of future deaths from leukemia will be of the order of 470 among the 7.1 million residents of the contaminated territories and 200 among the 200,000 liquidators who worked at Chernobyl between 1986 and 1987. Some additional predictive results for children and adults are shown in Tables 1 and 2.

However, there are many uncertainties in the field of prediction of the Chernobyl accident radiation-related health effects. The most important ones for predictions by risk models are: choice of risk model; transfer of data between populations with different background rates; projection of risk over time; extrapolation

Table 1. Projected cases of thyroid cancer in children aged 0—14 years at the time of the accident.

Population	Size/ Mean dose	Background incidence	Expected number of thyroid cases					
			Lifetime		First 10 years			Total observed through 1993
			Background	Excess	Background	Excess	Total expected	
Brest	377000	Belarus	452	132	6	<1	6	55
Oblast	30 mSv	US White	1300	380	18	1	20	
Gomel	403000	Belarus	483	1495	6	5	11	135
Oblast	290 mSv	US White	1400	4300	20	17	36	
Minsk	399000	Belarus	478	104	6	<1	6	12
Oblast	20 mSv	US White	1400	300	20	1	20	
All Belarus	2140000	Belarus	2558	2157	31	7	39	234
Oblasts	80 mSv	US White	7400	6200	105	24	128	
Bryansk	92000	Belarus	110	421	1	1	3	13
Oblast	35 mSv	US White	300	1200	5	5	10	

Note: 1) 5-year latency is assumed. 2) Background Belarus thyroid cancer incidence rates for 1983—1987. 3) Background US White thyroid cancer incidence rates for 1983—1987.

to low dose and dose-rate; external/internal radiation, and residual LSS uncertainties.

Current IPHECA projects

In the interest of making improved assessments of the risk to human health from nuclear accidents, it is essential to continue and further develop activities in the follow-up of the Chernobyl accident. From the pragmatic, scientific and moral points of view, failure in exploiting the unique opportunity of increasing our knowledge of the long-term effects of radiation contamination and clarifying the uncertainties in the field of health effects prediction of low doses of radiation would be intolerable.

Based on the results of IPHECA pilot projects and other relevant national and international program, WHO, in collaboration with the three affected states, iden-

Table 2. Projected cases of solid cancers and leukemia: lifetime (through 95 years) and first 10 years after the accident.

Population	Size/ Mean dose	Type of cancer		Predicted number (%)	
				Background	Excess
Liquidators	200000	Solid cancers	Lifetime	41500 (21%)	2000 (1%)
1986—1987	100 mSv	Leukemia	Lifetime	800 (0.4%)	200 (0.1%)
			First 10 years	40 (0.02%)	150 (0.08%)
Evacuees from	135000	Solid cancers	Lifetime	21500 (16%)	150 (0.1%)
30 km zone	10 mSv	Leukemia	Lifetime	500 (0.3%)	10 (0.01%)
			First 10 years	65 (0.05%)	5 (0.004%)

tified priority areas for further development of the program. Its implementation would help to overcome the uncertainties in health effects of low doses of radiation and radiation risk assessment.

The priority areas include the following:

1. In-depth investigation of a cause of outbreak of thyroid cancer after the Chernobyl accident.
2. Long-term monitoring of accident recovery workers in order to obtain data on the health effects of low doses of radiation.
3. Reconstruction of collective and individual doses in order to support radiation risk assessment investigations.

The activities are carried out within the framework of the current IPHECA projects presented below.

International thyroid project (ITP)

This project has replaced the thyroid pilot project and is coordinated by WHO/EURO. Within the ITP, a number of public health priorities have been identified and a WHO collaborating center designated to coordinate local activities with an assistance and collaboration network of seven international centers of excellence in the appropriate disciplines, also designated as WHO collaborating centers. The objectives of the project are to:

1. Build capacity to screen, diagnose and treat thyroid disorders as appropriate.
2. Monitor the progress of the outbreak of thyroid cancer and direct resources appropriately.
3. Facilitate collaborative research to determine the origin of the outbreak of thyroid cancer and identify those most at risk.

These should be seen as purely public health-oriented objectives and thus of great practical importance to the country and those affected. The activities range from strengthening the infrastructure in Belarus to cope with the public health needs through developing kits for thyroid hormone assays, to a case control study to elucidate the effects of various potentially modifying factors on risk and to establish an international tissue bank for the development of early diagnostic methods and research purposes. Although quite extensive in their nature these activities only address a part of the problem. Plans are in hand to extend the project to meet the needs of other countries that were affected.

In partnership with the three most affected countries WHO will act as:

1. Coordinator of activities related to the diagnosis and treatment of thyroid disease, the acquisition of data and samples relevant to research on thyroid disorders.
2. Facilitator of humanitarian and public health measures and activities aimed at mitigating the effects of increased thyroid disease burden.
3. Facilitator of research aimed at understanding the origin and likely extent of the increased thyroid disease through a network of international centers of excellence.

These aims and objectives will be achieved through the maintenance of a project office in Minsk staffed by an endocrinologist, support for the WHO collaborating center coordinating local activities in Minsk and the coordination of an international network of collaborating centers covering the disciplines involved.

Accident recovery workers project

Accident recovery workers (otherwise known as "clean-up workers" or "liquidators") represent a particular group exposed to varying degrees above the levels applicable to the general population through specific activities they undertook to minimize exposure to radiation from the accident of the general population.

The aim of the project is to investigate and mitigate the health effects of the accident recovery workers. The primary purpose of the IPHECA project should be humanitarian in nature focusing on the strengthening and coordination of ongoing efforts by Belarus, the Russian Federation and Ukraine to provide diagnoses, treatment and rehabilitation of the accident recovery workers and their families.

The secondary purpose would be to lay the foundation for research on health effects by establishing facilities for systematic acquisition and exploitation of necessary data from the health care program and outside sources.

In order to coordinate activities within the "Accident Recovery Workers" project, WHO has established a WHO collaborating center at the Centre of Ecological Medicine (St. Petersburg, Russian Federation). It is also envisaged to establish a project expert advisory committee which will include representatives of donors, participating institutions, Ministries of Health and Ministries of Emergency Situations.

Following the recommendations of the international consultation in St. Petersburg, June 27—July 1, 1994, a draft of the project protocol was developed and discussed by participants of a WHO Working Group Meeting held in St. Petersburg, December 1995.

The protocol consists of epidemiological and clinical parts. 125,000 liquidators will be under epidemiological monitoring in order to establish a project database. This will include epidemiological information on morbidity, mortality and disability of liquidators. The clinical part of the protocol is dealing with detailed clinical examination of about 5,000 liquidators in order to obtain data on specific clinical signs, symptoms, possible biomarkers of radiation, indicators for biodosimetry, and effectiveness of different therapeutic and rehabilitation methods. In addition, the project protocol includes information to collect data on the health status of liquidators' children.

In parallel with the development of a common project protocol, efforts have been undertaken to prepare a special program within the project for in-depth investigation of oxidative stress in accident recovery workers. The expert meeting on this project was held in Paris in September 1996 in order to finalize the description of the program.

This program includes the following three stages:

1. Overview of results obtained in the three states and methods used for identification of oxidative stress markers and antioxidant therapy.
2. Development of standardized protocols and implementation of similar laboratory methods and clinical approaches for the study of oxidative stress biomarkers in liquidators.
3. Clinical trials in order to study the clinical effects of antioxidant therapy and identify more effective antioxidants.

Dose-reconstruction project

The overall aim of the dose-reconstruction project is to recommend a common approach and appropriate technology for the reconstruction of individual and/or group external and internal doses so that a series of compatible databases can be created that will provide suitable input for epidemiologic studies of radiation risk resulting from the Chernobyl accident.

Specific objectives are as follows:

1. Review available dosimetric data in existing databases and assess the quality of such data.
2. Recommend appropriate and efficient dosimetric methodologies for retrospective assessments of exposure.
3. Provide a common format for dosimetric databases and methodologies that may be used to validate primary data.
4. Develop techniques for the reconstruction of individual external and internal doses, including the specification of uncertainty.
5. Reconstruct individual doses for persons with thyroid cancer, leukemia, and other diseases of interest to epidemiologic studies.
6. Identify the important gaps in dosimetric knowledge related to the Chernobyl accident.

The Dose-Reconstruction Project includes the territories and selected cohorts stipulated by the IPHECA projects.

The included territories in the three affected countries are characterized by a level of ^{137}Cs-deposition density of > 555 kBq/m^2 (> 15 Ci/km^2) and also other territories according to the objectives of the project. Of interest are the following oblasts:

Belarus	—	Gomel and Mogilev oblasts
Russian Federation	—	Bryansk and Kaluga oblasts
Ukraine	—	Kiev and Zhitomir oblasts

The study population of these territories is about 270,000.

In addition, the Dose-Reconstruction Project includes those specific territories and cohorts for which direct dose measurements have been obtained. This data will be used for extrapolation and validation purposes.

Dose reconstruction could also be performed for thyroid cancer or leukemia cases developed in residents of territories not before included in IPHECA projects upon the adoption of recommendations during the course of the project.

It should be taken into consideration that due to a restricted IPHECA budget, the Management Committee allocated only "seed money" for the promotion of the IPHECA postpilot phase project. Further development of its activities is totally dependent on additional extrabudgetary resources.

Conclusion

IPHECA provided a good contribution to the improvement of medical monitoring for the residents of contaminated territories in Belarus, the Russian Federation and the Ukraine. The scientific results of the program enriched the scientific knowledge on health effects of the Chernobyl accident and provided additional information for the planning and development of further investigations.

The Forty-Ninth World Health Assembly held in Geneva, May 1996, noted with appreciation the work already being done by WHO and other international organizations to monitor and mitigate the adverse effects of the Chernobyl accident, and the support being given by member states.

In the Resolution WHA 49.22 adopted by the assembly, the following statements were outlined.

"The Forty-Ninth World Health Assembly...":

1. URGES Member States to participate actively in and to provide further support for the implementation of the International Programme to mitigate the Health Effects of the Chernobyl Accident.
2. REQUESTS the Director-General:
   i. To continue the implementation of the International Programme, in particular to build on the foundation of the pilot projects in the further development, validation and strengthening of methods, instruments and expertise.
   ii. To give emphasis to the monitoring and mitigation of long-term health effects in highly exposed groups, including accident recovery workers and children and other residents of areas heavily contaminated with radioactive materials.
   iii. To seek to mitigate other significant health effects that are not radiation induced but are attributable to the accident, including psychological and psychosomatic effects.
   iv. To continue close collaboration with other competent international organizations, including organizations of the United Nations system, in the further development and implementation of the International Programme.

Following the WHA resolutions, WHO undertakes efforts to mobilize extrabudgetary resources.

WHO will also pay more attention to the strengthening of international cooperation in the field of medical follow-up of the Chernobyl accident. The exchange of experience between governmental and nongovernmental organizations is especially important. For example, WHO considers the methodology used within the Chernobyl Sasakawa Project for the standardization of all stages of collaborating investigations in participating centers, from the collection to analyzing and presentation of the data, extremely useful. This experience will be taken into account for further IPHECA development.

WHO proposes to continue and further develop its activities in the follow-up of the Chernobyl accident, integrating the activities and expertise of its different offices and specialized agencies.

The WHO Chernobyl Project proposes to continue and expand the role of IPHECA as an "umbrella" under which WHO encourages, facilitates and coordinates, in collaboration with the three affected countries, activities by other organizations aimed at addressing the public health impact of the Chernobyl accident through the facilitation of aid, assistance and collaborative research. Thus, the WHO Chernobyl Project will offer a "forum" within which interested organizations can discuss their projects with the leaders from the three affected countries with a view to optimizing the use of resources through coordination and cooperation with others conducting programmes of aid, assistance or research. In this context, for example, further cooperation between Chernobyl Sasakawa Project and WHO is considered very important.

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Selection of the cohort for long-term clinical follow-up and assessment of radiation risks for thyroid diseases under the joint medical research project conducted by Sasakawa Memorial Health Foundation and MRRC of RAMS

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Abstract. The cohort of children in the Bryansk and Kaluga regions of Russia exposed to radioiodine in 1986 as a result of the Chernobyl accident is described in this paper. The cohort was selected under the Joint Medical Research Project on Thyroid Disease conducted by Sasakawa Memorial Health Foundation and MRRC of RAMS for the long-term clinical follow-up of the thyroid. It comprises 3,299 persons, 1,187 of whom are residents of the Bryansk region and 2,112 residents of the Kaluga region. All subjects were under 10 years old at the time of exposure. All members of the cohort have individual radiometric data for the thyroid obtained between May and June of 1986. A large proportion of the subjects lived in the most contaminated areas of the Bryansk and Kaluga regions in 1986.

The preliminary evaluation of absorbed radiation doses to the thyroid was performed before the verification of incorporated activity of ^{131}I in the thyroid, dynamics of radioiodine deposits in the territory of Russia as well as specialized cross-examination of the cohort members. Analysis of the results has shown that the statistical distribution of absorbed doses of internal exposure to the thyroid is close to log-normal distribution with a mean value of 240 mGy and standard deviation of 750 mGy for the Bryansk part of the cohort and 360 mGy for the Kaluga part. In 5% of the cohort the absorbed radiation dose to the thyroid is under 1 mGy. The maximal dose is 12 Gy for the Bryansk part of the cohort and 6 Gy for the Kaluga part.

One of the subjects followed up within the decade after the Chernobyl accident developed thyroid cancer. For the next period of the follow-up on the cohort, we plan to assess the radiation risks of developing thyroid cancer and noncancerous thyroid diseases.

Introduction

Radiation and nonradiation risks could be evaluated by cohort and case-control methods. The choice depends on the way of data accumulation and their availability for each study. If the medical and dosimetry monitoring system is close to ideal, the cohort study is preferred. In the cohort study, a group of people who, as in our case, underwent ionizing irradiation, is subjected to long-term surveillance. So individual medical, dosimetry and other data are collected for each member of the cohort, and morbidity and mortality indices, relative and attributive risks and their correlation with different factors are evaluated. The methodology of cohort organization, ways and means of data analyzing are presented in [1,2].

The cohort method was used for the analysis of morbidity and mortality in Hiroshima and Nagasaki (Japan) after the atomic bombings [3—6], for radiation risk evaluation in the nuclear industry in Canada [7], UK [8] and USA [9], and for dose-dependent morbidity and cancer incidence surveillance in recovery workers after the Chernobyl accident [10—14].

When planning a cohort study based on long-term stochastic effects of irradiation, it is important to evaluate carefully doses received by each member of the cohort. The main purpose is to estimate late effects of the accident such as cancer and other thyroid diseases, so we have to pay attention to thyroid irradiation values during the assay. One of the important factors is internal irradiation of radioactive iodine to the thyroid.

As a consequence of the accident, millions of people were subjected to radioiodine via the respiratory tract, inhaling aerosols or vapors containing radioactive iodine for 24 h or longer, and via the gastrointestinal tract by consuming contaminated food (mostly milk) in 1986. Satisfactory estimation of the absorbed dose of internal irradiation to the thyroid could be made by evaluation of the radioactive iodine level in the environment and measurement of incorporated activity in the human body [15—17].

Because of the short half-life of iodine radioisotopes (^{131}I = 8.04 days; ^{132}Te + ^{132}I = 78.2 h + 2.29 h; ^{133}I = 20.8 h), thyroid radiometry of people living in contaminated areas should have been performed from May 20 (date of the last radioactive fallout [18]) until June 15, 1986. Such up-to-date measurements were performed in Ukraine [19], Belarus [20] and Russia [16,21,22]. The most reliable data on thyroid radiometry among the above-mentioned were used when forming a cohort for long-term medical surveillance of the thyroid in irradiated subjects.

General characteristics of the cohort

Since 1991, based on the agreement between Japan and five diagnostic centers in Russia, Ukraine and Belarus, Sasakawa Memorial Health Foundation began a health study of children living in contaminated areas who were less than 10 years old at the time of the accident [23]. Children under 10 years exposed to radioiodine at the moment of the accident who live in the Bryansk and Kaluga regions of Russia also compose a cohort in the framework of the thyroid project.

There are some publications on childhood thyroid cancer risk estimation [24] as a result of external irradiation during radiodiagnosis and radiotherapy. Using the case-control method, we have also primarily estimated childhood thyroid cancer risk as a result of thyroid internal irradiation [25]. In this study, 6,000 people who were children and adolescents at the time of the accident and who live in the three most contaminated areas of the Kaluga region were subjected to the preliminary thyroid noncancer disease risk estimation. The analogous series are available for the citizens of Ukraine [26].

However, radiation risk estimation for thyroid diseases is far from a solution to the problem. According to the additional model of thyroid cancer increase prognosis [25], occasional cases began to be studied only 7—10 years after the Chernobyl Nuclear Power Plant accident. Long-term follow-up of these cases is important for estimation of the health consequences of the disaster.

One of the main tasks to be solved during radiation risk study is individual thyroid and whole-body count for all members of the cohort. Together with the Sasakawa Memorial Health Foundation, it has been agreed to include 3,000 people in the cohort; 1,000 living in the Bryansk region and 2,000 in the Kaluga region. This proportion in number of examined was conditioned by the fact that the number of thyroid radioiodine activity measurements was higher in the Kaluga region. According to the primary radiometric data obtained by the Laboratory of Clinical Dosimetry in the Bryansk Oncology Dispensary, local health care institutions in contaminated territories of the Bryansk region, and MRRC of RAMS in the Kaluga region, people of appropriate age were chosen to form a cohort. Identification of these people and their present residency was performed under the auspices of Administration of Health Care in the Bryansk and Kaluga regions.

At the present stage of our investigation, 3,299 persons are included in the cohort: 1,651 men and 1,648 women. Places of their residence in 1986 are presented in Tables 1 and 2 for the Bryansk region, and in Tables 3 and 4 for the Kaluga region, as well as the average specific surface activities of ^{137}Cs and ^{131}I (referred to May 10, 1986) [27,28].

Cohort members are presented by age and sex in Fig. 1. As can be seen in the figure, the number of men and women is almost equal. Although the age distribution was not uniform in the cohort members, the mean and the standard deviation of the age distribution by sex were close to those of the age distribution in all of the cohort members (mean = 5.5 years, SD = 3.2 years). The small number of boys and girls aged 10 years at the time of the accident is due to the fact that they graduated from high school and left to study in 1986 or to serve in the army starting from 1994 (since then residency verification of those who underwent dosimetry examination in 1986, i.e., 8 years after the accident, began).

Dosimetry characteristic of the cohort

The distribution of cohort members by ^{137}Cs and ^{131}I mean radiocontamination level (reconstruction data using ^{137}Cs fallout density) in their places of residence in 1986 is presented in Fig. 2. Interestingly, the linear regression coefficient

Table 1. Cohort members in the Bryansk region by place of residence between April and June 1986.

Village soviet	Built-up area	Average specific surface activities by May 10, 1986		Number of cohort members
		^{137}Cs (Ci/km^2)	^{131}I (Ci/km^2)	
		Bryanskii district		
Bryansk		0.25	0.8	15
		Gordeevskii district		
District subordination	Mirny	29.8	94.0	16
		Zlynkovskii district		
Bolshesherbinechskii	Bolshiye Sherbinichy	13.9	61.9	1
Dobrodeevskii	Dobrodeevka	25.7	117.7	3
Dobrodeevskii	Kamen	33.9	181.7	2
Dobrodeevskii	Krasny Kamen	27.2	133.9	2
Zlynkovskii	Kamenka	27.2	127.2	4
Karpilovskii	Karpilovka	12.4	58.8	2
Kozhanovskii	Kozhanovka	1.8	8.4	9
Lisyvskii	Lisye	13.5	68.1	4
Malosherbinichskii	Malye Sherbinichi	9.9	45.5	1
District subordination	Vyshkov	26.8	119.8	57
District subordination	Zlynka	26.4	120.8	108
Rogovskii	Rogov	13.2	58.5	25
Rogovskii	Sofyevka	15.9	69.6	6
Spiridono-Budskii	Cpridonova Buda	11.4	56.1	21
		Klimovskii district		
Kirillovskii	Kirillovka	0.7	2.9	1
District subordination	Klimovo	7.3	25.1	25
Staroyurkovichskii	Starye Yurkovichi	1.1	5.2	2

(*cont.*)

between ^{131}I fallout density (right panel) and ^{137}Cs fallout density (left panel) depends on the distance between the built-up area contaminated by these radionuclides and the Chernobyl Nuclear Power Plant [27]. In Fig. 2, the distribution of cohort members from western districts of the Bryansk region and southern districts of the Kaluga region is presented. The scales on the abscissa axis in the left and right parts of Fig. 2 cannot be calculated just by multiplication by the constant. As is also seen in Fig. 2, the contamination levels of ^{137}Cs and ^{131}I in the place of residence differ by 3- to 4-fold among the cohort members.

Let us further consider thyroid radiometry data for the members of the cohort. There are three types of data according to methods and devices used.

Type 1. In 209 Bryansk members of the cohort, radiometry was performed using a "Gamma" spectrometer in the Bryansk Oncodispensary. Incorporated activity was estimated by collimate detector application on the neck and middle

Table 1. Continued.

Village soviet	Built-up area	Average specific surface activities by May 10, 1986		Number of cohort members
		^{137}Cs (Ci/km^2)	^{131}I (Ci/km^2)	
		Krasnogorskii district		
Barsukovskii	Bukovets	64.6	216.7	1
Barsukovskii	Tugani	68.5	227.6	3
Zaborskii	Zaborye	100.3	329.0	8
Kurganovskii	Nikolaevka	75.4	248.1	7
Kurganovskii	Novoaleksandrovka	65.9	217.3	3
Kurganovskii	Rubany	17.8	56.8	1
Kurganovskii	Yamishe	53.2	176.8	4
Letyakhovskii	Letyakhi	3.6	10.9	1
District subordination	Krasnaya Gora	5.9	18.5	26
Seletskii	Selets	12.5	40.3	7
Uvelskii	Bailki	26.7	91.0	1
Uvelskii	Barskii	20.1	65.9	10
Uvelskii	Uvelye	40.9	136.3	3
Yalovskii	Yalovka	63.0	204.0	1
		Novozybkovskii district		
	Novozybkov	15.5	56.0	708
Vereshakskii	Vereshaki	16.4	57.3	20
Vnukovichskii	Vnukovichi	16.5	56.6	7
Demenskii	Demenka	27.7	112.3	2
Demenskii	Perevoz	24.5	101.8	3
Demenskii	Filial V.E.U.R.	23.8	94.5	7
Zamishevskii	Zamishevo	14.5	49.2	5
Katichskii	Katichi	15.6	56.1	6
Novobobrovichskii	Novye Bobrovichi	26.0	96.8	3
Novomestskii	Novoye Mesto	23.5	92.9	4
Svyatskii	Svyatsk	37.4	151.7	16
Sinekolodetskii	Krutoberyozka	11.4	38.8	3
Sinekolodetskii	Sinii Kolodets	13.9	45.9	1
Snovskii	Dubrovka	18.8	70.6	1
Snovskii	Snovskoye	10.6	37.5	4
Starobobrovichskii	Starye Bobrovichi	25.2	98.4	1
Starovishkovskii	Staryi Vishkov	31.6	129.9	10
Starorudnyanskii	Staraya Rudnya	16.6	60.5	1
Starorudnyanskii	Khaleevichi	23.6	77.3	1
Trostanskii	Druzhba	13.9	48.7	1
Trostanskii	Mamai	16.1	56.4	1
Trostanskii	Trostan	12.4	53.4	2

part of the hip (the coefficient of "illuminating" of the detector had been taken into consideration when carrying out whole-body cesium γ radiometry). The details of the estimation are presented in [17].

Table 2. Cohort members in the Bryansk region by administrative district between April and June 1986.

Administrative district	Number of cohort members
Bryanskii	15
Gordeevskii	16
Zlynkovskii	245
Klimovskii	28
Krasnogorskii	76
Novozybkovskii	807
Total in Bryansk region	1187

Table 3. Cohort members in the Kaluga region by place of residence between April and June 1986.

Village soviet	Built-up area	Average specific surface activities by May 10, 1986		Number of cohort members
		^{137}Cs (Ci/km^2)	^{131}I (Ci/km^2)	
		Zhizdriskii district		
District subordination	Zhizdra	2.1	6.68	302
Akimovskii	Verkhnyaya Akimovka	0.71	2.15	1
Akimovskii	Oslinka	0.49	1.38	8
Korenevskii	Korenevo	4.62	15.40	11
Korenevskii	Dubrovka	2.09	6.79	2
Korenevskii	Uleml	2.85	9.82	2
Nikitinskii	Muzhitino	1.74	5.48	26
Ovsorokskoi	Ovsorok	3.28	10.76	16
Ovsorokskoi	Sudimir	3.36	12.49	37
Ogorskoi	Ogor	1.89	5.79	18
Ogorskoi	Berezovka	1.50	4.69	1
Ogorskoi	Berezovskii Razyed	1.53	4.65	8
Ogorskoi	Likhovatka	1.06	3.12	1
Ogorskoi	Ustye	1.38	4.14	1
Petrovskii	Ctudenets	1.85	5.86	2
Petrovskii	Zikeevo	2.20	7.04	31
Polyudovskii	Plyudovo	1.32	4.20	21
Polyudovskii	Shigry	4.52	15.18	4
Sovetskii	Kollektivizator	1.99	6.44	17
Sovetskii	Gorki	6.74	21.58	1
Sovetskii	Murachevka	2.44	7.90	4
Sovetskii	Polom	4.22	14.49	1
Ulemetskii	Ulemets	1.63	5.13	19
Ulemetskii	Kalinino	2.24	7.20	3
Ulyano-Leninskii	Mladensk	6.74	22.01	36
Ulyano-Leninskii	Beli Kolodets	4.26	14.33	3
Ulyano-Leninskii	Polyana	5.95	19.66	2
Yarovshinskii	Yarovshina	3.26	10.97	11
Yarovshinskii	Avdeevka	5.39	18.11	1
Yarovshinskii	Orlya	4.05	13.32	3
Yarovshinskii	Pesochnya	6.86	22.66	2

(*cont.*)

Table 3. Continued.

Village soviet	Built-up area	Average specific surface activities by May 10, 1986		Number of cohort members
		^{137}Cs (Ci/km^2)	^{131}I (Ci/km^2)	
		Ulyanovskii district		
District subordination	Dudorovskii	6.02	24.78	96
Afanasovskii	Afanasovo	7.81	27.04	18
Brezhnevskii	Brezhnevo	2.10	6.95	5
Brezhnevskii	Veino	2.90	9.72	2
Brezhnevskii	Gromozdovo	4.04	13.66	1
Volosovo-Dudinskii	Volosovo-Dudino	1.13	3.6	4
Volosovo-Dudinskii	Beli Kamen	1.06	2.59	3
Volosovo-Dudinskii	Dretovo	0.54	1.61	4
Volosovo-Dudinskii	Efimtsevo	2.36	7.79	15
Volosovo-Dudinskii	Zhukovo	3.03	10.15	1
Volosovo-Dudinskii	Slobodka	4.26	14.57	2
Vyazovenskii	Vyazovna	2.09	2.9	5
Kasyanovskii	Kasyanovo	3.74	12.61	10
Kireikovskii	Kireikovo	4.34	15.08	24
Krapivenskii	Krapivna	5.66	19.63	30
Krapivenskii	Vesnin	8.01	27.29	2
Medyntsevskii	Medyntsevo	3.08	10.36	4
Medyntsevskii	Staritsa	2.87	9.76	1
Ktsynskii	Ktsyn	4.61	16.74	9
Ozerenskii	Ozerno	1.14	3.61	4
Ozerenskii	Goskovo	2.99	10.01	8
Ozerenskii	Zheleznitsa	3.46	11.70	1
Panevskii	Dubna	1.64	5.45	10
Panevskii	Glinnaya	1.26	2.29	1
Panevskii	Zhilkovo	1.63	5.29	15
Panevskii	Nikitskoye	2.85	9.46	2
Pozdnyakovskii	Pozdnyakovo	6.40	21.59	22
Pozdnyakovskii	Annino	3.97	13.39	1
Pozdnyakovskii	Verkhnyaya Peredel	3.64	12.26	2
Pozdnyakovskii	Ershi	3.40	11.40	3
Pozdnyakovskii	Nizhnyaya Peredel	4.48	15.16	4
Pozdnyakovskii	Romanovka	5.23	17.77	2
Ukolitskii	Ukolitsa	2.09	7.37	12
Ukolitskii	Sorokino	3.69	12.70	12
Ukolitskii	Svoboda	3.35	11.62	7
Ulyanovskii	Ulyanovo	3.66	13.05	280
Ulyanovskii	Debr	4.53	15.47	1
Ulyanovskii	Dolgoye	4.05	13.69	5
Ulyanovskii	Durnevo	4.10	14.49	6
Ulyanovskii	Obukhovo	4.25	14.38	3
Ulyanovskii	Rechitsa	4.39	14.97	1
Ulyanovskii	Ulyanovskii Penkozavod	4.46	15.02	6
Ulyanovskii	Fursovo	4.48	15.08	18
Ulyanovskii	Zarechye	5.08	19.89	124
Yagodninskii	Melikhovo	6.61	23.07	2
Yagodninskii	Sopovo	5.10	17.36	1
Yagodninskii	Shvanovo	4.47	16.10	5

(*cont.*)

Table 3. Continued.

Village soviet	Built-up area	Average specific surface activities by May 10, 1986		Number of cohort members
		^{137}Cs (Ci/km^2)	^{131}I (Ci/km^2)	
Khvastovichskii district				
District subordination	Elenskii	4.24	15.88	55
Elenskii	Dolina	5.39	20.19	9
Avdeevskii	Avdeevka	0.51	1.46	4
Avdeevskii	Kudryavets	1.92	5.94	21
Avdeevskii	Kurgan	0.75	2.32	1
Avdeevskii	Tereben	1.28	3.96	40
Berestnyanskii	Kolodyass	7.29	25.13	42
Berestnyanskii	Berestna	7.64	25.94	3
Boyanovichskii	Boyanovichi	0.46	1.28	25
Votkinskii	Votkina	5.11	15.81	7
Klenovskii	Klen	1.31	4.31	7
Krasnenskii	Krasnoye	1.69	5.37	54
Krasnenskii	Sevastopol	1.81	5.73	3
Kudryavetskii	Kolonna	0.91	2.87	2
Lovatskoi	Lovat	5.34	18.54	5
Lovatskoi	Baranovka	4.90	16.63	1
Mileevskii	Mileevo	2.94	10.11	10
Mileevskii	Resseta	8.00	27.13	1
Nekhochskoi	Nekhochi	0.59	1.76	1
Nekhochskoi	Alekseevka	0.59	1.73	1
Palkevichskii	Palkevichi	0.90	2.41	1
Palkevichskii	Doktorovo	0.61	1.83	1
Penevichskii	Penevichi	0.85	2.88	3
Podbuzhskii	Podbuzhye	1.20	3.78	42
Slobodskoi	Sloboda	0.86	2.65	15
Slobodskoi	Kletno	1.04	3.16	1
Staikovskii	Staiki	0.69	1.99	5
Khvastovichskii	Khvastovichi	1.72	5.46	362
Khvastovichskii	Uspenskii	1.34	4.17	1

Type 2. In 982 Bryansk members of the cohort, measurements were performed using a radiometer-dosimeter SRP-68-01 with a noncollimated detector. All

Table 4. Cohort member in the Kaluga region by administrative district between April and June 1986.

Administrative district	Number of cohort members
Zhizdrinskii	595
Ulyanovskii	794
Khvastovichskii	723
Total in Kaluga region	2112

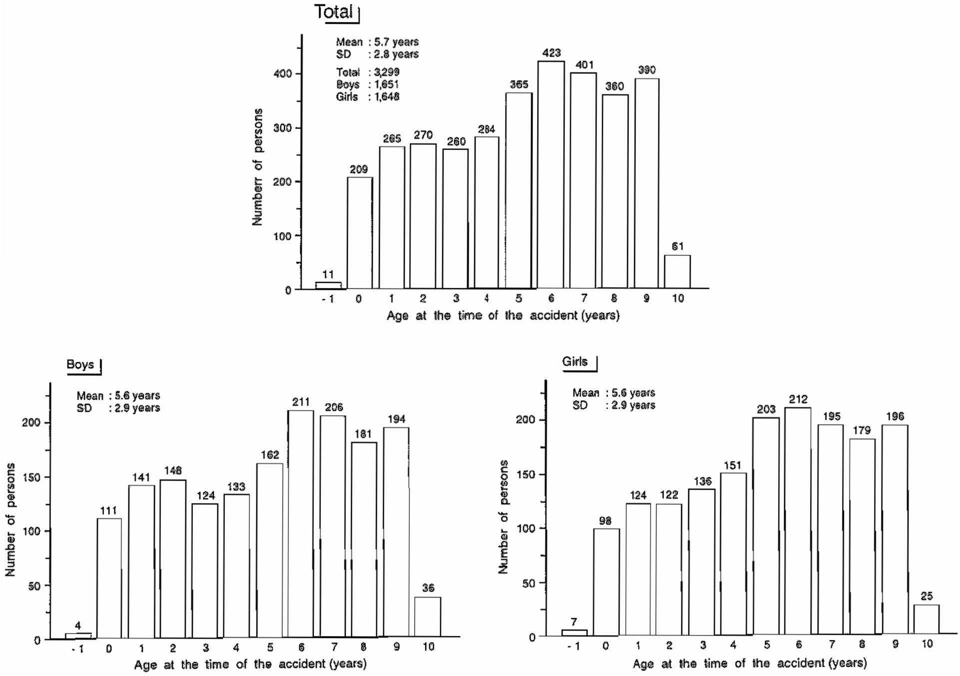

Fig. 1. The cohort members by sex and age at the time of the accident. The bar at " – 1" on the abscissa presents the number of people who were born after the accident and received thyroid radiometry.

studies were carried out by medical personnel in the Bryansk region following the method developed in the Moscow Research Institute of Diagnostics and Surgery (MRIDS). Basically, exposure dose measurements (EDM) were performed only in the neck region, along with EDM inside the building where the examination was performed [29]. Additional estimation of incorporated activity in the hip area was performed for 10% of the examined. Calibration of radiometers-

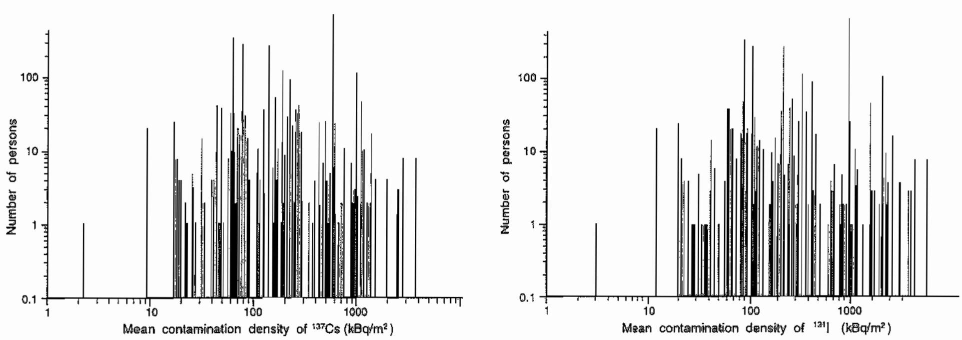

Fig. 2. The cohort members by mean soil contamination density of ^{137}Cs (measured [28] in place of residence in 1986) and ^{131}I (reconstructed [27] for May 20, 1986).

dosimeters was performed by MRIDS fellow V.I. Trushin. Calibration coefficients which were in error limits agreed with those received during the study [30]. Results were then used for ^{131}I-incorporated activity estimation in the thyroid [29] following the method for those in whom two EDM were performed [30]. In cases when only one EDM was performed, ^{131}I activity A was calculated using the following formula [29]:

$$A = GR(P_1 - 0.9P_2),$$

where G is the calibration constant which depends on age; R is the correction coefficient (depends on time of measurement and age), estimated based on thyroid radiometry results; and P_1 and P_2 are EDM of the neck area and inside the building where the examination was performed.

Such a way of estimation is less accurate than type 1 measurement, so it has to be singled out. Both types 1 and 2 radiometry data estimated after the accident are available for two Bryansk members of the cohort.

Type 3. In 2,112 Kaluga members of the cohort, measurements were performed by MRRC of RAMS fellows using a radiometer-dosimeter SRP-68-01 with a noncollimated detector. Most cohort members underwent EDM of the neck area and liver projection. Methods and results are presented in [17]. Results of such measurements are more precise than type 2 estimations because they were performed by trained specialists.

When interpreting the results, it is important to take into consideration the coefficient of “illuminating” of the detector caused by γ irradiation of radioactive cesium [17,30]. This work is nearly finished for the Kaluga part of the cohort. In this article we consider radiometry results (not defined precisely for type 3 measurements) for all members of the cohort and present preliminary data for absorbed internal thyroid dose.

Thyroid radiometry results for cohort members are presented in Fig. 3. More precise measurements (type 1 data) were performed in a longer time period than ^{131}I half-life (8.04 days) since May 15, 1986. By that time, the main fallout of ^{131}I ended in the Bryansk region [31]. The right panel in Fig. 3 should not be considered as one presenting thyroid ^{131}I concentration dynamics. It could be explained by the fact that time of measurement and ^{131}I contamination density in places of residence were different for each cohort member. However, the activity evaluated in all cohort members varied from 0.1 to 1,000 kBq. Almost all type 2 measurements were performed in June 1986, which increases thyroid ^{131}I activity evaluation error because of the coefficient of “illuminating” of the detector. Type 3 measurements in Kaluga members of the cohort were performed in optimal intervals, although the coefficient of “illuminating” of the detector was also significant [17]. According to the preliminary data [17], when taking into consideration the coefficient of “illuminating” for Kaluga members of the cohort, the previous estimates will be reduced by an average of 3.7 kBq.

Further thyroid irradiation load composed of external [31], and internal [17]

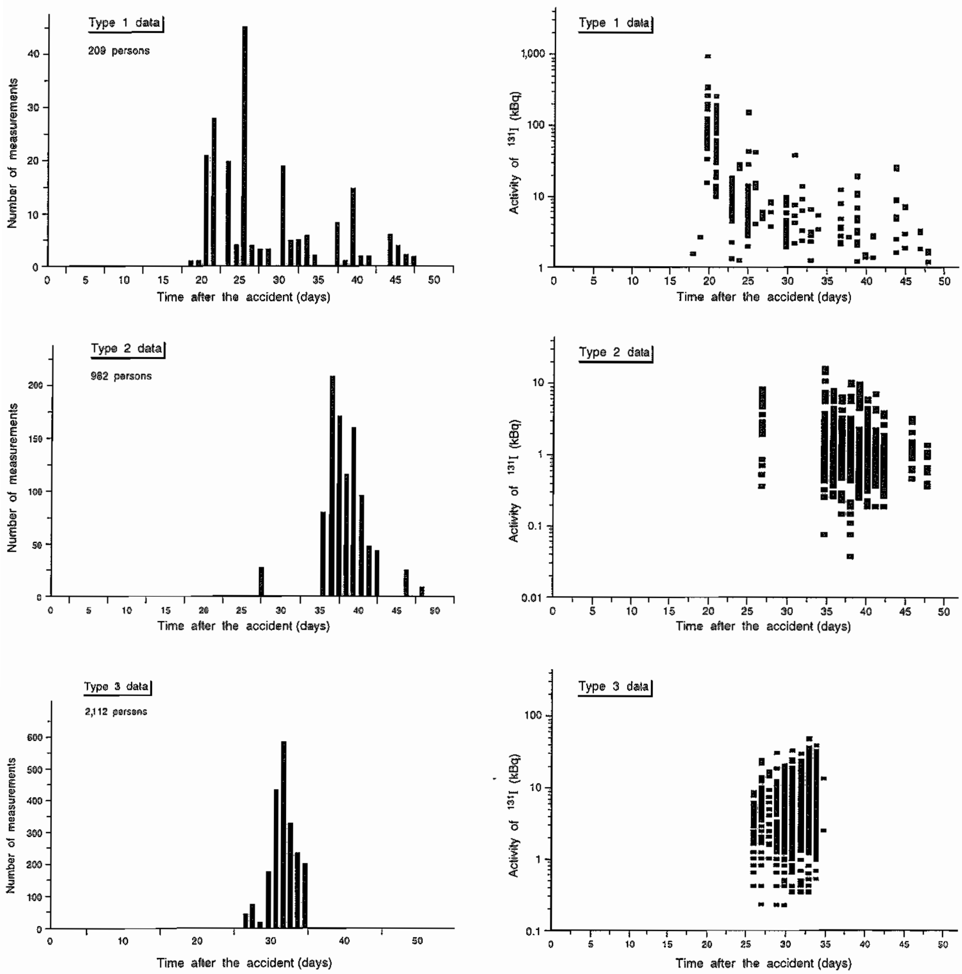

Fig. 3. The distribution of ^{131}I incorporated in the thyroid (left panel) and estimated ^{131}I (right panel) on the basis of measurements of different materials. For type 3 data, the coefficient of "illuminating" of the detector by ^{137}Cs and ^{134}Cs γ irradiation was not corrected.

irradiation, individual whole-body count, main dose composing radionuclide fallout and their concentration in the lower atmosphere, migration and nutrition of cohort members in the contaminated area, preventive measures undertaken, and other factors should be taken into account. A questionnaire was developed for individual migration and nutrition regimens of cohort members living in the contaminated area (cf. Suppl. 1). The questionnaire was used in 1996 during special medical surveillance of cohort members.

Before individual data evaluation and more precise estimation of radionuclide fallout using the turbulent atmosphere diffusion model and experimental data [18], we performed a preliminary count of incorporated ^{131}I thyroid internal irra-

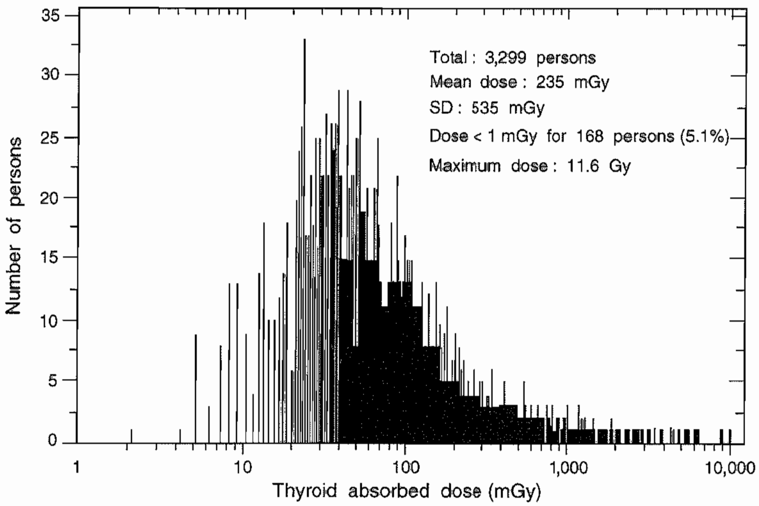

Fig. 4. The spectrum distribution of the absorbed dose to the thyroid among cohort members estimated from incorporated ^{131}I (preliminary data).

diation absorbed dose (without taking into account ^{132}I and ^{133}I isotopes) in cohort members following the model [16]. The results are presented in Fig. 4 as spectrum distribution of the absorbed thyroid dose in cohort members.

As shown in Fig. 4, the internal irradiation thyroid dose in cohort members lies in the interval of 1—10,000 mGy. The highest density is observed within the interval of 40—2,000 mGy. According to the individual radiometry data, nonincorporated radioiodine at the time of measurement was detected in 5.1% of all cohort members. After ^{131}I thyroid activity correction in Kaluga members of the cohort, this percentage will undergo an approximately 2-fold increase. This part of the cohort might be considered as a control in further studies. However, the fact that all cohort members received whole-body irradiation after the accident (including thyroid irradiation) because of external irradiation by soil-contaminating radionuclides should be taken into consideration. It is also possible that some cohort members in whom ^{131}I activity was lower than detection limits at the time of measurement received irradiation load by inspiration of ^{131}I in aerosol and gas modes which composed the radioactive cloud. However, this factor can be considered as reliable only after analysis of screening data.

A histogram of the thyroid absorbed dose is presented in Fig. 5 (log scale in abscissa). The density of absorbed dose distribution, $f(D)$, is close to that of a lognormal distribution. The total number of individual radiometry data is not enough to form a cohort of several thousand members for whom the distribution density $f(D)$ would be uniform within a larger interval. That is why further radiation risk research requires the solution of mathematical problems connected with the wide difference between dose and uniform distribution.

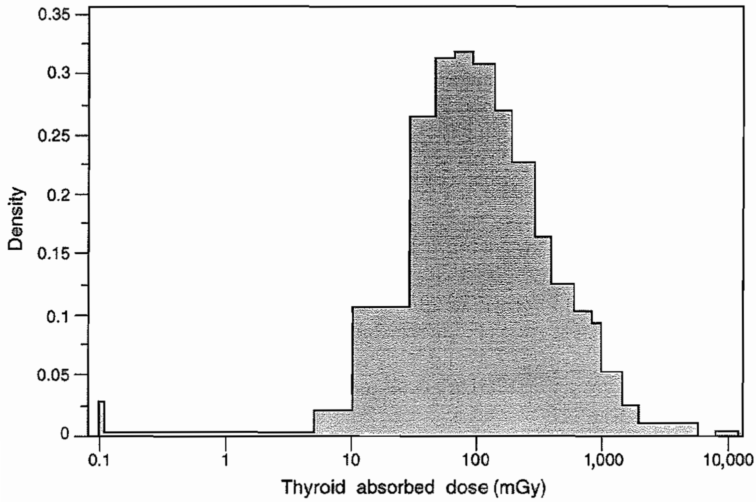

Fig. 5. The distribution density of the absorbed dose to the thyroid among cohort members (log scale on the abscissa).

Conclusions

As a result of individual thyroid radiometry performed in the Bryansk and Kaluga regions of Russia, the initial cohort was composed of 3,299 boys and girls who were under 10 years old at the time of the accident. A cohort study of thyroid oncologic and nononcologic diseases began in the framework of the international project carried out by MRRC of RAMS and Sasakawa Memorial Health Foundation with the participation of the health care departments of Bryansk and Kaluga regional administration.

Cohort members are residing in the most contaminated areas of the Bryansk and Kaluga regions. One member already underwent surgery for thyroid cancer. According to our preliminary estimation, the mean thyroid internal irradiation dose by incorporated radioiodine was 235 mGy with a standard deviation of 535 mGy. The maximal irradiation dose was 11.6 Gy. Further studies on the dynamics of radionuclide fallout, nutrition, living conditions in contaminated areas and many other parameters will let us elaborate reliable data for the consequences of the Chernobyl accident.

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Supplement 1

Questionnaire

given to persons included in the long-term observation cohort for the state of the thyroid

I. IDENTIFICATION

1.1 Surname ____________________
1.2 First name ____________________
1.3 Patoronymic ____________________
1.4 Date of birth (day, month, year) ____________________
1.5 Sex (m – male, f – female) ____________________
1.6 Registration number RGMDR ____________________
1.7 Registration number in the cohort ____________________

II. PERMANENT PLACE OF RESIDENCE AT THE TIME OF REGISTRATION IN THE COHORT

2.1 Settlement ____________________
2.2 Village soviet ____________________
2.3 Rayon ____________________
2.4 Oblast ____________________
2.5 Mail address ____________________
2.6 TERSON-code of the settlement ____________________

III. REGIME OF RESIDENCE AND NUTRITION ON THE TERRITORY CONTAMINATED WITH RADIONUCLIDES

(in corresponding rectangle write + , x, etc. when being in the indicated settlement)

III-1. RESIDENCE PERIOD IN THE SETTLEMENT SINCE APRIL 26, 1986.

3.1.1 Settlement ____________________
3.1.2 Village soviet ____________________
3.1.3 Rayon ____________________
3.1.4 Oblast ____________________
3.1.5 Mail address ____________________
3.1.6 TERSON-code of the settlement ____________________
3.1.7 Residence period in the indicated settlement from April till June 20, 1986 (approximately on days) :

26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

3.1.8 Further residence period in the indicated settlement (approximately on months) :

	1	2	3	4	5	6	7	8	9	10	11	12
1986												
1987												
1988												
1989												
1990												
1991												
1992												
1993												
1994												
1995												
1996												
1997												
1998												
1999												

(1986 boxes cover months 6–12 only.)

III-2. RADIOMETRY OF THYROID AND PROTECTIVE ACTIONS.

3.2.1 Radiometry of thyroid in May - June 1986 : ☐ yes ☐ no ☐ not established

3.2.2 Conducting I-prophylaxis ☐ yes ☐ no ☐ not established

3.2.3 Date of conducting I-prophylaxis ______________________

3.2.4 Comment (s) ______________________

III-3. REGIME OF CONDUCTION SINCE APRIL 26, 1986.

3.3.1 Living in the house : "b" (brick) or "w" (wooden) ☐ "b" ☐ "w"

3.3.2 Visiting child pre-school and school institutions ☐ yes ☐ no
(in the field "yes" write "b" (brick) or "w" (wooden)
(if "no", in the field "no" write +, -, x etc.)

3.3.4 Comment (s) ______________________

III-4. MILK RATION IN THE GIVEN SETTLEMENT SINCE APRIL 26, 1986:

3.4.1 Consumption of milk in May - June 1986 :

milk from individual farm, L/day	☐ no	☐ 1/4	☐ 1/2	☐ 1	☐ 1.5	☐ 2	☐ >2
milk from collective farm, L/day	☐ no	☐ 1/4	☐ 1/2	☐ 1	☐ 1.5	☐ 2	☐ >2

calendar day of stopping the consumption of milk in May 1986
(everything necessary enter over "?", otherwise strike out over "31") ☐ ? ☐ 31

For infants born in May - June 1986:
Breast-feeding — ☐ yes ☐ no ☐ not established

3.4.2 Consumption of milk in the following years :

milk from individual farm, L/day	☐ no	☐ 1/4	☐ 1/2	☐ 1	☐ 1.5	☐ 2	☐ >2
milk from collective farm, L/day	☐ no	☐ 1/4	☐ 1/2	☐ 1	☐ 1.5	☐ 2	☐ >2

3.4.3 Availabillity in the ration (regular consumption) :

mushrooms — ☐ yes ☐ no

IV. RADIATION EFFECTS FROM MEDICAL PROCEDURES

4.1 Number and type of radiodiagnostic or radioisotopic procedure

____
____
____
____

V. SOURCE OF THE DATA

5.1 Institution, employee of which was conducted questioning ______________________

5.2 Surname, first name and patronymic of the person ______________________

5.3 Date of conducted questioning ______________________

Chernobyl: A Decade
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Thyroid cancer in children: comparison among cases in Belarus, Ukraine, Japan and other countries

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Introduction

A catastrophic accident occurred at the Chernobyl Nuclear Power Station in the northern Ukraine on April 26, 1986. Since the accident, numerous reports have appeared on thyroid diseases in children and conclusions have changed over time. In 1991, the report published from the International Atomic Energy Agency (IAEA) concluded that, at the time of the project study, there were significant nonradiation-related health disorders in the populations of both surveyed contaminated and surveyed control settlements, but no health disorders that could be attributed directly to radiation exposure [1]. In 1992, however, it was reported in *Nature* that the number of children with thyroid cancer increased in Belarus [2]. This correspondence was supported [3], but three opposing comments were also published in the next numbers of *Nature* [4–6]. Ten years after the accident, three major symposia were held in succession in November 1995, March 1996, and April 1996 by the World Health Organization (WHO), the EC (European Commission), and the IAEA, respectively [7–9]. At the International Conference entitled "One Decade after Chernobyl: Summing up the Consequences of the Accident", it was concluded that a highly significant increase in the incidence of thyroid cancer among persons in the affected areas who were children in 1986 is the only clear evidence to date of a public health impact of radiation exposure as a result of the Chernobyl accident [10].

The dramatic increase in thyroid cancer among children around Chernobyl after 1990 raises several questions.

1. Is the thyroid cancer in children clinically different from that in older persons?
2. Are there any differences in thyroid cancer between persons in the radiation-affected areas and those in other areas?
3. Even specialists in the treatment of thyroid cancer have had little experience with the disease in children. How can we achieve an international consensus concerning the treatment of thyroid cancer in children?

In order to address these questions, we compared the clinical and histological characteristics of childhood thyroid cancer around Chernobyl to radiation-non-exposed cases in Japan and other countries.

Number of thyroid cancer cases among children

According to the report by WHO at the International Conference in Vienna on April 1996, the overall number of cases of thyroid cancer detected after the accident (1986–1995) in children who were aged between 0 and 14 years old at the time of accident was 424 in Belarus, 104 in Russia and 362 in the Ukraine, respectively [11]. For the first 4 years following the Chernobyl accident, 54 cases of thyroid cancer were found around Chernobyl. The starting point of the dramatic increase in thyroid cancer was noted in 1990 in the three republics of the former USSR. In the Sasakawa Chernobyl Project, which has screened more than 150,000 children who were aged between 0 and 10 years old at the time of the accident in the Republic of Belarus (Mogilev, Gomel), the Ukraine (Zhitomir, Kiev) and Russian Federation (Bryansk) since 1991 using highly reliable techniques under a uniform and standardized protocol, 65 cases of thyroid cancer were confirmed in children both cytologically and histologically over a period of 5 years [12–16]. The number of thyroid cancer cases in each diagnostic center was three in Mogilev, 39 in Gomel, six in Kiev, nine in Zhitomir and eight in Bryansk. The prevalence of thyroid cancer in the Gomel region was 202 cases per 100,000 children.

Since the prevalence of thyroid cancer in children is quite low in Japan, we reviewed the cases diagnosed and treated in two major hospitals performing thyroid surgery: Ito Hospital in Tokyo and Kuma Hospital in Kobe. Between 1962 and 1995, 27 cases and 10 cases of thyroid cancer were treated in children under 15 years old at Ito Hospital and Kuma Hospital, respectively. All cases had no past history of radiation exposure (internal or external).

Harach and Williams reported the childhood thyroid cancer rate in England and Wales [17]. A total of 154 cases of thyroid cancer in children under 15 years old were registered in England and Wales over a period of 30 years, an incidence of about 0.5 per million per year. A total of 4.5 cases per year were registered between 1963 and 1972, 4.9 between 1973 and 1982 and 5.8 between 1983 and 1992.

In other reports the prevalence of thyroid cancer in children varies from approximately 0.2 to five cases per million population per year [18–20]. Fewer than 10% of thyroid cancers occur in children.

Age distribution

The age distribution at the time of surgery for thyroid cancer in children around Chernobyl found by the Sasakawa Chernobyl Project showed a peak at 10 years. And the age at the time of accident ranged from 0.2–7.4 years with a mean age of 2.7 years.

Demidchik et al. reported on the 386 cases of childhood thyroid cancer in Belarus after the Chernobyl accident [21]. Of these, 251 cases (65.0%) were aged between 0 and 4 years old at the time of the accident, 125 (32.4%) were aged between 5 and 9 years old and only 10 cases (2.6%) were aged between 10 and 14 years old, suggesting that the younger age group was most susceptible to the carcinogenic effect of thyroid exposure from radioactive fallout.

On the other hand, the age distribution at the time of operation in Japan shows a smooth increase between the ages of 8 and 14 years old, a tendency which has also been observed in other countries. In England and Wales the age distribution at the time of operation in a study of 154 children with thyroid cancer showed a smooth increase between the ages of 6 and 14 years [17].

Clinical behavior of childhood thyroid cancer

Some reports showed that thyroid cancer grows and spreads more aggressively in children than in adults. Zimmerman and colleagues from the Mayo Clinic summarized the clinical behavior of thyroid cancer in three groups based on the age at diagnosis: children under 11 years old, children aged between 11 and 17 years old and adults (Table 1) [22]. Extrathyroidal tumor invasion was more frequent in the young children, while the clinical behavior was similar in adults and older children. Neck node metastases were similarly frequent in younger and older children and thus more frequent in children than in adults. Distant metastases occurred as frequently in younger as in older children; adults showed a lower frequency of distant metastases.

Among 37 Japanese cases in children, 27 cases (73%) and seven cases (19%) showed regional lymph-node metastasis and pulmonary metastasis, respectively. The number of cases showing the extension to surrounding tissues was 13 (35%).

Among the Belarussian cases, pT4 stage (extracapsular spread of the tumor) was diagnosed in 50% of cases, and lymph-node metastasis was detected in 67% [21].

Among the Ukrainian cases, lymph-node metastasis was observed in 59.0% of cases, and 23.7% of cases showed metastasis to the lungs at the time of surgery [23]. The characteristics of thyroid cancers observed in the children of Belarus and Ukraine overlap those seen in Japan and Western countries.

Table 1. Clinical behavior of childhood thyroid cancer

Age	Belarus[a]	Ukraine[b]	Japan	Mayo Clinic[c]		
	< 14 years	< 15 years	< 15 years	< 11 years	11–17 years	Adult
Cases	244	196	37	22	68	1761
Invasion						
Soft tissues	50%		35%	33%	14%	14%
Metastasis						
Lymph-nodes	67%	59%	73%	88%	80%	36%
Distant site	4.5%	24%	19%	8%	8%	8%

[a]From Health Consequences of the Chernobyl Accident [7]. [b]From Tronko et al. [23]. [c]From Zimmerman et al. [22].

Treatment, follow-up and mortality

Figure 1 presents a summary of treatment and follow-up for thyroid cancer in Japanese children. The follow-up period ranged from 10 months to 23.6 years, with a mean of 129.4 months. All seven cases with lung metastasis at initial surgery were treated with I-131 three to eight times (180—689 mCi) postoperatively.

After the first operation, four patients showed cervical lymph-node metastasis and three had lung metastases. As shown in Fig. 1, all were treated with either additional neck dissections or I-131 irradiation.

Among the 37 cases, only one patient with papillary carcinoma died 11 years after the surgical treatment. The tumor was multifocal and extended to surrounding tissues. Total thyroidectomy was performed, but radical neck dissection was impossible because of the severe adhesion to surrounding tissues.

Among the 154 cases of thyroid cancer in children in England and Wales, five children with differentiated thyroid cancer of follicular cell origin died up to 17 years after diagnosis [17]. Two of eight children aged 9 years old or less with a 20-year follow-up died, compared with three of 28 older children.

According to the review by Robbins, there were only 19 deaths among a total of 771 children in Western countries whose thyroid cancer was diagnosed before the age of 16 years. Some of these occurred early in the course of the disease, but the median survival was 22 years and the longest was 42 years [24].

To date, several children in the cohort of diagnosed cases have died of thyroid cancer around Chernobyl, but it is too early to draw a conclusion about the survival of the other children suffering from thyroid cancer around Chernobyl. Reiners and colleagues treated 95 children from Belarus suffering from the most advanced stages of thyroid cancer using radioiodine between April 1, 1993 and

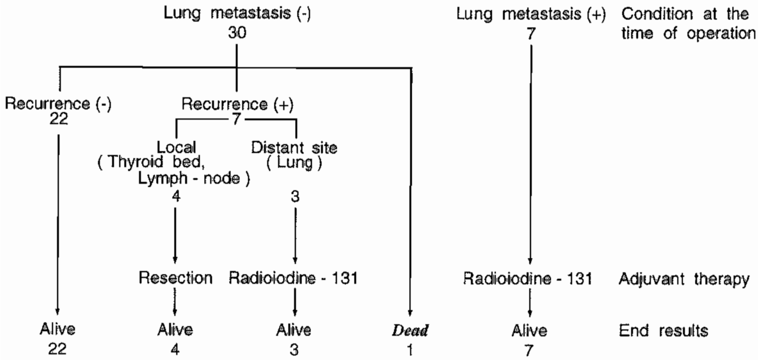

Fig. 1. Summary of treatment and follow-up of childhood thyroid cancer in Japan: 33 cases of papillary carcinoma and four cases of follicular carcinoma. All of the seven cases with lung metastasis at the initial operation were papillary carcinoma. The follow-up period ranged from 10 months to 23.6 years. After the first operation, seven cases recurred and they received an adjuvant therapy, either resection or radioiodine-131 therapy. Only one patient with papillary carcinoma died 11 years after surgical treatment.

November 15, 1995 in Germany [25]. They indicated that the preliminary results of radioiodine treatment are promising.

In any case, a uniform consensus concerning the initial operation is important, and intensive care for the patients and long-term follow-up after the initial treatment is essential.

Histology

Table 2 is a summary of histological findings of thyroid cancer in children. The great majority of cases in Belarus and Ukraine were papillary carcinomas [26]. Within the papillary carcinoma group, over 70% of the thyroid cancers in Belarus and the Ukraine were of the solid type. The frequency of a solid growth pattern was unexpectedly high when compared with the cases in Japan and other Western countries [16]. This indicates the aggressive potential of the thyroid cancers in Belarus and Ukraine, since the presence of a solid pattern can be considered to indicate poor differentiation.

Summary

The answers to the three questions raised in the introduction are as follows:

1. Thyroid cancer is more clinically aggressive in children than in adults.
2. The characteristics of thyroid cancers observed in the children of Belarus and Ukraine overlap those seen in Japan and Western countries. However, the age distribution and histological subtype were quite different.
3. So far there is no international consensus concerning treatment for thyroid cancer in children. International discussions to achieve a uniform consensus concerning the first operation and intensive care after the initial treatment is an urgent necessity.

Conclusion

A 100-fold increase in any cancer within 5 years is unprecedented and provides a unique opportunity to understand the mechanisms of carcinogenesis and to identify factors which may be important in cancer prevention. This requires internationally coordinated investigations within the framework of well-designed studies

Table 2. Histological findings in childhood thyroid carcinoma.

	Belarus[a]	Ukraine[a]	Japan	England and Wales[a]
Number of cases	134	114	37	81
Proportion of papillary carcinoma	99%	96%	89%	68%
Solid/follicular papillary carcinoma	72%	76%	18%	40%

[a]From Williams et al. [26].

using sophisticated methods of dosimetry, epidemiology, clinical medicine, pathology and molecular biology.

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Discussion on the international thyroid problems after the Chernobyl accident in Ukraine: present studies and future joint projects

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In this session on the thyroid there are many topics to be discussed, but I would like to focus only on future needs. We all agree that the incidence of thyroid cancer increased after the Chernobyl accident. This is clear from both geographical and chronological evidence. The increase has been observed in Belarus and next in Ukraine, and since 3 years ago the Russian Federation has also agreed there has been an increase in thyroid cancer. The highest incidence was found in Gomel. Most of the international experts agree on this conclusion, but we do not know the cause of this increase in thyroid cancer. Therefore, as a future need with regard to thyroid cancer, our first priority is to treat young patients with thyroid cancer by surgical/radiological treatment and the supplementation of thyroxine, vitamin B and calcium. Second is the elucidation of the cause of the thyroid cancer using dosimetry, reconstruction of doses, biological dosimetry of ^{131}I, ^{132}I, ^{133}I and external radiation, as well as the elucidation of the causes by epidemiological investigations, and again the role of ^{131}I and other short-life isotopes, and the quantification of the risks and impact of screening, the role of modifying factors, identification and quantification. This can be done by cohort or case-control studies and studies on children born after the accident. Again, these are the things we have to do in the future, and it is very important to do a complete registration of young people undergoing surgery for thyroid cancer, which includes history of radiation exposure, clinical investigations, pathological findings and storage of blood samples and tissues for current and future study. We must also consider the prevention of thyroid diseases and cancer, possibly by iodine supplementation or the screening of high-risk groups such as children who were younger than 2 or 3 years old at the time of the accident. The international framework upon which I would like to focus in this discussion includes information and cooperation to avoid duplication of studies and to enhance quality. We now have representatives from the Republic of Belarus, Ukraine, Russian Federation, Sasakawa Memorial Health Foundation, WHO, EC, USA, France, Germany and other countries, as well executive members of the International Thyroid Congress, and it is on this international framework that I would like to focus. Because many organizations are making similar efforts such as the case-control study being performed by the European Community, Sasakawa Memorial Health Foundation and the USA, with similar questionnaires being sent to the same children. So in order to avoid repetition and duplication, and also to increase the quality of the research, it is essential to have an international framework. I would like to use this time for discussion mainly on this international framework, and I invite your comments on this topic.

Pavel V. Ramzaev

Institute of Radiation Hygiene, St. Petersburg, Russian Federation

Three years after the Three Mile Island accident in the USA in 1979, the morbidity of malignant tumors increased 2-fold among people living at a distance 0.6 km from the accident site in comparison to people living at a 12.0 km distance. Recently the first committee of the International Commission on Radiological Protection discussed this phenomenon, and it was the opinion of the American scientists and myself that it was a result of the improved diagnostics, since more attention is paid to the population in the adjacent areas (*Am J Publ Health* 1991;81:719—724). But the opinion was also expressed that it was the result of psychological stress. In the Bryansk region we clearly observe two effects. The first is the effect of screening, and the second is the effect of radiation exposure. During the 2-year period when precise screening was performed in the Bryansk region by local physicians and our colleagues from Moscow, the morbidity increased by five or six times, but after that the rate of morbidity decreased to a level similar to that in clean territories because less attention was paid to the territory.

Also, there is a stable growth in both contaminated and noncontaminated areas. Starting from the year 1992—1993, an increase of radiation-induced childhood thyroid cancer appeared. But the correlation factor is very low and is not associated with radiation exposure.

It is too early to draw conclusions. In a publication a year ago, chief Russian epidemiologist Yablokov stated that there was a 60% increase in mortality from AIDS in the USA as a result of Chernobyl cloud radiation. But the exposure was only 15 µSv, which shows that great care must be taken when publishing assessments. Thank you for your attention.

Shigenobu Nagataki

In September 1995, Dr Ramzaev visited Nagasaki and expressed the above opinion during our discussions. But in November the same year, Dr Tsyb reported an increase in thyroid cancer at a WHO conference. So I would like to ask Dr Tsyb for his comments and then Dr Likhtarev.

Anatoly F. Tsyb

Medical Radiological Research Center of RAMS, Obninsk, Russian Federation

Several projects are being implemented on thyroid diseases at present in the territory of the Russian Federation. We have the project that Prof Ivanov just presented. This is a joint project with the Sasakawa Meamorial Health Foundation. At the same time we have a project with the European Community under the auspices of Elisabeth Cardis. In addition, academician Vorobiev signed an agreement with the USA for a project that will be implemented mainly in the Bryansk region, and we have an international thyroid project that Russia hopes to promote under the auspices of WHO.

The project conducted with the Sasakawa Memorial Health Foundation aimed to determine radiation risks for thyroid cancer. But the project under the leadership of Elisabeth Cardis and Prof Ivanov concentrated on iodine deficiency and genetic vulnerability to thyroid cancer. These two projects therefore complement each other and could be implemented simultaneously and information could be exchanged bilaterally. We would both benefit from the project. I think that the project of Prof Pinchera under the auspices of the European Community is also in line with the other projects. So I do not see any problems here.

With regard to the data presented by Prof Ramzaev, I am very pleased that at last he recognized the fact that there is a radiation-induced increase of cancer in children. It is the first time for me to hear a member of the international committee and a world-known scientist acknowledge that radiation-induced cancers appeared in children. I am sure that in all regions there is the same picture of an increase of radiation-induced cancers. Now it is necessary to determine the exposure dose.

Ilya A. Likhtarev

Scientific Centre for Radiation Medicine, Kiev, Ukraine

If we look at the world literature in the field of radioepidemiology, we see that scientists are divided into two unequal groups. The first group includes those who are working hard on the problem of radiation-induced thyroid cancer, and the other group is the group of people who doubt the results. I would like to dwell on two of the reasons for these doubts. Prof Ramzaev showed the increase in thyroid cancers, not among children but among adults, and did not mention the dose, and it was around this information that he started to build his argument. In the Three Mile Island accident, there may have been stresses and special screening procedures but there is no relation to radiation-induced childhood cancers. In Ukraine, Belarus and Russia, the spots of high contamination after the accident in 1986 are statistically correlated as places of residence corresponding to the highest incidence of childhood thyroid cancer. In 15% of exposed people the dose increased by 1.5 times, but for 85% of people it did not increase more than 5% for short-lived radioisotopes. In 1986 we reported the secret information about the projections on thyroid cancer in the Ukraine. The same people who agree with our data now did not believe the fact that we discovered the childhood thyroid cancers at that time. I agree with Prof Nagataki about the necessity to discuss our doubts and convictions. Thank you.

Anatoly K. Cheban

Scientific Centre for Radiation Medicine, Kiev, Ukraine

I would like to briefly express my opinion about the presentations made by the young and prospective scientists. And I would like to draw your attention to a study of children using modern methodology and standardizing. I belong to the older generation of scientists, and would like to give a piece of advice to the younger scientists. First, we have to take a serious approach to all patients with goiter, since we can easily miss a more serious disease during the screening. Second, we should also properly select the control methodology. Third, the young scientist should try to connect the pathology of the thyroid gland with the cesium contamination. Efforts should be directed to the analysis of the results, so as to determine the radiation doses, the nature of the radiation and its model for the thyroid gland. Among the results of the Chernobyl Sasakawa Project, the increase in thyroiditis in children residing in Prypat who received combined (internal and external) irradiation has been statistically proven.

We have rich experience in the study of children, and in our studies we should distinguish the children evacuated from the city of Prypat from other children in the population. Moreover, we have forgotten about one cohort which is scientifically very important, namely, that of the children evacuated from the 10-km zone of the Chernobyl Nuclear Power Plant on May 5–6. This is a high-risk group, and the children can be found and a representative group made for investigation. I would also separate another group of people who worked in the 30-km zone for 5 to 10 years. There are more than 2,000 people who fit into that category. In considering the establishment of further programs, it is very important to make the differentiation of the priority of the groups.

Shigenobu Nagataki

There are many important topics, but because of time limitation I ask Prof Pinchera to speak mainly on the subject of international cooperation.

Aldo Pinchera

University of Pisa, Pisa, Italy

This meeting is very appropriate and timely because, after 10 years of meetings in Geneva, Minsk and Vienna, this meeting in Kiev starts from established problems and looks to the future. There is no doubt that the increase in thyroid cancer among children after the Chernobyl accident is a fact, and this is a tremendously important issue for humanity. In order to clarify this and other problems, it is necessary that the foundation not only continues the work but also continues the cooperation. We have been concerned to date with the health of children, but today and tomorrow we will be concerned about the adults who were those children. The next 5-year meeting, I believe, will change its title from childhood thyroid cancer to adolescent thyroid cancer and even adult thyroid cancer. One measure is, of course, treatment. Treatment needs to be programmed and organized to ensure that there will be no lack of whatever is needed for the good health of the patients, including thyroxine and vitamin D for those who need them after surgery. But diagnosis is a prerequisite for good treatment, and identification of patients is a prerequisite for diagnosis. It is impossible in practice to screen the entire population. But from what we have learned, the subjects who were below 3 years of age at the time of the accident are at a high risk. So we have to focus on these high-risk groups in order to save time and money and to be more effective in programming appropriate treatment.

In the presentation made by Prof Nagataki, these points were summarized by the term international framework, information and cooperation. As pointed out by Prof Tsyb, there is no question that a very good interrelationship has been established among scientists beyond boundaries and frontiers. But this does not necessarily indicate that there is effective cooperation. In fact at many meetings we spend more time presenting data than discussing future programs just because of a lack of information.

In order to facilitate the exchange of information, WHO once proposed the launching of something like a newsletter, not for scientific purposes but for information on what is going on in different organizations. This would help to avoid redundancy in the projects being undertaken. Studies are tremendously important for treatment and these are based on data obtained from tissue specimens and blood samples. Medical science has made great progress, but there is still much to discover, particularly in connection with cancer problems. There should be some international organization, I believe, that would assist the centers in taking care of patients in the former Soviet Union countries, making them responsible, of course, for all activities, and that would help them to make information and material for joint studies available so that this information can be appropriately used for the treatment of the patients at this time and also for accumulation of new knowledge for the future.

Oncogenes are essential to cancer development. Several laboratories have studied oncogenes in relation to the Chernobyl accident. Preliminary data have been obtained, but no definite conclusions have been made so far. New discoveries will undoubtedly be made in the field of molecular biology in the next few years because the studies to date were based on knowledge acquired over the pathology needed for the patients themselves in terms of prognosis, but the new knowledge can only be used if the specimens are available to the international community in an appropriate manner. I would like to stress again that these cooperative initiatives are of major importance.

Shigenobu Nagataki

Prof Pinchera is asking the Sasakawa Memorial Health Foundation to keep screening children younger than 3 years old, and he has proposed the continuation of the screening, the publication of a newsletter and the establishment of a system to store important blood samples and tissue specimens for current and future studies. Are there any comments on the subject of international cooperation from Belarus?

Larisa N. Astakhova

Belmed Thyroid Diagnostic Clinic, Minsk, Belarus

I will comment only on a problem related to international cooperation in Belarus. The main part of every investigation, whatever the protocol, is the study of risks and pathogenesis of the unusual incidence of thyroid cancer in children. I believe that we have some protocols of different studies and that these should be continued with support from the Sasakawa Memorial Health Foundation because it is this kind of investigation that in the future will provide answers to many questions and, at the same time, give us bearings for future investigations. We are hoping that the future protocols of investigations in Belarus will be financed not only by the EU but also by the Sasakawa Memorial Health Foundation. These Sasakawa investigations should not interfere with the studies on the American side. We therefore have to coordinate all research together with the Sasakawa Memorial Health Foundation and within our republic and within the three republics as well.

Autoimmune thyroiditis is also of great interest to us because the incidence is dropping in comparison to the 1989–1990 Gomel figure (4-fold decrease), while an increase has been observed in other areas. What we need now is an epidemiological study on patients with autoimmune thyroiditis.

Shigenobu Nagataki

Do you have any remarks about the suggestion from Dr Pinchera concerning the storage of blood samples and tissue specimens?

Larisa N. Astakhova

I completely agree. A lot would be lost for science if this data bank were not formed. It should be established individually in Belarus, Ukraine and Russia, but the data should also be available to scientists throughout the world. The sample bank should be organized in a democratic way. We should determine what institute must have it available, although that does not mean that it would be an independent foundation. The data banks must be united and integrated. We have to think about how to manage and use the knowledge. Who has the right of access to this data bank in each of the countries, and when and how?

Yevgenia I. Stepanova

Scientific Centre for Radiation Medicine, Kiev, Ukraine

For 2 days we have listened to the interesting investigation results that contributed greatly to the understanding of the Chernobyl situation. The Chernobyl Sasakawa Project with other international studies has done a great deal, and it is now clear that the thyroid cancer problem in children is related to the ionizing radiation effects. Nevertheless, there are many aspects related to the health status in the evaluation of children and these present many uncertainties. And if the efforts of the international community focus on the thyroid cancer problem, the other health aspects in children would not be considered. I would like to emphasize that there are several cohorts of pediatric population whose health after Chernobyl is of particular scientific interest.

It was stated that it is very important to assess and run screening in children aged up to 3 years old at the time of the accident, including those prenatally affected. But no other problems were mentioned in reports here such as pathology growth in children born in families of participants in the cleaning up of activities, some of whom suffered acute radiation syndrome. Although we have followed up this cohort of children since 1987, we are now far from relating the problem to the radiation effects. But if we take into account the children born of irradiated parents and included in the register, a two times higher infant mortality is present. The scientists of Japan have tremendous experience but have still not found a close pathological interrelation between irradiated parents and their children. However, as time goes on new factors appear and new methods of investigation are developed. I believe the above problem can be given attention within Chernobyl Sasakawa Project framework.

Shigenobu Nagataki

Would anyone like to make a final remark?

Keith F. Baverstock

European Centre for Environment and Health, Rome, Italy

I would like first to reinforce what many other speakers have said about the need for cooperation. WHO held a meeting in Rome in 1993 to try to achieve this, but it has not been very successful. I do not suggest that we look back at the past, but rather that we look to the future and try to do it better from now on. One of the main interests, particularly among the international groups, is fundamental research. The need in the case of thyroid cancer is to determine the relationship between risk and ^{131}I doses. The subjects of our investigations are people, and we must put their needs in front of our scientific needs. The Sasakawa Memorial Health Foundation has demonstrated at this meeting that it is possible to combine humanitarian aid and science successfully, and the foundation is to be congratulated on that very significant achievement. One of the other conditions we have seen is iodine deficiency. This afflicts many of the population in the areas affected by the Chernobyl accident. It has three effects. It causes thyroid disease, it retards the cognitive development of children to the extent that a 10% prevalence of goiter seems to equate with a 10% reduction in intelligence quotient, and it probably severely exacerbates the development of radiation-induced thyroid cancer. We need to work on this problem as a very high priority. I would like to suggest that the International Thyroid Project be the organization to assist in bringing together the groups that are interested, to facilitate their efforts in getting together with their colleagues, and to ensure that there is no duplication and, equally important, that no important points are missed.

Shigenobu Nagataki

Thank you very much, Dr Baverstock. The final comments, Dr Cardis.

Elisabeth Cardis

International Agency for Research on Cancer, Lyon, France

I would like to make just a few comments about international collaboration. As you know, the IARC, the organization in which I work, does research on the causes and prevention of cancer, not on treatment; my comments therefore will cover research and public health aspects exclusively.

In terms of research I think it is very important to try to develop some coordination of work. There are many questions concerning the increase in thyroid cancer in the three countries after the Chernobyl accident and these questions may have very important implications for public health and radiation protection. Many of us have different interests in this matter, but there is room for all of us to work together to obtain answers to all these different questions. By working together we will avoid duplications, we will improve the quality of our studies, and very importantly, we will maximize the cost effectiveness of our work. We have to realize that not a single funding body has enough money to cover all of the costs of all of the studies which are needed.

Another extremely important area of collaboration is the establishment of a complete bank of information concerning all cases of thyroid cancer including tumor tissue, blood, information on clinical and pathological findings, as well as adequate information for linkage to other sources of information on these cases. Dr Astakhova mentioned that we have already lost some tissue for the future simply because there were so many collaborations that the tissue of some cases was used completely. It is very important to ensure that sections of the thyroid tumors are kept for future revisions of diagnosis and treatment of the patients, as well as for investigating new questions about the etiology of these cancers. This is an extremely important resource for treatment, diagnosis and research. This is an area where international collaboration is clearly needed, and where collaboration, especially in terms of funding, would be very helpful.

Thirdly, I would like to join Dr Pinchera in stressing the importance of the work carried out by the scientists in the three CIS countries and Japan under the Chernobyl Sasakawa Medical Cooperation Project. An extremely valuable bank of information has been assembled using a systematic protocol of investigation on the prevalence of a number of conditions in children in the three countries. It is important that the follow-up of examined children continue and that we can therefore continue to learn from the effects of the Chernobyl accident.

Finally, Dr Kreisel, the executive director of WHO, has asked me to offer that the planned international collaborations could, in the future, be carried out under the umbrella of WHO. As an international organization, WHO is well-placed to bring all concerned scientists and clinicians together so that our work in the future will be well coordinated and successful.

Shigenobu Nagataki

Thank you very much, Dr Cardis. It is now time to close the discussion.

Anatoly F. Tsyb

I would like to support the idea of Dr Cardis to create the data bank under the auspices of WHO. This could be a real step forward if we make such a decision. To date, a total of 144 cases of childhood thyroid cancer have been detected in Russia. We have counted the relative risk using the screening coefficient.

Shigenobu Nagataki

I would like to close the session on the thyroid. Thank you very much for your cooperation in the thyroid discussion.

Anatoly F. Tsyb

The work of the Fifth Chernobyl Sasakawa Medical Cooperation Symposium is completed. We thank all the organizers of the symposium and the speakers who summarized the work done in the five centers. Deep appreciation goes to all the organizers on the side of Sasakawa Memorial Health Foundation and scientific leaders in Japan and Moscow.

Appendix A
Statistical tables

A1-T01. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Boys. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	24	34	29	35	29	25	27	21	13	6	243
Mozir City	1		1	1	1	2	2				8
Dobrushskii R.	39	38	29	36	36	16	10	5	3	2	214
Vetkovskii R.											
Gomelskii R.	5	4	11	6	4	5	4	6	9	2	56
Loevskii R.					1		1				2
Braginskii R.	19	21	30	27	26	24	34	31	34	25	271
Checherskii R.											
Buda-Koshelevskii R.	12	10	20	14	10	13	12	15	10	11	127
Rechitskii R.	2	2	1	1	1				1		8
Hoynikskii R.											
Narovlyanskii R.			1			1					2
Kormyanskii R.			1		2						3
Rogachevskii R.											
Zlobinskii R.		1	3		1	3		2	3		13
Svetlogorskii R.	1		1								2
Kalinkovichskii R.						1	2		1		4
Mozirskii R.					1						1
Elskii R.											
Oktyabrskii R.		1	1								2
Petrikovskii R.	9	8	7	6	5	7	2	11	1	2	58
Lelchitskii R.	6	4	2	1	1	3	4				21
Zitkovichskii R.											
Total	118	123	137	127	118	100	98	91	75	48	1035

A1-T02. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Girls. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	22	20	28	36	43	37	34	26	23	9	278
Mozir City			1	2		1	1		1		6
Dobrushskii R.	51	27	39	38	29	23	15	10	7	5	244
Vetkovskii R.				1	1			1		1	4
Gomelskii R.	5	6		9	3	6	6	2	3		40
Loevskii R.						2	1				3
Braginskii R.	20	20	23	31	30	28	22	21	26	21	242
Checherskii R.											
Buda-Koshelevskii R.	11	15	17	15	17	13	13	13	21	18	153
Rechitskii R.	2	1	1		1		2		1	1	9
Hoynikskii R.				1		1				1	3
Narovlyanskii R.				1							1
Kormyanskii R.	1										1
Rogachevskii R.			1	1				1	1		4
Zlobinskii R.				1		2			1	3	7
Svetlogorskii R.									1		1
Kalinkovichskii R.	1					1	1		1		4
Mozirskii R.					1						1
Elskii R.											
Oktyabrskii R.											
Petrikovskii R.	20	10	15	5	9	5	15	3	6	8	96
Lelchitskii R.	8	4	2	5	1	4	4	2	1	1	32
Zitkovichskii R.											
Total	141	103	127	146	135	123	114	79	93	68	1129

A1-T03. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Boys. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	4	7	3	7	7	13	6	3	4		54
Mozir City			1	1	1		1	1			5
Dobrushskii R.	41	45	41	31	33	35	35	31	15	2	309
Vetkovskii R.											
Gomelskii R.	53	62	64	67	70	68	62	50	53	33	582
Loevskii R.	57	34	33	22	20	18	23	14	10	6	237
Braginskii R.						1					1
Checherskii R.	1		2	5	2	2	6	2	8	3	31
Buda-Koshelevskii R.		1				1					2
Rechitskii R.			1		1		1				3
Hoynikskii R.	10	30	22	20	24	5	6	15	16	8	156
Narovlyanskii R.											
Kormyanskii R.	12	7	10	10	1	1	2	3			46
Rogachevskii R.				1				1			2
Zlobinskii R.	1			1			1	1			4
Svetlogorskii R.					1	1					2
Kalinkovichskii R.			1					1			2
Mozirskii R.											
Elskii R.	24	23	21	10	12	10	10	8	8	11	137
Oktyabrskii R.											
Petrikovskii R.											
Lelchitskii R.											
Zitkovichskii R.											
Total	203	209	199	175	172	155	153	130	114	63	1573

A1-T04. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Girls. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	4	6	7	7	14	6	5	6	1		56
Mozir City		1	1								2
Dobrushskii R.	54	36	36	37	52	46	34	29	21	9	354
Vetkovskii R.											
Gomelskii R.	49	71	69	73	70	79	67	57	71	41	647
Loevskii R.	33	22	24	17	19	22	35	12	11	4	199
Braginskii R.						1					1
Checherskii R.	3	1	4	8	6	4	4	5	4	4	43
Buda-Koshelevskii R.	1										1
Rechitskii R.		1				1	1	1			4
Hoynikskii R.	8	15	10	28	16	5	9	23	22	7	143
Narovlyanskii R.											
Kormyanskii R.	15	11	6	7	3	2	1		1	1	47
Rogachevskii R.		1			1						2
Zlobinskii R.	1			1	2						4
Svetlogorskii R.					1		1				2
Kalinkovichskii R.					1		2	1	2		6
Mozirskii R.			2				1				3
Elskii R.	31	24	19	23	17	15	19	17	16	10	191
Oktyabrskii R.							1				1
Petrikovskii R.				1					1		2
Lelchitskii R.											
Zitkovichskii R.											
Total	199	189	178	202	202	181	180	151	150	76	1708

A1-T05. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Boys. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	121	114	104	52	52	39	44	42	27	14	609
Mozir City	3	3	3	3	5	1	1				19
Dobrushskii R.	1			3	2	3	2	1		5	17
Vetkovskii R.	2	2	3	2	1	1	3	1		2	17
Gomelskii R.	136	132	102	93	77	54	60	55	27	14	750
Loevskii R.	3	6	2	7	8	4	4	7	3	2	46
Braginskii R.	5	2		3	2						12
Checherskii R.						1		1	1		3
Buda-Koshelevskii R.	4	4	3	1	4	3	1	4		1	25
Rechitskii R.	1	2	5	2	2	1	2	3	1	9	28
Hoynikskii R.		1		1		1	2	1		2	8
Narovlyanskii R.											
Kormyanskii R.			1					1		2	4
Rogachevskii R.		1	3	1	1		1			1	8
Zlobinskii R.	1	2	1	1	3			1		1	10
Svetlogorskii R.	1	2		2	2	3	2	1		3	16
Kalinkovichskii R.		4		2	3	3	1				13
Mozirskii R.	1						2				3
Elskii R.						1	1				2
Oktyabrskii R.											
Petrikovskii R.				4		2		1	1		8
Lelchitskii R.	1	1	1	1							4
Zitkovichskii R.										1	1
Total	280	276	228	178	162	117	126	119	60	57	1603

A1-T06. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Girls. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	125	115	99	63	89	66	45	34	22	14	672
Mozir City	1	3	8	5	4	4	3	1			29
Dobrushskii R.	1	1	2	1	3	2	3		2	4	19
Vetkovskii R.	2		1	3	2	2		1		1	12
Gomelskii R.	119	153	103	83	82	66	74	57	30	23	790
Loevskii R.	5	5	3	9	9	7	6	6	2		52
Braginskii R.	1	2	2		1		2	2	2		12
Checherskii R.	1									2	3
Buda-Koshelevskii R.	3	4	3	2	3	7	6	5	2	2	37
Rechitskii R.	1	3	5	2	5	3	7		1	1	28
Hoynikskii R.	1				1					1	3
Narovlyanskii R.											
Kormyanskii R.				1		1		2		2	6
Rogachevskii R.			1	3	2	1		2			9
Zlobinskii R.	4	4	4	3		4	1	2		2	24
Svetlogorskii R.	1	2		1	2	2	5		1	9	23
Kalinkovichskii R.	2	1		1	3	2	1	2		1	13
Mozirskii R.	1	2		1	2						6
Elskii R.	1		1				1				3
Oktyabrskii R.	1	1		2			2		1	1	8
Petrikovskii R.		1	1					1		3	6
Lelchitskii R.	1	2	2	2	1	5		1		4	18
Zitkovichskii R.	1										1
Total	272	299	235	182	209	172	156	116	63	70	1774

A1-T07. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Boys. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	57	50	41	31	56	52	39	16	3	2	347
Mozir City		1									1
Dobrushskii R.	1	2		1		1					5
Vetkovskii R.	2		2	2	2						8
Gomelskii R.	141	124	132	169	122	145	124	46	3		1006
Loevskii R.	1	2	2		2	3					10
Braginskii R.						1					1
Checherskii R.							1				1
Buda-Koshelevskii R.	2		1		1	2		1			7
Rechitskii R.	116	128	125	99	111	87	67	30	6		769
Hoynikskii R.	2						2		3	1	8
Narovlyanskii R.											
Kormyanskii R.					1			1			2
Rogachevskii R.	45	42	49	41	42	34	31	16	1		301
Zlobinskii R.	31	28	30	36	26	25	10	3		1	190
Svetlogorskii R.	1			1		2					4
Kalinkovichskii R.					1						1
Mozirskii R.											
Elskii R.		1			1	1					3
Oktyabrskii R.	5			2	1						8
Petrikovskii R.		2		1			1		2		6
Lelchitskii R.	1										1
Zitkovichskii R.											
Total	405	380	382	383	366	353	275	113	18	4	2679

A1-T08. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Girls. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	70	49	57	38	50	58	40	11	8	1	382
Mozir City											
Dobrushskii R.	2		1		3		2	1			9
Vetkovskii R.	1	4	2		2	3					12
Gomelskii R.	126	126	141	147	129	158	116	40			983
Loevskii R.	2	3	2	3		2			3		15
Braginskii R.	1	2				1	2				6
Checherskii R.				1		1					2
Buda-Koshelevskii R.	2	2	2	1	2	1		1			11
Rechitskii R.	112	105	120	101	109	92	90	46	5		780
Hoynikskii R.		1	1	3			2	2	1		10
Narovlyanskii R.											
Kormyanskii R.		3	1		1						5
Rogachevskii R.	51	53	52	42	46	50	30	13	7		344
Zlobinskii R.	46	39	39	34	27	30	23	7	1		246
Svetlogorskii R.		1				2	1				4
Kalinkovichskii R.											
Mozirskii R.			2			1					3
Elskii R.			1	1	2		1	2			7
Oktyabrskii R.			1	3	3	1		1			9
Petrikovskii R.	1			2	1						4
Lelchitskii R.	2			1	1	2	1				7
Zitkovichskii R.					1						1
Total	416	388	422	377	377	402	308	124	25	1	2840

A1-T09. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Boys. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	58	54	58	51	50	25	6	2	1		305
Mozir City	1		2	8	4	2					17
Dobrushskii R.	2	3	5	3	2	2					17
Vetkovskii R.		2	3				1				6
Gomelskii R.	145	162	134	146	98	89	59	5	3		841
Loevskii R.	2	2	1	3	2	1	2				13
Braginskii R.											
Checherskii R.	1			3		1	1				6
Buda-Koshelevskii R.	36	37	23	24	18	21	8	3			170
Rechitskii R.	8	4	3	5	7	1	1			1	30
Hoynikskii R.	54	66	57	63	63	61	32	10			406
Narovlyanskii R.		1									1
Kormyanskii R.	6	12	6	5	6	2					37
Rogachevskii R.		1	2	2	1	1					7
Zlobinskii R.				1							1
Svetlogorskii R.	1	3		2	2		1				9
Kalinkovichskii R.	7	8	6	6	2	4					33
Mozirskii R.		1	1	1	1						4
Elskii R.	4	4		1	1						10
Oktyabrskii R.	1	2		1	1		1				6
Petrikovskii R.	3		3	2	1						9
Lelchitskii R.		2	7	6	6	4	5	1			31
Zitkovichskii R.	2			1	1						4
Total	331	364	311	334	266	214	117	21	4	1	1963

A1-T10. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Girls. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	68	76	72	74	60	33	9	3			395
Mozir City		3	1	4	5	3					16
Dobrushskii R.	2	2	2	5	5	2	1	1			20
Vetkovskii R.	1	1	1	2	2		1	1			9
Gomelskii R.	140	135	153	140	104	72	66	7	1		818
Loevskii R.	3	3	1	3	1	2	2		1		16
Braginskii R.						2					2
Checherskii R.		3	2	4	3	1		1			14
Buda-Koshelevskii R.	40	42	26	32	30	22	11	5	1		209
Rechitskii R.	12	3	8	6	5	2	1				37
Hoynikskii R.	65	55	45	41	47	53	36	12			354
Narovlyanskii R.											
Kormyanskii R.	8	9	4	6	7	4					38
Rogachevskii R.	1	4	2	2	2	2	1				14
Zlobinskii R.	1	6	5		4	1					17
Svetlogorskii R.	6	2	6	5	4	1					24
Kalinkovichskii R.	7	3	5	1	4	2					22
Mozirskii R.	3	2	1	1							7
Elskii R.	1	3	1		1	2	1				9
Oktyabrskii R.	1	1	2	1	1						6
Petrikovskii R.			3	2	2			1			8
Lelchitskii R.	3	3	5	4	9	9	8	3			44
Zitkovichskii R.		3	2	3	1	2					11
Total	362	359	347	336	297	215	137	34	3		2090

A1-T11. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Boys. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	15	7	6	7		2	2	1			40
Mozir City	1	1	1		2						5
Dobrushskii R.											
Vetkovskii R.		1	1								2
Gomelskii R.	103	80	92	97	88	57	5				522
Loevskii R.				1							1
Braginskii R.											
Checherskii R.											
Buda-Koshelevskii R.	2	2			1						5
Rechitskii R.	7	8	8	7	11	5	1				47
Hoynikskii R.				2							2
Narovlyanskii R.											
Kormyanskii R.											
Rogachevskii R.											
Zlobinskii R.											
Svetlogorskii R.	1	2		2	1						6
Kalinkovichskii R.											
Mozirskii R.											
Elskii R.						1					1
Oktyabrskii R.											
Petrikovskii R.							1				1
Lelchitskii R.											
Zitkovichskii R.											
Total	129	101	108	116	103	65	9	1			632

A1-T12. Number of examined children by place of residence and age at the time of the accident. Gomel region, Belarus. Girls. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Gomel City	6	16	9	7	14	7	3	2			64
Mozir City	2	1	2	3	1		1				10
Dobrushskii R.											
Vetkovskii R.				1	1	1					3
Gomelskii R.	89	79	70	95	97	59	3				492
Loevskii R.											
Braginskii R.		1									1
Checherskii R.											
Buda-Koshelevskii R.		2									2
Rechitskii R.	10	9	6	7	10	5	1	4			52
Hoynikskii R.											
Narovlyanskii R.											
Kormyanskii R.				1							1
Rogachevskii R.											
Zlobinskii R.	1										1
Svetlogorskii R.				2		1					3
Kalinkovichskii R.											
Mozirskii R.					1						1
Elskii R.		1									1
Oktyabrskii R.					1						1
Petrikovskii R.	1										1
Lelchitskii R.				1							1
Zitkovichskii R.											
Total	109	109	87	117	125	73	8	6			634

A1-T13. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Boys. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	18	35	4				3	5	1		66
Bobruisk City											
Hotimskii R.											
Klimovichskii R.	6	7	8	7	8	5	1	2	1		45
Kostyukovichskii R.											
Mstislavskii R.											
Krichevskii R.	27	39	25	22	15	3	1				132
Cherikovskii R.											
Krasnopolskii R.											
Goretskii R.											
Chausskii R.	20	14	14	17	6	5	1				77
Slavgorodskii R.	19	16	21	15	23	12	16	15	23	16	176
Shklovskii R.											
Mogilevskii R.		1					1				2
Bykhovskii R.	50	39	15	17	10	4	1	2			138
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											
Total	140	151	87	78	62	29	24	24	25	16	636

A1-T14. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Girls. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	19	39	4		1		1	2	1		67
Bobruisk City											
Hotimskii R.											
Klimovichskii R.	6	5	2	9	6	8	2	3			41
Kostyukovichskii R.											
Mstislavskii R.											
Krichevskii R.	36	31	25	23	13	15	1				144
Cherikovskii R.											
Krasnopolskii R.											
Goretskii R.											
Chausskii R.	18	11	11	16	12	6	1			1	76
Slavgorodskii R.	16	22	21	16	18	18	22	22	26	12	193
Shklovskii R.											
Mogilevskii R.											
Bykhovskii R.	55	24	26	25	13	9	6	1			159
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											
Total	150	132	89	89	63	56	33	28	27	13	680

A1-T15. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Boys. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	50	65	122	84	81	111	83	76	80	48	800
Bobruisk City											
Hotimskii R.						1					1
Klimovichskii R.											
Kostyukovichskii R.	26	6	5	9	9	13	28	32	7	1	136
Mstislavskii R.											
Krichevskii R.											
Cherikovskii R.	14	11		11	21	18	19	11			105
Krasnopolskii R.	18	7	2	1	1	1		2			32
Goretskii R.											
Chausskii R.	48	25	22	18	27	20	15	15	21	14	225
Slavgorodskii R.											
Shklovskii R.											
Mogilevskii R.	70	108	102	108	119	111	136	120	70	44	988
Bykhovskii R.								1			1
Kruglianskii R.											
Belynichskii R.			1								1
Klichevskii R.	6	5	6	9	8	11	5	6	4	1	61
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											
Total	232	227	260	240	266	286	286	263	182	108	2350

A1-T16. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Girls. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	38	67	128	97	97	114	92	80	101	53	867
Bobruisk City											
Hotimskii R.											
Klimovichskii R.											
Kostyukovichskii R.	20	3	12	8	15	18	40	25	11	5	157
Mstislavskii R.											
Krichevskii R.											
Cherikovskii R.	20	7	1	8	19	20	32	10			117
Krasnopolskii R.	19	6	1	2			1	1		1	31
Goretskii R.	1										1
Chausskii R.	45	27	19	28	21	31	31	18	22	14	256
Slavgorodskii R.											
Shklovskii R.											
Mogilevskii R.	62	87	92	110	109	123	112	106	87	71	959
Bykhovskii R.											
Kruglianskii R.											
Belynichskii R.		1									1
Klichevskii R.	6	4	5	8	6	9	3	5	4	3	53
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.						1					1
Glusskii R.											
Total	211	202	258	261	267	316	311	245	225	147	2443

A1-T17. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Boys. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	313	170	163	157	190	226	223	160	75	55	1732
Bobruisk City	2	2		1	1						6
Hotimskii R.	3	2	2	4	1		1	1			14
Klimovichskii R.					1						1
Kostyukovichskii R.	7		6	3	6	5	11	14	5	4	61
Mstislavskii R.											
Krichevskii R.			1								1
Cherikovskii R.	3	1	3	4	4	4	5	9	7		40
Krasnopolskii R.	4	6	23	35	8	13	16	8	10	3	126
Goretskii R.						1					1
Chausskii R.	55	66	53	75	48	28	32	4	3		364
Slavgorodskii R.											
Shklovskii R.											
Mogilevskii R.	10	10	22	14	13	11	12	9	12	4	117
Bykhovskii R.	27	23	32	81	76	70	70	69	83	41	572
Kruglianskii R.											
Belynichskii R.							1				1
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.	1	1		1	1		1				5
Osipovichskii R.											
Glusskii R.	3	2	5	2	9	1	2	2	1	1	28
Total	428	283	310	377	358	359	374	276	196	108	3069

A1-T18. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Girls. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	247	165	157	174	205	233	222	182	124	86	1795
Bobruisk City	1	1									2
Hotimskii R.		3	1	4	2		3				13
Klimovichskii R.											
Kostyukovichskii R.	3	5	2	4	17	13	12	10	2	6	74
Mstislavskii R.											
Krichevskii R.					1		1	1			3
Cherikovskii R.	3	7	3	4	6	10	10	8	2	1	54
Krasnopolskii R.	5	11	32	30	15	10	9	11	8	2	133
Goretskii R.							1	1			2
Chausskii R.	65	61	46	87	52	42	39	1	1		394
Slavgorodskii R.											
Shklovskii R.											
Mogilevskii R.	14	12	16	11	5	11	9	10	10	16	114
Bykhovskii R.	31	20	32	71	85	74	60	63	71	53	560
Kruglianskii R.											
Belynichskii R.							1				1
Klichevskii R.			1								1
Kirovskii R.											
Bobruiskii R.	1	1	1	3	4	3		1			14
Osipovichskii R.											
Glusskii R.	2	1	1	2	6	5	4	1	2		24
Total	372	287	292	390	398	401	371	289	220	164	3184

A1-T19. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Boys. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	238	264	195	176	158	123	151	87	53	24	1469
Bobruisk City											
Hotimskii R.	5	14	11	3	4	3					40
Klimovichskii R.	12	10	16	18	17	23	2	1			99
Kostyukovichskii R.	4	4	9	7	11	5	6	4			50
Mstislavskii R.											
Krichevskii R.						1					1
Cherikovskii R.	40	50	48	36	24	17	18	15	13	3	264
Krasnopolskii R.	35	41	40	49	29	29	45	20	17	3	308
Goretskii R.											
Chausskii R.	13	25	13	22	22	22	26	7	2		152
Slavgorodskii R.				1		1		1	1		4
Shklovskii R.			1								1
Mogilevskii R.	14	16	12	11	17	13	11	7	3		104
Bykhovskii R.	41	15	27	37	38	39	23	16	12	3	251
Kruglianskii R.						1					1
Belynichskii R.		1									1
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.								1		1	2
Glusskii R.			1						1		2
Total	402	440	373	360	320	277	282	159	102	34	2749

A1-T20. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Girls. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	239	276	216	184	156	134	111	118	89	27	1550
Bobruisk City											
Hotimskii R.	2	4	5	2		4		1			18
Klimovichskii R.	7	7	20	18	7	18			1		78
Kostyukovichskii R.	3	1	9	7	12	3	5	4	7		51
Mstislavskii R.											
Krichevskii R.											
Cherikovskii R.	44	67	38	42	31	13	13	15	16	2	281
Krasnopolskii R.	27	37	30	24	37	39	28	22	12	3	259
Goretskii R.											
Chausskii R.	15	19	21	18	20	26	18	12	1		150
Slavgorodskii R.				2	1	4	4				11
Shklovskii R.		1									1
Mogilevskii R.	17	8	18	14	10	17	9	11	1		105
Bykhovskii R.	41	31	35	45	56	49	23	22	19	7	328
Kruglianskii R.											
Belynichskii R.				1		1					2
Klichevskii R.											
Kirovskii R.				1							1
Bobruiskii R.	1										1
Osipovichskii R.											
Glusskii R.											
Total	396	451	392	358	330	308	211	205	146	39	2836

A1-T21. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Boys. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	144	150	160	151	139	154	79	16	5		998
Bobruisk City											
Hotimskii R.											
Klimovichskii R.	19	16	21	22	23	18	5	7		1	132
Kostyukovichskii R.			1	2							3
Mstislavskii R.			1								1
Krichevskii R.	2	1			4	3					10
Cherikovskii R.	5	4			1			1			11
Krasnopolskii R.	45	33	38	41	30	25	14	13			239
Goretskii R.		2	1	3	1	4					11
Chausskii R.	11	12	18	19	13	18	16	7	2		116
Slavgorodskii R.	1	5	4	1	5						16
Shklovskii R.				1							1
Mogilevskii R.	29	31	27	24	17	13	5	2	1		149
Bykhovskii R.	18	16	22	33	37	18	19	13	9		185
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.		1									1
Bobruiskii R.		1		1							2
Osipovichskii R.			1								1
Glusskii R.											
Total	274	272	294	298	270	253	138	59	17	1	1876

A1-T22. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Girls. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	139	148	165	172	176	159	100	48	13	3	1123
Bobruisk City			2								2
Hotimskii R.											
Klimovichskii R.	19	12	18	21	32	30	15	5			152
Kostyukovichskii R.					1	1	1				3
Mstislavskii R.											
Krichevskii R.	1			1	4	5				1	12
Cherikovskii R.	4	4		2	4						14
Krasnopolskii R.	57	31	36	28	41	11	16	10	3		233
Goretskii R.	2	6	2	4	1	1	2	1			19
Chausskii R.	13	13	18	18	17	18	15	5	3		120
Slavgorodskii R.	2	2	6	2		1					13
Shklovskii R.	1	2	1		2						6
Mogilevskii R.	28	24	21	24	20	7	2	2			128
Bykhovskii R.	23	16	23	30	27	19	21	13	9		181
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.						1					1
Bobruiskii R.											
Osipovichskii R.			1			1					2
Glusskii R.								1			1
Total	289	258	293	302	325	254	172	85	28	4	2010

A1-T23. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Boys. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	71	62	65	71	73	88	55	18	1	1	505
Bobruisk City											
Hotimskii R.											
Klimovichskii R.											
Kostyukovichskii R.											
Mstislavskii R.											
Krichevskii R.											
Cherikovskii R.	8	9	3	4	4	4	2	2			36
Krasnopolskii R.	13	14	15	14	30	41	28	13			168
Goretskii R.											
Chausskii R.											
Slavgorodskii R.	14	13	20	19	11	5					82
Shklovskii R.											
Mogilevskii R.	31	17	23	25	22	23	16	4			161
Bykhovskii R.	3	2	4	4	6	5	5	2			31
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											
Total	140	117	130	137	146	166	106	39	1	1	983

A1-T24. Number of examined children by place of residence and age at the time of the accident. Mogilev region, Belarus. Girls. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Mogilev City	60	65	63	60	73	54	37	13			425
Bobruisk City											
Hotimskii R.											
Klimovichskii R.											
Kostyukovichskii R.											
Mstislavskii R.											
Krichevskii R.											
Cherikovskii R.	1	7	5	4	7	11	4	2			41
Krasnopolskii R.	11	14	21	17	43	40	33	19			198
Goretskii R.											
Chausskii R.		1		2							3
Slavgorodskii R.	19	14	13	13	10	8					77
Shklovskii R.											
Mogilevskii R.	23	39	23	33	17	25	15	6			181
Bykhovskii R.	4	3	5	6	11	7	3				39
Kruglianskii R.							1				1
Belynichskii R.											
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											
Total	118	143	130	135	161	145	93	40			965

A1-T25. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Boys. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	125	132	48	15	8	10	13	8	8	4	371
Gordeevskii R.											
Klintsovskii R.	1				1						2
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.											
Total	126	132	48	15	9	10	13	8	8	4	373

A1-T26. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Girls. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	126	94	35	17	7	16	12	10	9	4	330
Gordeevskii R.		1									1
Klintsovskii R.	1										1
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.											
Total	127	95	35	17	7	16	12	10	9	4	332

A1-T27. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Boys. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	72	102	150	134	145	115	110	104	197	165	1294
Gordeevskii R.											
Klintsovskii R.	21	22	9	13	10	5	14	15	4	3	116
Novozybkovskii R.		1									1
Zlynkovskii R.											
Krasnogorskii R.											
Total	93	125	159	147	155	120	124	119	201	168	1411

A1-T28. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Girls. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	79	109	116	148	134	102	114	129	223	272	1426
Gordeevskii R.											
Klintsovskii R.	17	16	18	15	13	12	9	9	11	4	124
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.											
Total	96	125	134	163	147	114	123	138	234	276	1550

A1-T29. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Boys. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	235	321	374	352	355	377	428	327	157	30	2956
Gordeevskii R.											
Klintsovskii R.	45	44	49	48	48	54	60	35	39	23	445
Novozybkovskii R.	120	119	117	108	111	114	126	170	25	9	919
Zlynkovskii R.											
Krasnogorskii R.											
Total	400	484	540	508	514	545	614	432	221	62	4320

A1-T30. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Girls. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	224	301	340	388	373	377	386	325	167	42	2923
Gordeevskii R.											
Klintsovskii R.	44	41	42	54	42	48	39	40	28	16	394
Novozybkovskii R.	115	97	130	106	124	103	103	71	42	18	909
Zlynkovskii R.											
Krasnogorskii R.											
Total	383	439	512	548	539	528	528	436	237	76	4226

A1-T31. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Boys. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	146	106	82	83	59	66	64	27	4	2	639
Gordeevskii R.	67	81	93	92	104	82	66	41	12	2	640
Klintsovskii R.									1		1
Novozybkovskii R.	62	47	53	52	70	60	56	46	28	16	490
Zlynkovskii R.	73	89	102	94	98	98	93	68	70	32	817
Krasnogorskii R.										1	1
Total	348	323	330	321	331	306	279	182	115	53	2588

A1-T32. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Girls. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	122	90	46	66	74	43	53	20	4	2	520
Gordeevskii R.	73	83	92	80	72	82	82	68	27	2	661
Klintsovskii R.		1	1	1		2		1	4	1	11
Novozybkovskii R.	60	53	55	61	55	49	63	46	42	16	500
Zlynkovskii R.	106	90	113	93	111	96	80	78	78	39	884
Krasnogorskii R.											
Total	361	317	307	301	312	272	278	213	155	60	2576

A1-T33. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Boys. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	29	33	41	41	44	41	42	34	48	10	363
Gordeevskii R.	5	2	6	6	2	5	2				28
Klintsovskii R.	12	7	10	7	10	12	9	4	4		75
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.	65	47	58	46	58	30	40	23	8		375
Total	111	89	115	100	114	88	93	61	60	10	841

A1-T34. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Girls. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	36	34	27	31	26	51	63	81	101	68	518
Gordeevskii R.	12	3	7	1		5	2	1			31
Klintsovskii R.	2	10	2	11	6	12	12	10	9	3	77
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.	69	42	48	54	65	62	56	31	21		448
Total	119	89	84	97	97	130	133	123	131	71	1074

A1-T35. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Boys. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	8	7	8	6	3	2	1				35
Gordeevskii R.											
Klintsovskii R.			1		1		1				3
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.	70	54	84	98	79	34	2				421
Total	78	61	93	104	83	36	4				459

A1-T36. Number of examined children by place of residence and age at the time of the accident. Bryansk region, Russian Federation. Girls. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Klincy City	10	4	6	4	4	2	2				32
Gordeevskii R.											
Klintsovskii R.				2	1						3
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.	77	72	73	72	65	19	4				382
Total	87	76	79	78	70	21	6				417

A1-T37. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Boys. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	1										1
Polesskii R.	13	23	18	25	20	3	3	2		1	108
Ivankovskii R.	52	49	46	46	34	33	19	8	4	2	293
Borodyanskii R.	16	9	16	15	12	6	1				75
Vishgorodskii R.	5	5	4	10	7	19	21	12	7	6	96
Irpenskii R.				1							1
K. Svyatoshinskii R.											
Makarovskii R.	16	15	25	21	13	16	6	4	1	1	118
Brovarskii R.											
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.											
Obukhovskii R.											
Belotserkovskii R.											
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											
Total	103	101	109	118	86	77	50	26	12	10	692

A1-T38. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Girls. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City			1	1							2
Polesskii R.	9	23	34	28	16	4	1		4	1	120
Ivankovskii R.	49	40	29	46	49	32	11	4	4	3	267
Borodyanskii R.	15	13	11	21	15	11			1		87
Vishgorodskii R.	4	10	11	8	14	13	18	12	11	5	106
Irpenskii R.											
K. Svyatoshinskii R.											
Makarovskii R.	19	19	26	19	21	19	8	4	1	1	137
Brovarskii R.											
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.											
Obukhovskii R.											
Belotserkovskii R.											
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											
Total	96	105	112	123	115	79	38	20	21	10	719

A1-T39. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Boys. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City		3	2		2	1	2			1	11
Polesskii R.	20	25	39	31	45	25	31	26	24	17	283
Ivankovskii R.	15	15	13	14	15	6	4	6	7	6	101
Borodyanskii R.	22	11	11	6	16	12	6	5	1	2	92
Vishgorodskii R.	27	22	21	29	11	17	24	19	15	5	190
Irpenskii R.	43	21	17	14	9	8	12	4	7	3	138
K. Svyatoshinskii R.			1								1
Makarovskii R.	24	32	19	17	18	13	11	12	8	1	155
Brovarskii R.											
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.											
Obukhovskii R.											
Belotserkovskii R.											
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											
Total	151	129	123	111	116	82	90	72	62	35	971

A1-T40. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Girls. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	1		2	2	3	2	2		2	1	15
Polesskii R.	21	26	27	41	37	31	38	31	16	16	284
Ivankovskii R.	19	19	18	14	7	9	13	9	5	2	115
Borodyanskii R.	25	17	7	17	6	13	11	4	4	2	106
Vishgorodskii R.	25	19	22	17	25	16	28	24	14	8	198
Irpenskii R.	35	33	13	17	16	27	29	13	15	5	203
K. Svyatoshinskii R.					1			1	1		3
Makarovskii R.	19	18	29	20	26	13	11	17	10	4	167
Brovarskii R.											
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.											
Obukhovskii R.											
Belotserkovskii R.	1										1
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.								1			1
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											
Total	146	132	118	128	121	111	132	100	67	38	1093

A1-T41. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Boys. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	25	14	25	20	21	18	19	8	9	2	161
Polesskii R.	6	9									15
Ivankovskii R.								1			1
Borodyanskii R.						1	1			1	3
Vishgorodskii R.	43	14	12	14	15	12	31	40	21	22	224
Irpenskii R.	59	29	36	27	13	28	20	22	6	2	242
K. Svyatoshinskii R.	59	31	24	40	26	29	39	150	79	19	496
Makarovskii R.	4	13	12	18	19	16	16	14	17	4	133
Brovarskii R.	42	43	65	53	65	64	66	54	19	15	486
Vasilkovskii R.	39	32	31	38	24	28	27	21	13	11	264
Fastovskii R.	15	24	26	25	30	31	30	30	6	2	219
Zgurovskii R.						1					1
Baryshevskii R.	11	18	17	9	12	15	10	4	1		97
Borispolskii R.	16	22	19	19	11	20	18	20	8		153
Obukhovskii R.	36	45	38	33	37	46	33	32	19	12	331
Belotserkovskii R.	13	15	22	32	25	21	27	24	8	1	188
Skvirskii R.								1			1
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.	35	38	45	55	44	22	43	22	29	17	350
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.			1								1
Boguslavskii R.	1										1
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											
Total	404	347	373	383	342	352	380	443	235	108	3367

A1-T42. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Girls. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	31	27	29	24	21	15	28	28	12	11	226
Polesskii R.	5	3									8
Ivankovskii R.							1		2		3
Borodyanskii R.						1				1	2
Vishgorodskii R.	36	15	17	11	12	20	33	34	27	37	242
Irpenskii R.	50	32	30	24	23	16	25	11	7	4	222
K. Svyatoshinskii R.	42	44	32	39	48	37	42	113	100	18	515
Makarovskii R.	13	11	27	19	21	30	29	31	21	7	209
Brovarskii R.	48	52	54	62	49	62	57	58	33	25	500
Vasilkovskii R.	30	35	36	24	34	36	35	27	23	16	296
Fastovskii R.	15	30	50	50	47	60	65	46	18	12	393
Zgurovskii R.			1								1
Baryshevskii R.	4	13	7	3	15	14	12	1	1	1	71
Borispolskii R.	15	17	13	18	11	11	21	15	8	4	133
Obukhovskii R.	37	42	28	36	35	35	21	39	36	13	322
Belotserkovskii R.	29	36	24	15	25	24	18	15	10	1	197
Skvirskii R.				1		1	1				3
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.	31	38	56	49	54	61	49	40	38	26	442
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.	1										1
Boguslavskii R.											
Taraschanskii R.							1				1
Stavischenskii R.									1		1
Tetievskii R.										1	1
Total	387	395	404	375	395	423	438	458	337	177	3789

A1-T43. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Boys. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	26	15	23	21	19	11	12	4	3	1	135
Polesskii R.											
Ivankovskii R.	19	17	13	15	25	36	57	39	13	1	235
Borodyanskii R.	112	127	143	115	94	89	60	33	10		783
Vishgorodskii R.	104	98	122	101	96	91	95	63	47	19	836
Irpenskii R.	57	45	56	79	86	119	98	51	26	5	622
K. Svyatoshinskii R.	20	27	11	36	39	11	29	15		1	189
Makarovskii R.											
Brovarskii R.	37	38	44	38	26	23	14	18	4	6	248
Vasilkovskii R.						1					1
Fastovskii R.		2	2	2	1	2	1				10
Zgurovskii R.											
Baryshevskii R.	4	4	2	9	6	5	3	1			34
Borispolskii R.	1	4	1	2		4					12
Obukhovskii R.	2	1	2	2	3	1					11
Belotserkovskii R.	1	5	2	4	3			9	1		25
Skvirskii R.						2					2
Yagotinskii R.					1		1				2
P. Khmelnitskii R.	1	1		2		1	1	2		1	9
Kagarlytskii R.		1									1
Rakitnyanskii R.	64	69	68	66	65	52	60	44	18	11	517
Volodarskii R.											
Mironovskii R.	1	1	1	1	3		1				8
Boguslavskii R.				1			1				2
Taraschanskii R.							1		1		2
Stavischenskii R.	29	37	36	32	57	57	52	29	12	1	342
Tetievskii R.					1					1	2
Total	478	492	526	526	525	505	486	308	135	47	4028

A1-T44. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Girls. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	16	19	16	29	24	22	8	6	1	1	142
Polesskii R.											
Ivankovskii R.	17	14	15	18	11	33	64	52	19	2	245
Borodyanskii R.	122	114	123	116	98	104	85	44	6	4	816
Vishgorodskii R.	87	105	93	97	105	101	100	72	43	23	826
Irpenskii R.	52	70	43	93	109	117	118	87	45	17	751
K. Svyatoshinskii R.	18	22	11	34	38	36	41	13	1		214
Makarovskii R.		1	1	1							3
Brovarskii R.	38	49	37	30	26	34	25	8	8	8	263
Vasilkovskii R.	1		1	2							4
Fastovskii R.	3		1	1		1	1	1			8
Zgurovskii R.											
Baryshevskii R.	1	4	5	3	2	4	1		2		22
Borispolskii R.	4	3	1	6	3		1				18
Obukhovskii R.	1		1	1	1		1				5
Belotserkovskii R.	3	6	3	3		3	3	3			24
Skvirskii R.	1	1				1					3
Yagotinskii R.	1	1	2					1		1	6
P. Khmelnitskii R.				1		2	3				6
Kagarlytskii R.				1	1		2				4
Rakitnyanskii R.	65	75	84	67	68	78	61	58	37	19	612
Volodarskii R.											
Mironovskii R.				3	2	4	2				11
Boguslavskii R.	1				2	1	1				5
Taraschanskii R.		1			1	1					3
Stavischenskii R.	41	35	43	29	51	67	50	61	28	2	407
Tetievskii R.							1				1
Total	472	520	480	535	542	609	568	406	190	77	4399

A1-T45. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Boys. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	13	16	6	3	7	2					47
Polesskii R.											
Ivankovskii R.						1					1
Borodyanskii R.		1						1			2
Vishgorodskii R.						1	1				2
Irpenskii R.	170	204	246	198	176	155	74	36	8		1267
K. Svyatoshinskii R.	49	80	114	99	88	136	86	48	21	1	722
Makarovskii R.	1	1	1	2							5
Brovarskii R.		6	14	12	12	8	12	10	4		78
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.	5	2	2	3	1	1					14
Obukhovskii R.		2									2
Belotserkovskii R.		1						1			2
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.			1								1
Volodarskii R.	127	132	131	82	81	44	22	6			625
Mironovskii R.											
Boguslavskii R.	15	23	37	28	23	41	33	17	6		223
Taraschanskii R.	1										1
Stavischenskii R.											
Tetievskii R.	50	41	45	38	22	27	19	5	7	3	257
Total	431	509	597	465	410	416	247	124	46	4	3249

A1-T46. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Girls. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	14	18	6	7	4	4	5	4	2		64
Polesskii R.											
Ivankovskii R.	1	2		1							4
Borodyanskii R.											
Vishgorodskii R.	2	2	1								5
Irpenskii R.	153	189	225	212	151	121	98	60	12		1221
K. Svyatoshinskii R.	63	101	95	96	87	113	82	64	41	3	745
Makarovskii R.	2	1									3
Brovarskii R.		3	8	13	17	16	17	12	2		88
Vasilkovskii R.											
Fastovskii R.			2	1					1		4
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.	7	4	4		1	4					20
Obukhovskii R.		2						1			3
Belotserkovskii R.				2							2
Skvirskii R.	1										1
Yagotinskii R.		1			1						2
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.		2									2
Volodarskii R.	138	132	130	105	91	95	39	13		3	746
Mironovskii R.			1								1
Boguslavskii R.	15	14	35	26	25	35	26	17	13		206
Taraschanskii R.			1			1					2
Stavischenskii R.											
Tetievskii R.	40	38	50	42	35	41	44	20	15	12	337
Total	436	509	558	505	412	430	311	191	86	18	3456

A1-T47. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Boys. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	5	6	6	8	7	2	1				35
Polesskii R.											
Ivankovskii R.											
Borodyanskii R.											
Vishgorodskii R.									1		1
Irpenskii R.	104	115	130	108	98	38	11	2			606
K. Svyatoshinskii R.	32	57	45	44	29	32	14	4			257
Makarovskii R.											
Brovarskii R.	1					1					2
Vasilkovskii R.											
Fastovskii R.								1			1
Zgurovskii R.											
Baryshevskii R.	11	6	7	7	5	6	3				45
Borispolskii R.								2			2
Obukhovskii R.									1		1
Belotserkovskii R.											
Skvirskii R.											
Yagotinskii R.								1			1
P. Khmelnitskii R.											
Kagarlytskii R.		1									1
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.									1		1
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.			1					1			2
Total	153	185	189	167	139	79	29	11	3		955

A1-T48. Number of examined children by place of residence and age at the time of the accident. Kiev region, Ukraine. Girls. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Kiev City	4	4	5	4	9	4	3	2	2		37
Polesskii R.											
Ivankovskii R.						1					1
Borodyanskii R.	1				1						2
Vishgorodskii R.					1						1
Irpenskii R.	109	134	109	98	77	45	13	5			590
K. Svyatoshinskii R.	27	44	62	39	41	33	24	16	1		287
Makarovskii R.			1			1					2
Brovarskii R.				1							1
Vasilkovskii R.											
Fastovskii R.	1										1
Zgurovskii R.						1					1
Baryshevskii R.	9	7	11	5	5	2	1				40
Borispolskii R.			1		1						2
Obukhovskii R.			1								1
Belotserkovskii R.				1							1
Skvirskii R.											
Yagotinskii R.	1	1									2
P. Khmelnitskii R.											
Kagarlytskii R.				1			1				2
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.					1						1
Stavischenskii R.											
Tetievskii R.			1								1
Total	152	190	191	149	136	87	42	23	3		973

A1-T49. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Boys. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	21	24	17	9	7	23	14	8	2	1	126
Ovruchskii R.	2	7	10	20	25	21	14	10	6	5	120
Olevskii R.		2	3	9	8	10	8	4	6	1	51
Narodichskii R.		2	2	3	6	3	2	4	6	3	31
Korostenskii R.		1	1	9	20	20	8	2	1		62
Luginskii R.	3	9	6	8	4	4	8	7	5		54
Emilchinskii R.		1	13	6	13	16	9	9	2	1	70
Malinskii R.	1	1	7	10	17	10	11	3	2	1	63
V. Volinskii R.	1		1	1	1	2		1	3	1	11
N. Volinskii R.	1	1	1	10	7	8	6	5	3	1	43
Radomishliskii R.	8	4	1								13
Brusilovskii R.			1								1
Total	37	52	63	85	108	117	80	53	36	14	645

A1-T50. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Girls. Examined in 1991.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	25	22	13	14	15	16	7	11	9	2	134
Ovruchskii R.	7	8	16	29	32	17	17	21	20	3	170
Olevskii R.		2	1	10	13	9	10	6	5	1	57
Narodichskii R.	4	4	6	7	3	5	6	9	13	7	64
Korostenskii R.		1		15	17	17	7	1	2	1	61
Luginskii R.	2	3	13	7	4	7	9	4	2		51
Emilchinskii R.	2	4	12	9	23	30	20	9	8	1	118
Malinskii R.		4	2	15	23	25	10	2	3		84
V. Volinskii R.			2		2		1	2	2	3	12
N. Volinskii R.		1	3	11	12	17	5	15	6	5	75
Radomishliskii R.	8	9	1								18
Brusilovskii R.											
Total	48	58	69	117	144	143	92	80	70	23	844

A1-T51. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Boys. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	31	55	53	54	55	50	75	104	59	13	549
Ovruchskii R.	10	4	5	6	7	4	3	7	3	1	50
Olevskii R.			1	4		3	2	3	2	1	16
Narodichskii R.	10	9	10	12	13	10	12	11	4	4	95
Korostenskii R.	10	7	19	23	20	17	16	26	23	16	177
Luginskii R.	1	17	28	18	5			4	20	15	108
Emilchinskii R.	15	12	20	19	14	18	9	13	7	3	130
Malinskii R.	13	31	29	22	17	16	21	12	7	1	169
V. Volinskii R.	9	27	39	42	35	36	31	34	4		257
N. Volinskii R.	11	13	19	18	23	17	15	19	12	1	148
Radomishliskii R.											
Brusilovskii R.	12	17	11	12	14	17	21	11	10	3	128
Total	122	192	234	230	203	188	205	244	151	58	1827

A1-T52. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Girls. Examined in 1992.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	37	55	64	72	71	69	68	122	99	30	687
Ovruchskii R.	7	9	12	5	3	11	10	7	5		69
Olevskii R.		2	1	1	2	1		5	4	2	18
Narodichskii R.	8	15	16	14	15	16	11	17	11	1	124
Korostenskii R.	22	15	16	13	24	8	13	22	22	17	172
Luginskii R.	2	19	31	21	8	3	1	6	24	18	133
Emilchinskii R.	11	17	21	26	19	18	19	20	5	2	158
Malinskii R.	25	32	26	21	33	33	29	20	12	7	238
V. Volinskii R.	3	18	33	53	32	38	33	48	16	3	277
N. Volinskii R.	9	18	23	22	13	24	14	23	22	7	175
Radomishliskii R.											
Brusilovskii R.	20	12	13	9	16	7	12	22	11	2	124
Total	144	212	256	257	236	228	210	312	231	89	2175

A1-T53. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Boys. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	96	73	78	61	55	66	87	62	26	11	615
Ovruchskii R.	11	15	18	21	23	22	35	27	12	4	188
Olevskii R.	18	36	22	39	30	31	49	54	49	40	368
Narodichskii R.	2	4	1	1	4	4	5	3	4		28
Korostenskii R.	15	23	31	33	26	35	34	28	29	8	262
Luginskii R.	10	17	23	25	11	21	23	34	18	9	191
Emilchinskii R.				1	1						2
Malinskii R.	39	24	14	18	17	26	16	10	6	3	173
V. Volinskii R.	71	75	92	86	70	71	49	62	121	61	758
N. Volinskii R.	7	18	11	12	9	5	8	8	2	3	83
Radomishliskii R.											
Brusilovskii R.											
Total	269	285	290	297	246	281	306	288	267	139	2668

A1-T54. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Girls. Examined in 1993.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	94	76	85	55	67	78	88	83	61	28	715
Ovruchskii R.	7	9	31	21	21	39	59	53	30	11	281
Olevskii R.	12	41	31	44	51	32	41	56	84	78	470
Narodichskii R.	1		4	3	3	1	3	2	1	2	20
Korostenskii R.	16	32	33	34	28	35	51	39	38	17	323
Luginskii R.	5	27	28	38	22	28	27	32	29	23	259
Emilchinskii R.								2	1		3
Malinskii R.	18	19	19	23	21	25	10	14	3		152
V. Volinskii R.	42	75	71	78	66	75	64	107	165	88	831
N. Volinskii R.	9	14	13	17	19	16	9	10	6	2	115
Radomishliskii R.											
Brusilovskii R.											
Total	204	293	315	313	298	329	352	398	418	249	3169

A1-T55. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Boys. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	172	167	192	166	148	201	176	138	111	41	1512
Ovruchskii R.	3	3	2	1	2	2					13
Olevskii R.	41	38	28	27	25	30	24	9	3		225
Narodichskii R.	16	22	20	36	21	18	25	17	13		188
Korostenskii R.	178	120	119	111	121	111	120	91	58	19	1048
Luginskii R.	41	31	41	27	25	20	14	10	5		214
Emilchinskii R.	53	47	45	31	31	24	17	9	8		265
Malinskii R.											
V. Volinskii R.	45	37	42	37	33	34	22	3			253
N. Volinskii R.							1				1
Radomishliskii R.											
Brusilovskii R.											
Total	549	465	489	436	406	440	399	277	198	60	3719

A1-T56. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Girls. Examined in 1994.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	198	166	144	175	192	185	161	161	137	57	1576
Ovruchskii R.	3	1	5	1		3	1		1		15
Olevskii R.	34	55	34	36	36	34	52	18	13	1	313
Narodichskii R.	12	22	33	29	29	35	31	27	11		229
Korostenskii R.	203	122	118	142	115	120	105	96	51	18	1090
Luginskii R.	34	28	36	33	30	22	23	4	6		216
Emilchinskii R.	51	40	52	46	42	51	36	25	5	1	349
Malinskii R.					1				1		2
V. Volinskii R.	46	33	39	43	43	47	18	2	2	1	274
N. Volinskii R.		2				1					3
Radomishliskii R.											
Brusilovskii R.											
Total	581	469	461	505	488	498	427	333	227	78	4067

A1-T57. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Boys. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	166	121	91	121	87	107	108	88	25		914
Ovruchskii R.	14	16	19	13	22	13	11	11	4		123
Olevskii R.	68	58	57	59	50	51	48	32	12		435
Narodichskii R.											
Korostenskii R.	51	68	62	74	57	88	67	51	19		537
Luginskii R.	24	26	35	31	21	13	12	6	1		169
Emilchinskii R.	34	35	33	52	36	31	31	10			262
Malinskii R.	26	39	28	44	52	39	39	17			284
V. Volinskii R.	56	58	49	46	39	45	28	8			329
N. Volinskii R.	70	41	50	46	48	11	8	1			275
Radomishliskii R.											
Brusilovskii R.											
Total	509	462	424	486	412	398	352	224	61		3328

A1-T58. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Girls. Examined in 1995.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	165	115	94	112	118	106	109	75	25		919
Ovruchskii R.	14	13	18	18	11	16	18	23	4		135
Olevskii R.	68	55	43	87	47	43	44	42	37		466
Narodichskii R.											
Korostenskii R.	65	52	84	60	65	58	59	52	22		517
Luginskii R.	13	20	22	18	15	18	12	10			128
Emilchinskii R.	42	37	39	41	41	36	22	18			276
Malinskii R.	33	37	37	49	45	44	41	16	2		304
V. Volinskii R.	60	45	46	46	37	54	28	9	1		326
N. Volinskii R.	81	77	79	72	63	31	12	4	1		420
Radomishliskii R.											
Brusilovskii R.											
Total	541	451	462	503	442	406	345	249	92		3491

A1-T59. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Boys. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City	1	1	3	10	7			1			23
Ovruchskii R.	71	95	97	112	113	136	77	52			753
Olevskii R.											
Narodichskii R.											
Korostenskii R.											
Luginskii R.											
Emilchinskii R.	41	40	40	32	32	51	34	10			280
Malinskii R.	58	71	60	78	82	59	24	15			447
V. Volinskii R.											
N. Volinskii R.											
Radomishliskii R.											
Brusilovskii R.											
Total	171	207	200	232	234	246	135	78			1503

A1-T60. Number of examined children by place of residence and age at the time of the accident. Zhitomir region, Ukraine. Girls. Examined in 1996.

Place of residence	Age (years) at the time of the accident										Total
	0	1	2	3	4	5	6	7	8	9	
Korosten City		10	6	19	5	1					41
Ovruchskii R.	85	118	127	128	114	110	118	42	1		843
Olevskii R.						1		1			2
Narodichskii R.											
Korostenskii R.		1		1			1				3
Luginskii R.											
Emilchinskii R.	41	30	33	29	37	51	44	16			281
Malinskii R.	53	76	69	60	77	50	28	14			427
V. Volinskii R.											
N. Volinskii R.											
Radomishliskii R.											
Brusilovskii R.											
Total	179	235	235	237	233	213	191	73	1		1597

A2-T01. Number of children with measurements of free T_4 and TSH by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	211	228	37	40	607	669	342	376	301	387	39	62	1537	1762
Mozir City	6	5	4	2	19	29	1	3	17	15	5	10	52	64
Dobrushskii R.	155	170	294	338	17	19	4	9	17	20			487	556
Vetkovskii R.		4			17	12	8	12	6	8	2	3	33	39
Gomelskii R.	45	33	489	521	749	786	998	974	840	813	517	486	3638	3613
Loevskii R.	1	1	219	183	46	52	10	15	13	16	1		290	267
Braginskii R.	178	135		1	12	11	1	6		2		1	191	156
Checherskii R.			19	24	3	3	1	2	6	14			29	43
Buda-Koshelevskii R.	63	87	2		25	36	7	11	169	207	5	1	271	342
Rechitskii R.	5	6	3	3	28	28	748	756	30	37	47	52	861	882
Hoynikskii R.		1	151	140	8	3	8	10	404	353	2		573	507
Narovlyanskii R.	2	1							1				3	1
Kormyanskii R.	3	1	41	47	4	6	2	5	37	38		1	87	98
Rogachevskii R.		3	2	2	8	9	295	339	7	14			312	367
Zlobinskii R.	10	7	4	4	10	24	188	246		17		1	212	299
Svetlogorskii R.	2	1	1	2	15	23	4	4	9	23	6	3	37	56
Kalinkovichskii R.	2	3	1	5	13	13	1		33	21			50	42
Mozirskii R.	1	1		1	3	6			4	7		1	8	16
Elskii R.			87	129	2	3	3	7	10	9	1	1	103	149
Oktyabrskii R.	2			1		8	8	9	6	6		1	16	25
Petrikovskii R.	51	87		2	8	6	6	4	9	8	1	1	75	108
Lelchitskii R.	17	29			4	18	1	7	31	44			53	98
Zitkovichskii R.					1	1		1	4	11			5	13
Total	754	803	1354	1445	1599	1765	2636	2796	1954	2070	626	624	8923	9503

A2-T02. Number of children with measurements of free T_4 and TSH by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	64	59	794	857	1713	1773	1443	1512	991	1107	505	419	5510	5727
Bobruisk City					5	2				2			5	4
Hotimskii R.			1		14	12	40	17					55	29
Klimovichskii R.	41	38			1		95	75	131	148			268	261
Kostyukovichskii R.			136	152	53	65	42	45	3	3			234	265
Mstislavskii R.									1				1	
Krichevskii R.	128	141			1	3	1		10	12			140	156
Cherikovskii R.			99	109	40	53	262	266	10	14	36	41	447	483
Krasnopolskii R.			29	31	123	128	300	252	238	228	166	194	856	833
Goretskii R.				1	1	2			11	19			12	22
Chausskii R.	76	73	220	246	359	378	147	147	116	120		3	918	967
Slavgorodskii R.	174	186					4	11	16	13	82	77	276	287
Shklovskii R.							1	1	1	6			2	7
Mogilevskii R.	2	1	976	943	117	114	99	101	147	125	160	179	1501	1463
Bykhovskii R.	137	158	1		569	546	243	317	182	179	31	38	1163	1238
Kruglianskii R.							1					1	1	1
Belynichskii R.			1	1	1	1	1	2					3	4
Klichevskii R.			60	50		1							60	51
Kirovskii R.								1	1	1			1	2
Bobruiskii R.					2	8		1	2				4	9
Osipovichskii R.				1			2		1	2			3	3
Glusskii R.					24	20	2			1			26	21
Total	622	656	2317	2391	3023	3106	2683	2748	1861	1980	980	952	11486	11833

A2-T03. Number of children with measurements of free T_4 and TSH by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	312	259	1248	1374	2876	2863	622	494	347	512	34	30	5439	5532
Gordeevskii R.		1					633	641	27	31			660	673
Klintsovskii R.	1	1	112	120	443	391	1	9	75	77	3	3	635	601
Novozybkovskii R.			1		904	882	476	491					1381	1373
Zlynkovskii R.	1						784	849					785	849
Krasnogorskii R.							1		372	440	419	381	792	821
Total	314	261	1361	1494	4223	4136	2517	2484	821	1060	456	414	9692	9849

A2-T04. Number of children with measurements of free T_4 and TSH by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City	1	2	11	15	160	226	132	142	47	63	26	31	377	479
Polesskii R.	107	119	281	280	5	7							393	406
Ivankovskii R.	292	266	101	114	1	3	235	245	1	4		1	630	633
Borodyanskii R.	75	85	91	106	3	2	774	805	2			2	945	1000
Vishgorodskii R.	96	106	190	197	224	241	822	809	2	5	1	1	1335	1359
Irpenskii R.	1		134	197	242	222	618	742	1263	1214	602	582	2860	2957
K. Svyatoshinskii R.			1	3	496	515	187	211	719	727	214	253	1617	1709
Makarovskii R.	118	134	155	167	133	208		3	5	3		2	411	517
Brovarskii R.					486	499	245	262	78	88	1	1	810	850
Vasilkovskii R.					264	293	1	4					265	297
Fastovskii R.					217	391	10	7		4	1	1	228	403
Zgurovskii R.					1							1	1	1
Baryshevskii R.					97	71	34	22			45	40	176	133
Borispolskii R.					153	133	12	18	14	20	2	2	181	173
Obukhovskii R.					331	322	11	5	2	3	1	1	345	331
Belotserkovskii R.				1	174	189	25	24	2	2		1	201	217
Skvirskii R.					1		2	3		1			3	4
Yagotinskii R.							2	5		2	1	2	3	9
P. Khmelnitskii R.							8	6					8	6
Kagarlytskii R.				1	349	442	1	3			1	2	351	448
Rakitnyanskii R.							509	604	1	2			510	606
Volodarskii R.									625	741			625	741
Mironovskii R.					1	1	8	11					9	12
Boguslavskii R.					1		2	5	220	205	1		224	210
Taraschanskii R.						1	2	3	1	2		1	3	7
Stavischenskii R.						1	337	401					337	402
Tetievskii R.						1	2	1	257	337	2	1	261	340
Total	690	712	964	1081	3339	3768	3979	4341	3239	3423	898	925	13109	14250

A2-T05. Number of children with measurements of free T_4 and TSH by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	126	134	549	687	615	715	1510	1570	864	839	23	41	3687	3986
Ovruchskii R.	120	170	50	69	188	281	13	15	123	134	753	842	1247	1511
Olevskii R.	51	57	16	18	368	470	225	313	434	466		2	1094	1326
Narodichskii R.	31	64	95	124	28	20	188	229					342	437
Korostenskii R.	62	61	177	172	262	323	1048	1087	532	512		3	2081	2158
Luginskii R.	54	51	108	133	191	259	214	216	169	128			736	787
Emilchinskii R.	70	118	130	158	2	3	265	349	262	276	280	280	1009	1184
Malinskii R.	63	84	169	238	173	152		2	284	304	447	425	1136	1205
V. Volinskii R.	11	12	257	277	758	831	253	273	329	325			1608	1718
N. Volinskii R.	43	75	148	175	83	115	1	3	275	419			550	787
Radomishliskii R.	13	18											13	18
Brusilovskii R.	1		128	124									129	124
Total	645	844	1827	2175	2668	3169	3717	4057	3272	3403	1503	1593	13632	15241

A3-T01. Number of children with measurements of free T_4 and TSH by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	78	92	182	165	278	270	397	408	331	358	124	107	1390	1400
1	82	69	177	156	275	297	374	384	364	355	100	108	1372	1369
2	95	93	167	157	228	233	377	415	310	342	108	84	1285	1324
3	91	103	158	173	178	181	374	366	329	331	116	115	1246	1269
4	96	97	152	174	162	209	361	373	265	297	103	123	1139	1273
5	80	87	123	142	117	170	350	394	213	213	65	73	948	1079
6	79	86	127	146	125	156	271	307	117	137	9	8	728	840
7	74	65	113	128	119	116	110	123	20	34	1	6	437	472
8	51	69	96	135	60	63	18	25	4	3			229	295
9	28	42	59	69	57	70	4	1	1				149	182
Total	754	803	1354	1445	1599	1765	2636	2796	1954	2070	626	624	8923	9503

A3-T02. Number of children with measurements of free T_4 and TSH by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	138	144	227	200	418	362	389	382	269	286	140	118	1581	1492
1	145	125	221	194	277	269	430	442	271	253	116	141	1460	1424
2	87	88	257	255	306	288	364	375	293	289	129	128	1436	1423
3	76	86	236	258	373	379	354	345	298	299	137	132	1474	1499
4	60	62	264	261	351	386	308	316	266	319	145	159	1394	1503
5	29	54	279	313	356	396	267	306	251	251	166	143	1348	1463
6	24	32	283	303	367	364	278	203	136	170	106	92	1194	1164
7	22	28	261	241	274	285	158	201	59	84	39	39	813	878
8	25	24	181	221	193	216	101	141	17	25	1		518	627
9	16	13	108	145	108	161	34	37	1	4	1		268	360
Total	622	656	2317	2391	3023	3106	2683	2748	1861	1980	980	952	11486	11833

A3-T03. Number of children with measurements of free T_4 and TSH by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	95	105	86	89	382	370	344	340	108	116	77	87	1092	1107
1	115	69	121	121	466	424	315	298	87	89	61	75	1165	1076
2	47	26	155	133	526	498	324	297	111	82	91	78	1254	1114
3	13	15	147	161	495	534	313	288	96	97	104	77	1168	1172
4	9	7	152	144	506	528	326	308	112	96	83	70	1188	1153
5	10	16	118	112	539	519	297	264	86	129	36	21	1086	1061
6	13	11	124	123	606	521	263	272	90	128	4	6	1100	1061
7	7	7	116	135	426	435	173	206	61	122			783	905
8	3	3	186	220	218	232	111	151	60	131			578	737
9	2	2	156	256	59	75	51	60	10	70			278	463
Total	314	261	1361	1494	4223	4136	2517	2484	821	1060	456	414	9692	9849

A3-T04. Number of children with measurements of free T_4 and TSH by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	102	93	150	146	399	382	463	461	429	429	139	140	1682	1651
1	101	103	129	132	340	394	484	512	507	503	176	180	1737	1824
2	109	112	121	114	371	400	515	474	594	555	180	184	1890	1839
3	118	123	110	127	380	374	524	526	465	503	148	139	1745	1792
4	85	113	115	118	342	392	522	540	410	408	135	129	1609	1700
5	77	79	82	107	352	420	501	599	416	424	77	86	1505	1715
6	50	38	89	132	374	437	484	565	245	308	29	42	1271	1522
7	26	20	72	100	439	456	306	402	123	191	11	23	977	1192
8	12	21	61	67	234	337	134	186	46	84	3	2	490	697
9	10	10	35	38	108	176	46	76	4	18			203	318
Total	690	712	964	1081	3339	3768	3979	4341	3239	3423	898	925	13109	14250

A3-T05. Number of children with measurements of free T_4 and TSH by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	37	48	122	144	269	204	549	577	509	539	171	179	1657	1691
1	52	58	192	212	285	293	464	468	456	444	207	233	1656	1708
2	63	69	234	256	290	315	489	460	417	450	200	235	1693	1785
3	85	117	230	257	297	313	436	505	468	476	232	236	1748	1904
4	108	144	203	236	246	298	406	488	409	436	234	233	1606	1835
5	117	143	188	228	281	329	440	498	387	390	246	212	1659	1800
6	80	92	205	210	306	352	398	425	349	337	135	191	1473	1607
7	53	80	244	312	288	398	277	331	219	247	78	73	1159	1441
8	36	70	151	231	267	418	198	227	58	84		1	710	1031
9	14	23	58	89	139	249	60	78					271	439
Total	645	844	1827	2175	2668	3169	3717	4057	3272	3403	1503	1593	13632	15241

A4-T01. Number of children with hypothyroidism by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	1	1			3			1	1	1		1	5	4
Mozir City														
Dobrushskii R.	1	1		2									1	3
Vetkovskii R.														
Gomelskii R.	1			3	2	4	1	2		1			4	10
Loevskii R.				1				1						2
Braginskii R.														
Checherskii R.														
Buda-Koshelevskii R.														
Rechitskii R.								4	1	1			1	5
Hoynikskii R.			1										1	
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.														
Zlobinskii R.														
Svetlogorskii R.														
Kalinkovichskii R.				1										1
Mozirskii R.														
Elskii R.				1										1
Oktyabrskii R.														
Petrikovskii R.						1	1						1	1
Lelchitskii R.									1				1	
Zitkovichskii R.														
Total	3	2	1	8	5	5	2	8	3	3		1	14	27

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A4-T02. Number of children with hypothyroidism by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City				1		1	1						1	2
Bobruisk City														
Hotimskii R.														
Klimovichskii R.														
Kostyukovichskii R.			1										1	
Mstislavskii R.														
Krichevskii R.		1												1
Cherikovskii R.														
Krasnopolskii R.								1	1				1	1
Goretskii R.														
Chausskii R.														
Slavgorodskii R.	1	2											1	2
Shklovskii R.														
Mogilevskii R.			2	1									2	1
Bykhovskii R.														
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total	1	3	3	2		1	1	1	1				6	7

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A4-T03. Number of children with hypothyroidism by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	1			1	4	4							5	5
Gordeevskii R.							1						1	
Klintsovskii R.														
Novozybkovskii R.						2								2
Zlynkovskii R.								2						2
Krasnogorskii R.												1		1
Total	1			1	4	6	1	2				1	6	10

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and $TSH > 2.90$ µIU/ml.

A4-T04. Number of children with hypothyroidism by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City														
Polesskii R.														
Ivankovskii R.														
Borodyanskii R.		1						1						2
Vishgorodskii R.														
Irpenskii R.							1			1		1	1	2
K. Svyatoshinskii R.						1				3				4
Makarovskii R.														
Brovarskii R.					1				1				2	
Vasilkovskii R.														
Fastovskii R.					1								1	
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.														
Obukhovskii R.														
Belotserkovskii R.														
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.														
Rakitnyanskii R.								1						1
Volodarskii R.														
Mironovskii R.														
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.														
Tetievskii R.														
Total		1			2	1	1	2	1	4		1	4	9

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A4-T05. Number of children with hypothyroidism by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	1			3		2	1	2	1	1			3	8
Ovruchskii R.			1						1		5	6	7	6
Olevskii R.					1				3	1			4	1
Narodichskii R.														
Korostenskii R.			1			2	1	1	4	1			6	4
Luginskii R.		1				2			2	2			2	5
Emilchinskii R.								1		1	2	2	2	4
Malinskii R.										3	1	3	1	6
V. Volinskii R.				1	1	3							1	4
N. Volinskii R.										1				1
Radomishliskii R.														
Brusilovskii R.														
Total	1	1	2	4	2	9	2	4	11	10	8	11	26	39

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and $TSH > 2.90$ μIU/ml.

A5-T01. Number of children with hypothyroidism by age at the time of the accident and year of examination. Gomel region, Belarus.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0						2		2		1				5
1		1			2	2							2	3
2					1	1				1			1	2
3							1						1	
4	1		1	1	1			2	2	1			5	4
5				2				1				1		4
6				2	1		1	1	1				3	3
7	1	1		1				1					1	3
8	1			1				1					1	2
9				1										1
Total	3	2	1	8	5	5	2	8	3	3		1	14	27

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A5-T02. Number of children with hypothyroidism by age at the time of the accident and year of examination. Mogilev region, Belarus.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		1												1
1							1						1	
2			1					1					1	1
3														
4														
5				2		1			1				1	3
6			1										1	
7		1	1										1	1
8		1												1
9	1												1	
Total	1	3	3	2		1	1	1	1				6	7

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and $TSH > 2.90$ µIU/ml.

A5-T03. Number of children with hypothyroidism by age at the time of the accident and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1								1	
1	1							1				1	1	2
2						2								2
3				1										1
4						1								1
5						3		1						4
6					2		1						3	
7														
8					1								1	
9														
Total	1			1	4	6	1	2				1	6	10

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A5-T04. Number of children with hypothyroidism by age at the time of the accident and year of examination. Kiev region, Ukraine.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0										1		1		2
1					1	1							1	1
2										1				1
3		1					1			1			1	2
4								1						1
5					1					1			1	1
6								1						1
7									1				1	
8														
9														
Total		1			2	1	1	2	1	4		1	4	9

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A5-T05. Number of children with hypothyroidism by age at the time of the accident and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			1						2	1		1	3	2
1				1					3	1		1	3	3
2			1			1		1	2	2	1	4	4	8
3						1			1	2	2	1	3	4
4								1	2	3	3	1	5	5
5	1	1				3					2	3	3	7
6				2	2			1	1				3	3
7				1		1	1	1		1			1	4
8						2	1						1	2
9						1								1
Total	1	1	2	4	2	9	2	4	11	10	8	11	26	39

[a]Diagnosed when free $T_4 < 10.0$ pmol/l and TSH > 2.90 μIU/ml.

A6-T01. Number of children with hyperthyroidism by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City					1		1	4	1			2	3	6
Mozir City														
Dobrushskii R.						1								1
Vetkovskii R.														
Gomelskii R.				1		2	1		1			3	2	6
Loevskii R.			1										1	
Braginskii R.														
Checherskii R.														
Buda-Koshelevskii R.					1					1			1	1
Rechitskii R.								2				1		3
Hoynikskii R.														
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.								1						1
Zlobinskii R.							2	2					2	2
Svetlogorskii R.									1				1	
Kalinkovichskii R.														
Mozirskii R.														
Elskii R.														
Oktyabrskii R.														
Petrikovskii R.														
Lelchitskii R.						1								1
Zitkovichskii R.														
Total			1	1	2	4	4	9	3	1		6	10	21

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and TSH < 0.24 μIU/ml.

A6-T02. Number of children with hyperthyroidism by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City					1		3	2	1	1		2	5	5
Bobruisk City														
Hotimskii R.														
Klimovichskii R.														
Kostyukovichskii R.														
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.														
Krasnopolskii R.								1						1
Goretskii R.														
Chausskii R.			1										1	
Slavgorodskii R.								1						1
Shklovskii R.														
Mogilevskii R.			1	2		1	5	5		1		1	6	10
Bykhovskii R.		1				1	20	28					20	30
Kruglianskii R.														
Belynichskii R.								1						1
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total		1	2	2	1	2	28	38	1	2		3	32	48

Note: The data from the Mogilev Regional Diagnostic Center from 1994 require further explanation. The number of cases of subclinical hyperthyroidism detected in Mogilevskii and Bykhovskii rayons (districts) in 1994 was 58, but on re-examination three months later 43 were found to have returned to a euthyroid state. The other 15 cases were also confirmed to have later returned to a euthyroid state. This series of 58 cases therefore indicates several possibilities, which have already been discussed (cf. *A Report on the 1995 Chernobyl Sasakawa Project Workshop*. pp.127-134). Since there were rumors that not only iodine but also thyroid hormones were administered in some districts as a measure to prevent goiter, particular attention should be paid to data interpretation. [a]Diagnosed when free $T_4 > 25.0$ pmol/l and TSH < 0.24 µIU/ml.

A6-T03. Number of children with hyperthyroidism by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	1	1				2							1	3
Gordeevskii R.							1	1					1	1
Klintsovskii R.														
Novozybkovskii R.						2								2
Zlynkovskii R.														
Krasnogorskii R.									1				1	
Total	1	1				4	1	1	1				3	6

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and $TSH < 0.24$ μIU/ml.

A6-T04. Number of children with hyperthyroidism by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City						2	1						1	2
Polesskii R.														
Ivankovskii R.														
Borodyanskii R.								3						3
Vishgorodskii R.							1						1	
Irpenskii R.								2		1				3
K. Svyatoshinskii R.						2				1				3
Makarovskii R.														
Brovarskii R.					1		1						2	
Vasilkovskii R.														
Fastovskii R.						1								1
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.														
Obukhovskii R.														
Belotserkovskii R.						1								1
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.					1	2						1	1	3
Rakitnyanskii R.														
Volodarskii R.														
Mironovskii R.														
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.														
Tetievskii R.										2				2
Total					2	8	3	5		4		1	5	18

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and $TSH < 0.24$ μIU/ml.

A6-T05. Number of children with hyperthyroidism by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City				1		1	1	4	1				2	6
Ovruchskii R.												2		2
Olevskii R.						3								3
Narodichskii R.					1								1	
Korostenskii R.														
Luginskii R.														
Emilchinskii R.														
Malinskii R.												1		1
V. Volinskii R.						3		1		1				5
N. Volinskii R.														
Radomishliskii R.														
Brusilovskii R.														
Total				1	1	7	1	5	1	1		3	3	17

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and $TSH < 0.24$ μIU/ml.

A7-T01. Number of children with hyperthyroidism by age at the time of the accident and year of examination. Gomel region, Belarus.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0								1				1		2
1					2	1	1	1					3	2
2								3	1				1	3
3								1	1			1	1	2
4						1	1					1	1	2
5						1	1	1		1		1	1	4
6							1	2	1				2	2
7			1			1						2	1	3
8														
9				1										1
Total			1	1	2	4	4	9	3	1		6	10	20

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and TSH < 0.24 μIU/ml.

A7-T02. Number of children with hyperthyroidism by age at the time of the accident and year of examination. Mogilev region, Belarus.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		1					10	15					10	16
1							2	7				1	2	8
2							6	5					6	5
3			2		1		5	2	1	1		1	9	4
4				1			3	2				1	3	4
5				1				1		1				3
6						1		5						6
7							1						1	
8							1						1	
9						1		1						2
Total		1	2	2	1	2	28	38	1	2		3	32	48

Note: The data from the Mogilev Regional Diagnostic Center from 1994 require further explanation. The number of cases of subclinical hyperthyroidism detected in Mogilevskii and Bykhovskii rayons (districts) in 1994 was 58, but on re-examination 3 months later 43 were found to have returned to a euthyroid state. The other 15 cases were also confirmed to have later returned to a euthyroid state. This series of 58 cases therefore indicates several possibilities, which have already been discussed (cf. *A Report on the 1995 Chernobyl Sasakawa Project Workshop*. pp. 127–134). Since there were rumors that not only iodine but also thyroid hormones were administered in some districts as a measure to prevent goiter, particular attention should be paid to data interpretation. [a]Diagnosed when free $T_4 > 25.0$ pmol/l and TSH < 0.24 μIU/ml.

A7-T03. Number of children with hyperthyroidism by age at the time of the accident and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	1												1	
1														
2														
3		1					1						1	1
4								1						1
5														
6						2			1				1	2
7						1								1
8														
9						1								1
Total	1	1				4	1	1	1				3	6

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and $TSH < 0.24$ µIU/ml.

A7-T04. Number of children with hyperthyroidism by age at the time of the accident and year of examination. Kiev region, Ukraine.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0							1	1		1			1	2
1						1								1
2					2								2	
3							1					1	1	1
4						1		1						2
5						2								2
6						2	1			1			1	3
7						2		1		1				4
8										1				1
9								2						2
Total					2	8	3	5		4		1	5	18

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and $TSH < 0.24$ μIU/ml.

A7-T05. Number of children with hyperthyroidism by age at the time of the accident and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0							1						1	
1														
2														
3														
4						1		1		1				3
5					1	1		1				1	1	3
6						1		3				2		6
7						2								2
8									1				1	
9				1		2								3
Total				1	1	7	1	5	1	1		3	3	17

[a]Diagnosed when free $T_4 > 25.0$ pmol/l and $TSH < 0.24$ µIU/ml.

A8-T01. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	212	228	37	41	608	669	342	371	297	381	39	62	1535	1752
Mozir City	6	5	4	2	19	29	1	3	17	15	5	10	52	64
Dobrushskii R.	156	170	297	339	17	19	4	9	17	20			491	557
Vetkovskii R.		4			17	12	8	12	6	8	2	3	33	39
Gomelskii R.	50	35	499	533	749	787	998	974	839	812	517	486	3652	3627
Loevskii R.	1	1	227	190	46	52	9	13	13	16	1		297	272
Braginskii R.	178	135		1	12	11	1	6		2		1	191	156
Checherskii R.			19	24	3	3	1	2	6	14			29	43
Buda-Koshelevskii R.	63	88	2	1	25	36	7	11	169	205	5	2	271	343
Rechitskii R.	5	6	3	3	28	28	751	756	30	37	47	52	864	882
Hoynikskii R.		1	151	140	8	3	8	10	404	353	2		573	507
Narovlyanskii R.	2	1							1				3	1
Kormyanskii R.	3	1	44	47	4	6	2	5	37	38		1	90	98
Rogachevskii R.		3	2	2	8	9	296	339	7	14			313	367
Zlobinskii R.	10	7	4	4	10	24	187	246		16		1	211	298
Svetlogorskii R.	2	1	1	2	15	23	4	4	9	23	6	3	37	56
Kalinkovichskii R.	2	3	1	5	13	13	1		33	21			50	42
Mozirskii R.	1	1		1	3	6			4	7		1	8	16
Elskii R.			130	175	2	3	3	6	10	9	1	1	146	194
Oktyabrskii R.	2			1		8	8	8	6	6		1	16	24
Petrikovskii R.	58	92		2	8	6	6	4	9	8	1	1	82	113
Lelchitskii R.	17	29			4	18	1	7	31	44			53	98
Zitkovichskii R.					1	1		1	4	11			5	13
Total	768	811	1421	1513	1600	1766	2638	2787	1949	2060	626	625	9002	9562

A8-T02. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	1	1	278	303	1713	1773	1443	1513	991	1107	505	418	4931	5115
Bobruisk City					5	2				2			5	4
Hotimskii R.			1		14	12	40	17					55	29
Klimovichskii R.	1				1		95	75	131	148			228	223
Kostyukovichskii R.			136	152	53	65	42	45	3	3			234	265
Mstislavskii R.									1				1	
Krichevskii R.	128	141			1	3	1		10	12			140	156
Cherikovskii R.			99	109	40	53	262	265	10	14	36	41	447	482
Krasnopolskii R.			29	31	123	128	300	252	237	228	166	194	855	833
Goretskii R.				1	1	2			11	19			12	22
Chausskii R.	76	73	220	246	359	378	147	147	116	120		3	918	967
Slavgorodskii R.	174	186					4	11	16	13	82	77	276	287
Shklovskii R.							1	1	1	6			2	7
Mogilevskii R.	1		973	943	117	114	99	101	147	125	160	179	1497	1462
Bykhovskii R.	137	158	1		568	546	243	315	182	179	31	38	1162	1236
Kruglianskii R.							1					1	1	1
Belynichskii R.			1	1	1	1	1	2					3	4
Klichevskii R.			60	50		1							60	51
Kirovskii R.								1	1	1			1	2
Bobruiskii R.					2	8		1	2				4	9
Osipovichskii R.							2		1	2			3	2
Glusskii R.					24	20	2			1			26	21
Total	518	559	1798	1836	3022	3106	2683	2746	1860	1980	980	951	10861	11178

A8-T03. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	314	265	1265	1392	2902	2876	630	510	350	515	34	31	5495	5589
Gordeevskii R.		1					639	657	28	31			667	689
Klintsovskii R.	1	1	112	120	444	391	1	11	75	77	3	3	636	603
Novozybkovskii R.			1		907	894	486	495					1394	1389
Zlynkovskii R.	1						809	872					810	872
Krasnogorskii R.							1		373	448	420	381	794	829
Total	316	267	1378	1512	4253	4161	2566	2545	826	1071	457	415	9796	9971

A8-T04. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City	1	2	11	15	160	226	134	142	46	62	26	30	378	477
Polesskii R.	107	119	281	281	5	7							393	407
Ivankovskii R.	292	266	101	114	1	3	235	244	1	4		1	630	632
Borodyanskii R.	75	84	91	106	3	2	776	805	2			2	947	999
Vishgorodskii R.	96	106	190	197	224	241	834	826	2	5	1	1	1347	1376
Irpenskii R.	1		134	198	242	222	616	742	1263	1213	601	579	2857	2954
K. Svyatoshinskii R.			1	3	496	515	187	213	683	696	214	253	1581	1680
Makarovskii R.	118	134	155	167	133	207		3	5	3		2	411	516
Brovarskii R.					486	500	248	263	77	87	1	1	812	851
Vasilkovskii R.					264	294	1	4					265	298
Fastovskii R.					218	392	10	8		4	1	1	229	405
Zgurovskii R.					1							1	1	1
Baryshevskii R.					97	71	34	22			44	40	175	133
Borispolskii R.					153	133	12	18	14	20	2	2	181	173
Obukhovskii R.					331	322	11	5	2	3	1	1	345	331
Belotserkovskii R.				1	174	189	25	24	2	2		1	201	217
Skvirskii R.					1		2	3		1			3	4
Yagotinskii R.							2	6		2	1	2	3	10
P. Khmelnitskii R.							9	6					9	6
Kagarlytskii R.				1	349	442	1	3			1	2	351	448
Rakitnyanskii R.							510	604	1	2			511	606
Volodarskii R.									624	740			624	740
Mironovskii R.					1	1	8	11					9	12
Boguslavskii R.					1		2	5	220	206	1		224	211
Taraschanskii R.						1	2	3	1	2		1	3	7
Stavischenskii R.						1	338	401					338	402
Tetievskii R.						1	2	1	256	335	2	1	260	338
Total	690	711	964	1083	3340	3770	3999	4362	3199	3387	896	921	13088	14234

A8-T05. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	1	1	437	531	614	710	1510	1569	864	839	23	41	3449	3691
Ovruchskii R.			50	69	188	281	13	15	123	134	752	842	1126	1341
Olevskii R.			16	18	368	470	225	313	434	466		2	1043	1269
Narodichskii R.			95	124	28	20	188	229					311	373
Korostenskii R.		1	175	164	260	322	1048	1087	531	512		3	2014	2089
Luginskii R.			108	133	190	257	214	216	169	128			681	734
Emilchinskii R.			130	157	2	3	265	349	262	276	280	281	939	1066
Malinskii R.			169	237	173	152		2	284	304	446	424	1072	1119
V. Volinskii R.			257	277	758	831	253	273	327	325			1595	1706
N. Volinskii R.		1	148	175	83	115	1	3	274	419			506	713
Radomishliskii R.														
Brusilovskii R.	1		127	124									128	124
Total	2	3	1712	2009	2664	3161	3717	4056	3268	3403	1501	1593	12864	14225

A9-T01. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	81	93	192	178	278	271	398	407	331	357	124	107	1404	1413
1	84	71	184	163	276	297	374	382	363	351	100	109	1381	1373
2	98	93	177	161	228	233	376	415	308	342	108	84	1295	1328
3	93	104	161	181	178	181	374	365	328	330	116	115	1250	1276
4	96	97	158	182	162	209	363	371	265	295	103	123	1147	1277
5	82	89	134	152	117	170	350	392	213	212	65	73	961	1088
6	79	87	135	157	125	156	271	307	117	137	9	8	736	852
7	76	65	118	130	119	116	110	123	19	33	1	6	443	473
8	51	69	100	140	60	63	18	24	4	3			233	299
9	28	43	62	69	57	70	4	1	1				152	183
Total	768	811	1421	1513	1600	1766	2638	2787	1949	2060	626	625	9002	9562

A9-T02. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	116	123	185	167	418	362	389	382	268	286	140	118	1516	1438
1	104	85	174	154	277	269	430	442	271	253	116	141	1372	1344
2	75	82	185	171	306	288	364	375	293	289	129	128	1352	1333
3	70	78	175	186	373	379	354	345	298	299	137	132	1407	1419
4	53	55	207	201	351	386	308	316	266	319	145	159	1330	1436
5	25	46	212	240	355	396	267	304	251	251	166	143	1276	1380
6	20	29	219	234	367	364	278	202	136	170	106	92	1126	1091
7	16	24	215	190	274	285	158	202	59	84	39	38	761	823
8	23	24	141	171	193	216	101	141	17	25	1		476	577
9	16	13	85	122	108	161	34	37	1	4	1		245	337
Total	518	559	1798	1836	3022	3106	2683	2746	1860	1980	980	951	10861	11178

A9-T03. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	109	118	88	90	386	368	345	353	109	119	77	87	1114	1135
1	123	83	122	123	467	429	318	308	88	89	61	75	1179	1107
2	43	25	157	134	530	500	328	301	110	83	92	79	1260	1122
3	6	6	147	161	500	538	317	300	97	97	104	77	1171	1179
4	4	6	154	145	509	529	331	311	111	97	83	70	1192	1158
5	9	11	118	112	540	524	303	269	87	129	36	21	1093	1066
6	11	10	124	123	612	525	277	278	93	132	4	6	1121	1074
7	7	6	117	135	428	436	180	211	61	123			793	911
8	2	1	189	223	220	236	115	154	60	131			586	745
9	2	1	162	266	61	76	52	60	10	71			287	474
Total	316	267	1378	1512	4253	4161	2566	2545	826	1071	457	415	9796	9971

A9-T04. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	102	93	150	146	399	383	470	469	429	431	138	140	1688	1662
1	101	103	129	132	341	394	489	518	508	503	176	179	1744	1829
2	109	112	121	115	371	399	521	475	583	546	180	181	1885	1828
3	118	122	110	127	380	375	525	530	446	489	148	139	1727	1782
4	85	113	115	118	342	393	523	537	405	402	134	129	1604	1692
5	77	79	82	108	352	420	498	601	415	424	77	86	1501	1718
6	50	38	89	132	374	437	485	563	240	301	29	42	1267	1513
7	26	20	72	100	439	456	308	406	123	189	11	23	979	1194
8	12	21	61	67	234	337	133	186	46	84	3	2	489	697
9	10	10	35	38	108	176	47	77	4	18			204	319
Total	690	711	964	1083	3340	3770	3999	4362	3199	3387	896	921	13088	14234

A9-T05. Number of children with measurements of anti-thyroglobulin and anti-microsome antibodies by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			122	143	267	203	549	577	508	539	171	178	1617	1640
1			189	211	284	291	464	468	455	444	207	233	1599	1647
2	1	1	220	241	290	313	489	460	417	450	199	235	1616	1700
3		1	211	219	297	312	436	505	466	476	232	236	1642	1749
4			179	199	246	298	406	488	409	436	233	233	1473	1654
5	1		159	188	281	328	440	498	387	390	246	213	1514	1617
6			187	189	306	352	398	424	349	337	135	191	1375	1493
7		1	238	301	288	397	277	331	219	247	78	73	1100	1350
8			150	230	266	418	198	227	58	84		1	672	960
9			57	88	139	249	60	78					256	415
Total	2	3	1712	2009	2664	3161	3717	4056	3268	3403	1501	1593	12864	14225

A10-T01. Number of children with positive anti-thyroglobulin antibodies by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	5	10	1	9	18	33	9	37	4	15	6	15	43	119
Mozir City					1	3		1	2	2			3	6
Dobrushskii R.		1	12	16		2		3		2			12	24
Vetkovskii R.		1				1	1	2		1			1	5
Gomelskii R.	1		15	22	5	11	4	19	2	13	4	10	31	75
Loevskii R.			1	3	1	4	1			1			3	8
Braginskii R.	1					1							1	1
Checherskii R.					1					2			1	2
Buda-Koshelevskii R.	2	1	1	1		1				1			3	4
Rechitskii R.							5	20		2	4	4	9	26
Hoynikskii R.			5	4				1		5			5	10
Narovlyanskii R.														
Kormyanskii R.		1								1				2
Rogachevskii R.							3	4		1			3	5
Zlobinskii R.					1		1	1		1			2	2
Svetlogorskii R.								1		4				5
Kalinkovichskii R.						1				1				2
Mozirskii R.														
Elskii R.			10	17						1			10	18
Oktyabrskii R.														
Petrikovskii R.						1		1						2
Lelchitskii R.						1		1						2
Zitkovichskii R.														
Total	9	14	45	72	27	59	24	91	8	53	14	29	127	318

A10-T02. Number of children with positive anti-thyroglobulin antibodies by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City				4	15	54	11	66	4	35	12	27	42	186
Bobruisk City														
Hotimskii R.						1								1
Klimovichskii R.							3			2			3	2
Kostyukovichskii R.			1	2		1		4		1			1	8
Mstislavskii R.														
Krichevskii R.		1								1				2
Cherikovskii R.				1		1	3	8				2	3	12
Krasnopolskii R.					2	3		11	1	3	3	12	6	29
Goretskii R.										1				1
Chausskii R.			1		2	12	1	6		5		1	4	24
Slavgorodskii R.	1	8						1			1	2	2	11
Shklovskii R.														
Mogilevskii R.	1		6	22	1	7		1	3	6		4	11	40
Bykhovskii R.	1				6	21	2	12	4	7		2	13	42
Kruglianskii R.														
Belynichskii R.								1						1
Klichevskii R.				1										1
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.										1				1
Glusskii R.						1				1				2
Total	3	9	8	30	26	101	20	110	12	63	16	50	85	363

A10-T03. Number of children with positive anti-thyroglobulin antibodies by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	12	16	18	43	18	84	9	12	9	25	1		67	180
Gordeevskii R.							4	14					4	14
Klintsovskii R.			1	1	1	10		1	1	3			3	15
Novozybkovskii R.					3	12	5	17					8	29
Zlynkovskii R.							5	18					5	18
Krasnogorskii R.									3	13	5	7	8	20
Total	12	16	19	44	22	106	23	62	13	41	6	7	95	276

A10-T04. Number of children with positive anti-thyroglobulin antibodies by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City				1	3	16	3	4		3		3	6	27
Polesskii R.			2	4									2	4
Ivankovskii R.			1			1	4	16				1	5	18
Borodyanskii R.				2			7	29					7	31
Vishgorodskii R.					2	8	15	34	1				18	42
Irpenskii R.				4	4	11	7	22	14	41	8	35	33	113
K. Svyatoshinskii R.					9	22	1	4	10	34	5	6	25	66
Makarovskii R.				5	2	6			1			1	3	12
Brovarskii R.					4	15	3	12	4	3			11	30
Vasilkovskii R.					2	10							2	10
Fastovskii R.					6	23	2			1			8	24
Zgurovskii R.												1		1
Baryshevskii R.					2	4	1	2			2	1	5	7
Borispolskii R.					1	6	1			1			2	7
Obukhovskii R.					2	9				1			2	10
Belotserkovskii R.					2	12		2		2			2	16
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.					3	12						1	3	13
Rakitnyanskii R.							15	24					15	24
Volodarskii R.									4	21			4	21
Mironovskii R.							1						1	
Boguslavskii R.									1	5			1	5
Taraschanskii R.								1				1		2
Stavischenskii R.							6	20					6	20
Tetievskii R.									2	10			2	10
Total			3	16	42	155	66	170	37	122	15	50	163	513

A10-T05. Number of children with positive anti-thyroglobulin antibodies by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City		1	10	37	11	29	9	50	13	20		2	43	139
Ovruchskii R.			7	15	5	14			1	4	16	36	29	69
Olevskii R.					5	21	6	12	6	23			17	56
Narodichskii R.			12	17	1		5	7					18	24
Korostenskii R.			11	16	4	33	17	37	3	13			35	99
Luginskii R.			3	7	3	7	5	10	2	3			13	27
Emilchinskii R.			10	13			5	11	2	6	6	7	23	37
Malinskii R.			4	10	2	4		1	2	14	13	25	21	54
V. Volinskii R.			3	10	3	39	4	8	6	10			16	67
N. Volinskii R.			5	9	3	7			11	17			19	33
Radomishliskii R.														
Brusilovskii R.			4	10									4	10
Total		1	69	144	37	154	51	136	46	110	35	70	238	615

A11-T01. Number of children with positive anti-thyroglobulin antibodies by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		2	5	8	2	2	1	8	1	3	4	1	13	24
1			4	5	6	7	6	3		7	1	7	17	29
2	1	1	2	5	2	10	1	18		8	3	4	9	46
3		3	1	10	2	8	1	12	1	8	3	3	8	44
4	2	1	5	6	1	10	7	14	4	11	1	9	20	51
5	2	3	8	4	4	8	4	16	2	10	1	3	21	44
6	1	2	5	13	5	8	2	15		5	1	1	14	44
7	1		6	9	3	3		2		1		1	10	16
8	1	2	6	8	1	3	2	3					10	16
9	1		3	4	1								5	4
Total	9	14	45	72	27	59	24	91	8	53	14	29	127	318

A11-T02. Number of children with positive anti-thyroglobulin antibodies by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			3	1		4	1	9	1	3	1	3	6	20
1		1		1	2	5	2	18	1	10		6	5	41
2	1			1	1	9	5	15	2	10	3	7	12	42
3	1	2		1	1	7	2	11	3	7	2	4	9	32
4		2		4	4	8	3	13	1	11	4	11	12	49
5		1	2	4	2	12	2	13	2	7	5	12	13	49
6	1	2	1	4	6	26	2	10		7	1	5	11	54
7			1	6	4	10	2	16		5		2	7	39
8		1	1	3	2	10	1	4	2	2			6	20
9				5	4	10		1		1			4	17
Total	3	9	8	30	26	101	20	110	12	63	16	50	85	363

A11-T03. Number of children with positive anti-thyroglobulin antibodies by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	3	5	1	3		2	3	6		2	3	2	10	20
1	4	3	3		4	12	2	3	2	4		1	15	23
2					2	10	2	7					4	17
3	1		1	3		6	5	6	3	6	2	1	12	22
4	1	1	2	5	4	12	3	4	1	4		1	11	27
5		4	1	3		14	4	14	1	4	1	2	7	41
6	1	1	2	1	6	18	2	9	3	4			14	33
7	2	2		3	2	16	2	9		4			6	34
8			5	10	3	13		4	3	9			11	36
9			4	16	1	3				4			5	23
Total	12	16	19	44	22	106	23	62	13	41	6	7	95	276

A11-T04. Number of children with positive anti-thyroglobulin antibodies by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			1	1	2	8	6	7	4	6	1	10	14	32
1			1	2	1	10	4	12	3	17	5	6	14	47
2				1	4	13	6	18	5	13	4	9	19	54
3				1	4	10	6	17	5	9	2	9	17	46
4				4	4	18	12	22	7	20	1	6	24	70
5			1	1	4	33	12	29	5	18	1	7	23	88
6				1	8	16	12	26	4	16			24	59
7				2	9	25	4	24	2	12	1	2	16	65
8				2	3	14	3	9	1	10		1	7	36
9				1	3	8	1	6	1	1			5	16
Total			3	16	42	155	66	170	37	122	15	50	163	513

A11-T05. Number of children with positive anti-thyroglobulin antibodies by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			5	12	2	4	3	8	11	8	3	1	24	33
1			5	12		3	4	11	6	11	6	7	21	44
2			8	7	2	12	3	14	5	11	2	14	20	58
3		1	8	14	3	12	7	12	4	15	4	6	26	60
4			3	12	5	12	7	16	4	18	6	15	25	73
5			7	12	5	10	7	17	5	20	7	15	31	74
6			7	25	5	21	9	20	8	14	3	8	32	88
7			12	22	8	39	8	20	3	9	4	4	35	94
8			12	21	3	21	2	13		4			17	59
9			2	7	4	20	1	5					7	32
Total		1	69	144	37	154	51	136	46	110	35	70	238	615

A12-T01. Number of children with positive anti-microsome antibodies by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	2	5		3	5	5	4	15	1	11	3	5	15	44
Mozir City						2		1	2	1			2	4
Dobrushskii R.			5	7		1		2		1			5	11
Vetkovskii R.							1	1					1	1
Gomelskii R.			5	6		4	2	10	1	10	1	3	9	33
Loevskii R.				1		2	1						1	3
Braginskii R.	2												2	
Checherskii R.										1				1
Buda-Koshelevskii R.	1	1											1	1
Rechitskii R.							4	11		2	1	1	5	14
Hoynikskii R.			3	2				1		3			3	6
Narovlyanskii R.														
Kormyanskii R.										1				1
Rogachevskii R.							2	2		1			2	3
Zlobinskii R.							1	1		1			1	2
Svetlogorskii R.								1		3				4
Kalinkovichskii R.										1				1
Mozirskii R.														
Elskii R.			2	7									2	7
Oktyabrskii R.														
Petrikovskii R.						1		1						2
Lelchitskii R.														
Zitkovichskii R.														
Total	5	6	15	26	5	15	15	46	4	36	5	9	49	138

A12-T02. Number of children with positive anti-microsome antibodies by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City				3	10	22	11	52	3	24	6	16	30	117
Bobruisk City														
Hotimskii R.														
Klimovichskii R.							1			1			1	1
Kostyukovichskii R.				1				2						3
Mstislavskii R.														
Krichevskii R.		2												2
Cherikovskii R.						1	2	3		1		2	2	7
Krasnopolskii R.						2	1	9		2	2	7	3	20
Goretskii R.										1				1
Chausskii R.					3	6		3		2			3	11
Slavgorodskii R.		2						1				1		4
Shklovskii R.														
Mogilevskii R.	1		2	11	1	1		2	3	2	2	2	9	18
Bykhovskii R.		1			5	5	2	9		5			7	20
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.				1										1
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.										1				1
Glusskii R.						1								1
Total	1	5	2	16	19	38	17	81	6	39	10	28	55	207

A12-T03. Number of children with positive anti-microsome antibodies by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	4	6	8	19	16	47	5	14	4	12			37	98
Gordeevskii R.							4	14		3			4	17
Klintsovskii R.			2	1	1	3		1		3			3	8
Novozybkovskii R.					6	16	4	14					10	30
Zlynkovskii R.							10	20					10	20
Krasnogorskii R.										8	3	6	3	14
Total	4	6	10	20	23	66	23	63	4	26	3	6	67	187

A12-T04. Number of children with positive anti-microsome antibodies by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City				1	2	9		3		1		2	2	16
Polesskii R.			1	1									1	1
Ivankovskii R.	1	1				1	1	11				1	2	14
Borodyanskii R.	1	1		1			2	21				1	3	24
Vishgorodskii R.		1		2	1	4	8	12	1				10	19
Irpenskii R.				1	2	5	4	27	10	29	1	15	17	77
K. Svyatoshinskii R.					5	10	1	3	8	24	1	3	15	40
Makarovskii R.	3			4	1	2						1	4	7
Brovarskii R.					2	5	3	5	3	2			8	12
Vasilkovskii R.					1	6							1	6
Fastovskii R.					2	10				1			2	11
Zgurovskii R.														
Baryshevskii R.						4		1				1		6
Borispolskii R.						3						1		4
Obukhovskii R.					1	5	1						2	5
Belotserkovskii R.					1	6		1		2			1	9
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.						6						1		7
Rakitnyanskii R.							5	13					5	13
Volodarskii R.									1	8			1	8
Mironovskii R.														
Boguslavskii R.									1	5			1	5
Taraschanskii R.								1				1		2
Stavischenskii R.							5	11					5	11
Tetievskii R.									4	5			4	5
Total	5	3	1	10	18	76	30	109	28	77	2	27	84	302

A12-T05. Number of children with positive anti-microsome antibodies by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City		1	19	35	3	17	5	32	3	11		1	30	97
Ovruchskii R.			7	11	2	7			1	1	5	20	15	39
Olevskii R.				1	6	20	2	7	3	11			11	39
Narodichskii R.			16	22	1		1	2					18	24
Korostenskii R.			19	23	24	30	10	20	1	5			54	78
Luginskii R.			10	14	2	3	2	6	1	2			15	25
Emilchinskii R.			12	15	1		2	7	3	5	4	7	22	34
Malinskii R.			2	10		4		1		6	3	13	5	34
V. Volinskii R.			1	2	2	24	2	9	1	3			6	38
N. Volinskii R.			19	24	4	6			4	10			27	40
Radomishliskii R.														
Brusilovskii R.			2	8									2	8
Total		1	107	165	45	111	24	84	17	54	12	41	205	456

A13-T01. Number of children with positive anti-microsome antibodies by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		1	3	2			1	3		3	1		5	9
1			3	1		1	5	2		3		4	8	11
2			1	1		5		8		6	1	2	2	22
3			1	4	1		1	7		4	3		6	15
4		1	2	4		2	2	6	3	10		2	7	25
5	1	1	3	2	1	3	3	8	1	7		1	9	22
6	2	1		3	2	3	1	10		3			5	20
7	1	1		2		1		1					1	5
8		1	1	5			2	1					3	7
9	1		1	2	1								3	2
Total	5	6	15	26	5	15	15	46	4	36	5	9	49	138

A13-T02. Number of children with positive anti-microsome antibodies by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		1	1					9	1	2	2	2	4	14
1				1	2	1	1	16	2	8		3	5	29
2		1		1	3	2	5	7	1	6	3	4	12	21
3		1		1		5	5	10		7	1	2	6	26
4		1		2	2	4	1	7		4	3	6	6	24
5				3	1	2	3	9	1	5	1	8	6	27
6	1			1	4	7		8		5		2	5	23
7			1	3	3	5	2	10	1	2		1	7	21
8		1		1	3	5		4					3	11
9				3	1	7		1					1	11
Total	1	5	2	16	19	38	17	81	6	39	10	28	55	207

A13-T03. Number of children with positive anti-microsome antibodies by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	2	1	1	2	1	3	2	10		4	2	2	8	22
1	1	2	1		3	8	5	2		4		1	10	17
2					2	6	1	6					3	12
3			1	1	2	3	3	5	2	3	1	2	9	14
4			1	1	4	9	2	2		2			7	14
5		2		1	2	9	5	12		3		1	7	28
6	1		1	1	6	7	2	10		2			10	20
7		1	1	5	2	9	1	8	1	3			5	26
8			2	6	1	9	2	7	1	1			6	23
9			2	3		3		1		4			2	11
Total	4	6	10	20	23	66	23	63	4	26	3	6	67	187

A13-T04. Number of children with positive anti-microsome antibodies by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	1				1	6	3	7	3	3		4	8	20
1				1		5	1	8	1	7		5	2	26
2		1			1	8	1	15	7	7	1	4	10	35
3	2				2	1	4	12	1	10		6	9	29
4		1		3	2	5	2	13	4	12	1	5	9	39
5	1		1		1	16	6	20	7	11		2	16	49
6				1	3	11	8	14	2	13			13	39
7	1			3	3	13	4	13	2	6		1	10	36
8		1		1	3	8	1	5		7			4	22
9				1	2	3		2	1	1			3	7
Total	5	3	1	10	18	76	30	109	28	77	2	27	84	302

A13-T05. Number of children with positive anti-microsome antibodies by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			10	10	4	7	2	7	2	1	3	5	21	30
1			7	19	1	7	2	4	4	10		6	14	46
2			15	21	2	7	2	6	4	4	1	7	24	45
3		1	17	16	12	6	3	10	1	5	2	3	35	41
4			5	10	2	6	3	9	1	10	2	8	13	43
5			10	15	5	9	6	7	1	9	3	6	25	46
6			5	20	6	17	3	12	1	8		5	15	62
7			17	27	6	22	2	14	3	6	1	1	29	70
8			13	19	4	15	1	11		1			18	46
9			8	8	3	15		4					11	27
Total		1	107	165	45	111	24	84	17	54	12	41	205	456

A14-T01. Number of children who underwent thyroid ultrasonography by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	235	260	52	55	604	672	340	376	301	387	39	62	1571	1812
Mozir City	3	2	5	2	19	29	1		16	16	5	9	49	58
Dobrushskii R.	208	235	308	353	17	18	4	9	17	19			554	634
Vetkovskii R.		3			17	12	8	12	5	9	2	3	32	39
Gomelskii R.	54	39	581	646	723	745	993	976	841	816	522	492	3714	3714
Loevskii R.	2	3	226	194	45	52	10	15	13	15	1		297	279
Braginskii R.	251	203	1	1	12	12	1	6		2		1	265	225
Checherskii R.			31	43	3	3	1	2	6	13			41	61
Buda-Koshelevskii R.	103	96	2	1	23	37	7	11	169	209	4	2	308	356
Rechitskii R.	7	7	3	4	28	28	404	370	28	36	47	51	517	496
Hoynikskii R.		2	155	143	8	3	8	10	383	338	2		556	496
Narovlyanskii R.	2	1							1				3	1
Kormyanskii R.	3	1	46	47	4	5	2	3	37	38		1	92	95
Rogachevskii R.		3	2	2	8	9	247	277	7	14			264	305
Zlobinskii R.	10	6	4	4	10	24	160	211	1	17			185	262
Svetlogorskii R.	2		2	2	16	23	4	2	8	24	6	3	38	54
Kalinkovichskii R.	2	4	2	6	13	13	1		33	22			51	45
Mozirskii R.				3	3	6		2	4	7		1	7	19
Elskii R.			136	188	2	3	3	7	10	9	1	1	152	208
Oktyabrskii R.	2			1		8	8	9	6	6		1	16	25
Petrikovskii R.	58	95		2	8	6	6	4	9	8		1	81	116
Lelchitskii R.	21	31			4	18	1	7	30	44			56	100
Zitkovichskii R.					1	1		1	4	11			5	13
Total	963	991	1556	1697	1568	1727	2209	2310	1929	2060	629	628	8854	9413

A14-T02. Number of children who underwent thyroid ultrasonography by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	66	65	797	863	1710	1785	1435	1508	992	1118	501	425	5501	5764
Bobruisk City					6	2				2			6	4
Hotimskii R.			1		14	13	39	17					54	30
Klimovichskii R.	44	40			1		99	78	132	152			276	270
Kostyukovichskii R.			136	157	61	74	50	51	3	3			250	285
Mstislavskii R.									1				1	
Krichevskii R.	130	141			1	3	1		10	12			142	156
Cherikovskii R.			103	117	40	54	264	280	11	14	36	41	454	506
Krasnopolskii R.			32	30	126	133	307	259	238	233	157	188	860	843
Goretskii R.				1	1	2			11	19			12	22
Chausskii R.	76	76	225	253	363	394	152	147	113	120		3	929	993
Slavgorodskii R.	174	188					4	11	16	13	82	77	276	289
Shklovskii R.							1	1	1	6			2	7
Mogilevskii R.	2	1	984	958	116	113	103	105	143	125	159	180	1507	1482
Bykhovskii R.	136	158	1		571	557	250	327	183	181	31	39	1172	1262
Kruglianskii R.							1					1	1	1
Belynichskii R.			1	1	1	1	1	2					3	4
Klichevskii R.			60	53		1							60	54
Kirovskii R.								1	1	1			1	2
Bobruiskii R.					5	14		1	2				7	15
Osipovichskii R.				1			2		1	2			3	3
Glusskii R.					28	24				1			28	25
Total	628	669	2340	2434	3044	3170	2709	2788	1858	2002	966	954	11545	12017

A14-T03. Number of children who underwent thyroid ultrasonography by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	369	326	1282	1419	2939	2905	611	504	359	514	35	31	5595	5699
Gordeevskii R.		1					631	656	28	31			659	688
Klintsovskii R.	2	1	115	123	432	369	1	11	75	76	3	3	628	583
Novozybkovskii R.			1		908	903	485	498					1394	1401
Zlynkovskii R.							811	876					811	876
Krasnogorskii R.							1		364	433	416	379	781	812
Total	371	328	1398	1542	4279	4177	2540	2545	826	1054	454	413	9868	10059

A14-T04. Number of children who underwent thyroid ultrasonography by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City	1	2	11	15	158	222	131	142	47	63	35	36	383	480
Polesskii R.	73	85	282	284	15	8							370	377
Ivankovskii R.	292	266	100	114	1	3	234	245	1	4		1	628	633
Borodyanskii R.	75	87	92	105	3	2	780	814	2			2	952	1010
Vishgorodskii R.	96	106	190	197	224	242	833	823	2	5	1	1	1346	1374
Irpenskii R.	1		138	203	241	222	620	749	1261	1218	606	590	2867	2982
K. Svyatoshinskii R.			1	3	496	514	189	212	719	744	257	287	1662	1760
Makarovskii R.	118	137	154	166	133	209		3	5	3		2	410	520
Brovarskii R.					486	500	244	260	78	88	2	1	810	849
Vasilkovskii R.					264	296	1	4					265	300
Fastovskii R.					207	378	10	8		3	1	1	218	390
Zgurovskii R.					1	1						1	1	2
Baryshevskii R.					97	71	34	20			45	40	176	131
Borispolskii R.					151	128	11	17	14	20	2	2	178	167
Obukhovskii R.					330	322	11	5	2	3	1	1	344	331
Belotserkovskii R.				1	188	197	25	24	2	2		1	215	225
Skvirskii R.					1	3	2	3		1			3	7
Yagotinskii R.							2	6		2	1	2	3	10
P. Khmelnitskii R.							8	6					8	6
Kagarlytskii R.				1	349	442	1	3			1	2	351	448
Rakitnyanskii R.							516	608	1	2			517	610
Volodarskii R.									625	746			625	746
Mironovskii R.					1	1	8	11		1			9	13
Boguslavskii R.					1		2	5	223	206	1		227	211
Taraschanskii R.						1	2	2	1	2		1	3	6
Stavischenskii R.						1	341	404					341	405
Tetievskii R.						1	2	1	256	337	2	1	260	340
Total	656	683	968	1089	3347	3764	4007	4375	3239	3450	955	972	13172	14333

A14-T05. Number of children who underwent thyroid ultrasonography by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	125	134	549	687	615	715	1512	1573	913	911	23	41	3737	4061
Ovruchskii R.	120	170	50	69	177	262	13	15	123	135	753	842	1236	1493
Olevskii R.	51	57	16	18	368	470	224	313	435	466		2	1094	1326
Narodichskii R.	31	64	95	124	28	20	188	229					342	437
Korostenskii R.	55	52	177	172	262	323	1047	1090	537	516		3	2078	2156
Luginskii R.	54	51	108	133	191	259	214	216	169	128			736	787
Emilchinskii R.	67	107	129	155	2	3	265	349	262	276	280	281	1005	1171
Malinskii R.	63	84	169	238	173	152		2	284	304	446	427	1135	1207
V. Volinskii R.	11	12	257	277	758	831	253	274	329	326			1608	1720
N. Volinskii R.	43	75	148	175	83	115	1	3	275	419			550	787
Radomishliskii R.	13	18											13	18
Brusilovskii R.	1		128	124									129	124
Total	634	824	1826	2172	2657	3150	3717	4064	3327	3481	1502	1596	13663	15287

A15-T01. Number of children who underwent thyroid ultrasonography by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	114	133	200	199	273	266	346	334	321	351	129	108	1383	1391
1	117	93	208	187	273	297	306	323	345	352	101	109	1350	1361
2	129	113	197	176	223	226	318	355	310	343	107	87	1284	1300
3	118	139	173	201	171	171	300	305	333	335	116	116	1211	1267
4	110	125	168	202	159	203	310	312	266	292	102	123	1115	1257
5	95	113	153	180	114	169	297	325	214	214	65	72	938	1073
6	92	97	153	179	125	154	226	243	115	136	8	8	719	817
7	80	58	127	149	117	113	88	93	21	34	1	5	434	452
8	69	69	114	148	57	61	14	19	3	3			257	300
9	39	51	63	76	56	67	4	1	1				163	195
Total	963	991	1556	1697	1568	1727	2209	2310	1929	2060	629	628	8854	9413

A15-T02. Number of children who underwent thyroid ultrasonography by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	137	150	229	211	424	370	402	394	272	289	140	118	1604	1532
1	148	126	226	200	270	284	432	439	267	255	117	143	1460	1447
2	87	90	259	257	309	291	354	369	294	293	127	130	1430	1430
3	77	87	238	259	377	386	358	355	297	299	134	134	1481	1520
4	62	62	266	267	357	398	317	330	265	324	146	161	1413	1542
5	29	55	284	315	358	399	272	306	251	254	166	145	1360	1474
6	24	33	286	308	371	371	282	209	136	171	97	86	1196	1178
7	24	27	262	245	276	288	158	202	58	85	37	37	815	884
8	25	26	182	225	195	219	100	146	17	28	1		520	644
9	15	13	108	147	107	164	34	38	1	4	1		266	366
Total	628	669	2340	2434	3044	3170	2709	2788	1858	2002	966	954	11545	12017

A15-T03. Number of children who underwent thyroid ultrasonography by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	126	126	91	95	396	380	346	358	111	119	78	86	1148	1164
1	131	95	123	123	476	436	318	313	89	89	60	76	1197	1132
2	48	34	159	134	537	509	325	305	114	83	92	79	1275	1144
3	14	16	146	163	506	537	317	299	97	97	104	78	1184	1190
4	9	7	153	146	510	534	325	308	113	96	81	67	1191	1158
5	10	16	119	113	542	525	297	265	85	124	35	21	1088	1064
6	13	11	124	123	611	523	269	273	86	127	4	6	1107	1063
7	8	10	119	137	421	428	177	211	61	120			786	906
8	8	9	199	232	219	231	114	155	60	128			600	755
9	4	4	165	276	61	74	52	58	10	71			292	483
Total	371	328	1398	1542	4279	4177	2540	2545	826	1054	454	413	9868	10059

A15-T04. Number of children who underwent thyroid ultrasonography by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	102	96	150	146	399	382	474	469	430	436	153	152	1708	1681
1	98	104	129	131	345	394	490	516	509	508	185	190	1756	1843
2	108	112	122	118	370	404	523	479	593	557	189	191	1905	1861
3	102	100	111	127	380	373	523	532	464	502	167	149	1747	1783
4	72	103	116	120	341	393	523	537	407	412	139	136	1598	1701
5	77	79	82	111	350	422	500	606	415	430	79	87	1503	1735
6	49	38	90	132	379	435	486	566	247	311	29	41	1280	1523
7	26	20	72	99	440	448	308	405	124	191	11	23	981	1186
8	12	21	62	67	235	337	134	189	46	85	3	3	492	702
9	10	10	34	38	108	176	46	76	4	18			202	318
Total	656	683	968	1089	3347	3764	4007	4375	3239	3450	955	972	13172	14333

A15-T05. Number of children who underwent thyroid ultrasonography by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	37	48	121	144	268	204	549	580	509	540	171	179	1655	1695
1	51	58	192	210	284	293	465	469	461	445	207	235	1660	1710
2	62	67	234	256	289	309	488	460	424	462	200	235	1697	1789
3	80	115	230	256	297	312	436	505	486	502	231	237	1760	1927
4	107	142	203	236	246	297	406	488	412	441	234	233	1608	1837
5	116	137	188	228	278	328	440	498	398	406	246	213	1666	1810
6	78	87	205	210	304	347	399	426	352	345	135	190	1473	1605
7	53	79	244	312	286	395	277	333	224	248	78	73	1162	1440
8	36	69	151	231	266	416	198	227	61	92		1	712	1036
9	14	22	58	89	139	249	59	78					270	438
Total	634	824	1826	2172	2657	3150	3717	4064	3327	3481	1502	1596	13663	15287

A16-T01. Number of children with ultrasonographic thyroid abnormalities by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	5	10	2	4	45	85	23	62	22	46	11	34	108	241
Mozir City					3	7			2	2	1	5	6	14
Dobrushskii R.	3	10	1	3	2	2		2		5			6	22
Vetkovskii R.					1	2		3	1				2	5
Gomelskii R.	5	1	53	61	94	101	73	105	27	43	15	27	267	338
Loevskii R.			4	4	3	2	5	3	3	3			15	12
Braginskii R.	8	9										1	8	10
Checherskii R.						1				2				3
Buda-Koshelevskii R.	3	19	1	1	3	3	1		4	10			12	33
Rechitskii R.					5	3	55	85	3	6		4	63	98
Hoynikskii R.		1	7	12				2	11	13			18	28
Narovlyanskii R.		1												1
Kormyanskii R.						1		2		2				5
Rogachevskii R.		1			1	3	19	30					20	34
Zlobinskii R.				1	1	3	10	24		1			11	29
Svetlogorskii R.		1			4	2		1	1	3			5	7
Kalinkovichskii R.						1			1	4			1	5
Mozirskii R.					2	3		2					2	5
Elskii R.			1	7			1	1	1				3	8
Oktyabrskii R.							1	1				1	1	2
Petrikovskii R.	1	6			1	1		1					2	8
Lelchitskii R.	2	3				1		2	1				3	6
Zitkovichskii R.														
Total	27	62	69	93	165	221	188	326	77	140	27	72	553	914

A16-T02. Number of children with ultrasonographic thyroid abnormalities by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City			5	7	18	46	13	41	19	45	22	20	77	159
Bobruisk City														
Hotimskii R.	1												1	
Klimovichskii R.							2		1	1			3	1
Kostyukovichskii R.			1					2					1	2
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.			1	1			2	4		1		1	3	7
Krasnopolskii R.			1				1	5	4		5	7	11	12
Goretskii R.														
Chausskii R.		1	4	5	2	6		2	2	1			8	15
Slavgorodskii R.		3						1	1		1	2	2	6
Shklovskii R.														
Mogilevskii R.	1		10	23	1	2				2	8	6	20	33
Bykhovskii R.					1	3		5	1	3			2	11
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.					1								1	
Total	2	4	22	36	23	57	18	60	28	53	36	36	129	246

A16-T03. Number of children with ultrasonographic thyroid abnormalities by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City		1	58	76	94	116	17	8	8	20		1	177	222
Gordeevskii R.							14	21					14	21
Klintsovskii R.				2	10	10			2	1			12	13
Novozybkovskii R.					14	28	13	19					27	47
Zlynkovskii R.							27	21					27	21
Krasnogorskii R.									13	23	2	5	15	28
Total		1	58	78	118	154	71	69	23	44	2	6	272	352

A16-T04. Number of children with ultrasonographic thyroid abnormalities by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					6	14	5	9	1	10	4	6	16	39
Polesskii R.														
Ivankovskii R.						1		5	1				1	6
Borodyanskii R.	1	1					8	24	1			1	10	26
Vishgorodskii R.					8	12	33	55	2	1	1		44	68
Irpenskii R.				1	2	5	22	47	47	81	8	30	79	164
K. Svyatoshinskii R.					8	18	2	6	14	49	13	25	37	98
Makarovskii R.	1	1	1	2	6	20			3			1	11	24
Brovarskii R.					8	20	3	18	4	9	1		16	47
Vasilkovskii R.					9	9							9	9
Fastovskii R.					4	19	1			1	1	1	6	21
Zgurovskii R.						1								1
Baryshevskii R.						1	1	3			3	3	4	7
Borispolskii R.					2	8	1			1		1	3	10
Obukhovskii R.					9	23	1			2			10	25
Belotserkovskii R.					4	12		3		2			4	17
Skvirskii R.														
Yagotinskii R.										2	1		1	2
P. Khmelnitskii R.							1	1					1	1
Kagarlytskii R.					5	8		1				1	5	10
Rakitnyanskii R.							7	20					7	20
Volodarskii R.									4	33			4	33
Mironovskii R.										1				1
Boguslavskii R.									6	8	1		7	8
Taraschanskii R.								1		1		1		3
Stavischenskii R.							2	10					2	10
Tetievskii R.							1		2	10	1		4	10
Total	2	2	1	3	71	171	88	203	85	211	34	70	281	660

A16-T05. Number of children with ultrasonographic thyroid abnormalities by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City			2	8	5	8	10	20	9	16	1	1	27	53
Ovruchskii R.		1		1	1	4				5	9	14	10	25
Olevskii R.		1		1	7	9	1	1	6	18		1	14	31
Narodichskii R.		1	1	1	1			5					2	7
Korostenskii R.			2	2	2	3	8	21	3	11		1	15	38
Luginskii R.	1			3	3	6	1		2	1			7	10
Emilchinskii R.		1	1	2		2	1	3	5	14	4	12	11	34
Malinskii R.	1			3					6	9	5	15	12	27
V. Volinskii R.			3	2	4	23		9	5	8			12	42
N. Volinskii R.		1	1	4		1				12			1	18
Radomishliskii R.														
Brusilovskii R.			3	2									3	2
Total	2	5	13	29	23	56	21	59	36	94	19	44	114	287

A17-T01. Number of children with ultrasonographic thyroid abnormalities by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		7	9	8	26	28	22	24	9	14	7	5	73	86
1		5	6	13	31	39	19	23	10	17	3	10	69	107
2	1	7	6	7	21	23	21	34	10	21	5	10	64	102
3	1	10	6	10	22	26	27	35	12	22	7	12	75	115
4	5	5	13	11	17	25	33	49	17	32	2	24	87	146
5	3	1	11	10	9	28	25	74	8	22	2	8	58	143
6	3	7	4	11	21	25	25	60	10	10	1	3	64	116
7	6	5	5	8	14	16	14	22	1	2			40	53
8	4	14	6	13	2	5	2	4					14	36
9	4	1	3	2	2	6		1					9	10
Total	27	62	69	93	165	221	188	326	77	140	27	72	553	914

A17-T02. Number of children with ultrasonographic thyroid abnormalities by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	1		2	1	2	3	3	4	9	3	7	2	24	13
1				3	1	1	2	14	4	4	2	2	9	24
2			4	2	2	7	3	5	4	7	4	3	17	24
3			2	3		4	2	5	3	11	8	4	15	27
4		1	1	6	3	3	2	6	2	11	4	8	12	35
5			2	4	3	11	2	7	2	8	5	10	14	40
6	1	3	4	7	3	8	3	4	2	8	4	5	17	35
7			4	6	6	9	1	9	1	1	2	2	14	27
8			2	3	1	5		5	1				4	13
9			1	1	2	6		1					3	8
Total	2	4	22	36	23	57	18	60	28	53	36	36	129	246

A17-T03. Number of children with ultrasonographic thyroid abnormalities by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		1		2	4	8	11	3	1	3			16	17
1			2	4	7	6	3	2	2	2		1	14	15
2			5	6	9	9	6	4	1		1	2	22	21
3			11	4	15	14	5	4	4	5	1	2	36	29
4			6	5	8	18	7	8		6		1	21	38
5			1	3	16	27	9	6	4	8			30	44
6			7	5	23	27	15	12	4	8			49	52
7			3	7	19	27	10	14	2	3			34	51
8			9	13	16	16	4	14	5	7			34	50
9			14	29	1	2	1	2		2			16	35
Total		1	58	78	118	154	71	69	23	44	2	6	272	352

A17-T04. Number of children with ultrasonographic thyroid abnormalities by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	1				5	8	5	5	7	11	1	7	19	31
1				1	3	7	2	11	8	27	6	7	19	53
2		1			4	15	4	20	10	24	2	18	20	78
3					6	10	7	13	12	29	7	11	32	63
4					7	19	19	31	11	29	5	12	42	91
5	1			1	10	25	21	46	19	36	6	9	57	117
6			1		9	24	15	31	11	24	1	3	37	82
7		1		1	16	35	6	22	7	14	4	3	33	76
8					7	19	8	15		15	2		17	49
9					4	9	1	9		2			5	20
Total	2	2	1	3	71	171	88	203	85	211	34	70	281	660

A17-T05. Number of children with ultrasonographic thyroid abnormalities by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					2	1	1	4	1	1		1	4	7
1			1	1	1	2	2	2		4	2	2	6	11
2					1		1	2	1	4	2	2	5	8
3			2	2		2		4	1	13	2	9	5	30
4			2	1	1	2	2	3	7	17	6	6	18	29
5			2	1	1	2	4	14	5	16	3	10	15	43
6		2	2	2	3	7	3	9	11	23	2	10	21	53
7	1		2	13	4	17	6	11	8	12	2	4	23	57
8		1	1	7	3	10	1	8	2	4			7	30
9	1	2	1	2	7	13	1	2					10	19
Total	2	5	13	29	23	56	21	59	36	94	19	44	114	287

A18-T01. Number of children with thyroid cancer by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City		1				1	3	5	2	1		3	5	11
Mozir City												1		1
Dobrushskii R.		1								1				2
Vetkovskii R.														
Gomelskii R.						1		1	1	2			1	4
Loevskii R.									1				1	
Braginskii R.	1	1											1	1
Checherskii R.														
Buda-Koshelevskii R.			1	1									1	1
Rechitskii R.								1						1
Hoynikskii R.			1							1			1	1
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.								1						1
Zlobinskii R.								1						1
Svetlogorskii R.									1				1	
Kalinkovichskii R.														
Mozirskii R.														
Elskii R.														
Oktyabrskii R.														
Petrikovskii R.	1												1	
Lelchitskii R.		1												1
Zitkovichskii R.														
Total	2	4	2	1		2	3	9	5	5		4	12	25

A18-T02. Number of children with thyroid cancer by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City					1								1	
Bobruisk City														
Hotimskii R.														
Klimovichskii R.														
Kostyukovichskii R.														
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.								1						1
Krasnopolskii R.														
Goretskii R.														
Chausskii R.														
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.														
Bykhovskii R.														
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total					1			1					1	1

A18-T03. Number of children with thyroid cancer by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City		1		2	1	1	1	1					2	5
Gordeevskii R.														
Klintsovskii R.														
Novozybkovskii R.						1								1
Zlynkovskii R.														
Krasnogorskii R.														
Total		1		2	1	2	1	1					2	6

A18-T04. Number of children with thyroid cancer by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City						1								1
Polesskii R.														
Ivankovskii R.														
Borodyanskii R.														
Vishgorodskii R.														
Irpenskii R.				1										1
K. Svyatoshinskii R.										1				1
Makarovskii R.						1								1
Brovarskii R.									1				1	
Vasilkovskii R.														
Fastovskii R.					1								1	
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.														
Obukhovskii R.														
Belotserkovskii R.														
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.														
Rakitnyanskii R.														
Volodarskii R.														
Mironovskii R.														
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.														
Tetievskii R.														
Total				1	1	2			1	1			2	4

A18-T05. Number of children with thyroid cancer by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City					1			2	1				2	2
Ovruchskii R.														
Olevskii R.						1								1
Narodichskii R.														
Korostenskii R.							2	2					2	2
Luginskii R.														
Emilchinskii R.														
Malinskii R.														
V. Volinskii R.														
N. Volinskii R.														
Radomishliskii R.														
Brusilovskii R.														
Total					1	1	2	4	1				4	5

A19-T01. Number of children with thyroid cancer by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		2		1						1		1		5
1		1	1			2		2	1	2		2	2	9
2								1	2	1			2	2
3		1					3		1	1		1	4	3
4	1		1					1					2	1
5								1						1
6								2	1				1	2
7								1						1
8														
9	1							1					1	1
Total	2	4	2	1		2	3	9	5	5		4	12	25

A19-T02. Number of children with thyroid cancer by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0								1						1
1														
2														
3														
4					1								1	
5														
6														
7														
8														
9														
Total					1			1					1	1

A19-T03. Number of children with thyroid cancer by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		1				2		1						4
1					1								1	
2				1										1
3														
4							1						1	
5														
6				1										1
7														
8														
9														
Total		1		2	1	2	1	1					2	6

A19-T04. Number of children with thyroid cancer by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0						2				1				3
1				1	1				1				2	1
2														
3														
4														
5														
6														
7														
8														
9														
Total				1	1	2			1	1			2	4

A19-T05. Number of children with thyroid cancer by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0								1						1
1					1			1					1	1
2														
3						1								1
4							1						1	
5							1						1	
6														
7									1				1	
8								2						2
9														
Total					1	1	2	4	1				4	5

A20-T01. Number of children with thyroid nodules by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	2	6	1	1	7	17	7	22	10	11	3	8	30	65
Mozir City					1	3					1	3	2	6
Dobrushskii R.	2	2			1					1			3	3
Vetkovskii R.														
Gomelskii R.	1		10	10	32	34	6	18	7	10	3	8	59	80
Loevskii R.			2	2	1	1	1	2	2	1			6	6
Braginskii R.	2	1										1	2	2
Checherskii R.										2				2
Buda-Koshelevskii R.			1	1	3		1		1	2			6	3
Rechitskii R.					1	3	7	15	1	2		1	9	21
Hoynikskii R.			2						1	4			3	4
Narovlyanskii R.														
Kormyanskii R.						1				1				2
Rogachevskii R.						2	1	1					1	3
Zlobinskii R.					1		1	9					2	9
Svetlogorskii R.					1	1			1				2	1
Kalinkovichskii R.														
Mozirskii R.					1	2		1					1	3
Elskii R.									1				1	
Oktyabrskii R.												1		1
Petrikovskii R.	1												1	
Lelchitskii R.	1	1							1				2	1
Zitkovichskii R.														
Total	9	10	16	14	49	64	24	68	25	34	7	22	130	212

A20-T02. Number of children with thyroid nodules by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City					1	2	1	4	1	5	1	2	4	13
Bobruisk City														
Hotimskii R.														
Klimovichskii R.														
Kostyukovichskii R.														
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.										1				1
Krasnopolskii R.														
Goretskii R.														
Chausskii R.				1					1				1	1
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.				2										2
Bykhovskii R.								1		1				2
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total				3	1	2	1	5	2	7	1	2	5	19

A20-T03. Number of children with thyroid nodules by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City			4	3	17	21	5	3	1	4			27	31
Gordeevskii R.														
Klintsovskii R.					3	2				1			3	3
Novozybkovskii R.					6	8	3	4					9	12
Zlynkovskii R.							6	4					6	4
Krasnogorskii R.									1	3			1	3
Total			4	3	26	31	14	11	2	8			46	53

A20-T04. Number of children with thyroid nodules by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					1	2	1					1	2	3
Polesskii R.														
Ivankovskii R.								1						1
Borodyanskii R.							1	3					1	3
Vishgorodskii R.						1	2						2	1
Irpenskii R.				1				2		2				5
K. Svyatoshinskii R.										3	1		1	3
Makarovskii R.					1	1							1	1
Brovarskii R.						1		2	1				1	3
Vasilkovskii R.						2								2
Fastovskii R.					1	1							1	1
Zgurovskii R.														
Baryshevskii R.						1	1	1					1	2
Borispolskii R.														
Obukhovskii R.						3								3
Belotserkovskii R.					1	1							1	1
Skvirskii R.														
Yagotinskii R.										1				1
P. Khmelnitskii R.														
Kagarlytskii R.					1	1							1	1
Rakitnyanskii R.							1						1	
Volodarskii R.										1				1
Mironovskii R.														
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.								1						1
Tetievskii R.														
Total				1	5	14	6	10	1	7	1	1	13	33

A20-T05. Number of children with thyroid nodules by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City					1	1	3	4	1	1	1		6	6
Ovruchskii R.		1			1	3				1	2		3	5
Olevskii R.		1		1	2	1			2				4	3
Narodichskii R.		1						2						3
Korostenskii R.					2		1	5	1	1		1	4	7
Luginskii R.					2	1							2	1
Emilchinskii R.		1						1	1			1	1	3
Malinskii R.									1			1	1	1
V. Volinskii R.					1	5		3	1	2			2	10
N. Volinskii R.		1				1				2				4
Radomishliskii R.														
Brusilovskii R.														
Total		5		1	9	12	4	15	7	7	3	3	23	43

A21-T01. Number of children with thyroid nodules by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		3	1	2	5	4	1	1	1	3	2	3	10	16
1		1	1	3	10	13	1	7	2	5	1	5	15	34
2		1	1	1	3	6	4	11	2	6		1	10	26
3	1	1	1	3	5	10	7	3	7	5	2	5	23	27
4	2		4	1	2	6	1	7	6	6	1	6	16	26
5	1		3	1	5	5	5	18	5	7		2	19	33
6	2	2	2		8	10	5	14	2	1	1		20	27
7	1		1	2	8	6		5		1			10	14
8		2	1	1	2	1		1					3	5
9	2		1		1	3		1					4	4
Total	9	10	16	14	49	64	24	68	25	34	7	22	130	212

A21-T02. Number of children with thyroid nodules by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0									1				1	
1								1	1				1	1
2														
3				1						1				2
4								1		2		1		4
5								2		1				3
6							1			3			1	3
7					1	2		1			1	1	2	4
8				1										1
9				1										1
Total				3	1	2	1	5	2	7	1	2	5	19

A21-T03. Number of children with thyroid nodules by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0						1	2						2	1
1					1	3	1	1					2	4
2					1		1						2	
3				1	5	2	2						7	3
4						4	1	2					1	6
5					5	5	3	2		3			8	10
6					6	6	3	2	1	2			10	10
7			2	1	5	6	1	2	1	1			9	10
8			1	1	3	4		2		1			4	8
9			1							1			1	1
Total			4	3	26	31	14	11	2	8			46	53

A21-T04. Number of children with thyroid nodules by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1	2	1	1		1			2	4
1				1	1	1			1				2	2
2							1			1		1	1	2
3														
4						1	1	4		3	1		2	8
5					2	3		2		1			2	6
6						1	2	1		1			2	3
7					1	1		1					1	2
8						4	1	1					1	5
9						1								1
Total				1	5	14	6	10	1	7	1	1	13	33

A21-T05. Number of children with thyroid nodules by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1		1	2	1				3	2
1								1		1	1		1	2
2								1	1				1	1
3						1						1		2
4						1	2	1	1	3	2		5	5
5							1	2	1	1		1	2	4
6		2			2	3			1	2		1	3	8
7					1	4		4	1				2	8
8		1		1	1	2		2	1				2	6
9		2			4	1		2					4	5
Total		5		1	9	12	4	15	7	7	3	3	23	43

A22-T01. Number of children with thyroid cystic lesions by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City				1	1	3	6	5	6	8	1	1	14	18
Mozir City									1				1	
Dobrushskii R.										1				1
Vetkovskii R.								1	1				1	1
Gomelskii R.	1		3	4	10	11	3	3	5	6	2	2	24	26
Loevskii R.				1	1		2						3	1
Braginskii R.														
Checherskii R.						1								1
Buda-Koshelevskii R.									2				2	
Rechitskii R.					1		8	7	1	2		1	10	10
Hoynikskii R.										1				1
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.					1		1	1					2	1
Zlobinskii R.						1	1	1					1	2
Svetlogorskii R.					1								1	
Kalinkovichskii R.										1				1
Mozirskii R.														
Elskii R.														
Oktyabrskii R.														
Petrikovskii R.														
Lelchitskii R.														
Zitkovichskii R.														
Total	1		3	6	15	16	21	18	16	19	3	4	59	63

A22-T02. Number of children with thyroid cystic lesions by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City			2		5	6	5	2	1	5	2	4	15	17
Bobruisk City														
Hotimskii R.														
Klimovichskii R.														
Kostyukovichskii R.														
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.														
Krasnopolskii R.									1		1	1	2	1
Goretskii R.														
Chausskii R.				1				1		1				3
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.			1							2		1	1	3
Bykhovskii R.						1								1
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.					1								1	
Total			3	1	6	7	5	3	2	8	3	6	19	25

A22-T03. Number of children with thyroid cystic lesions by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City			6	4	21	14	4		4	8			35	26
Gordeevskii R.							3	4					3	4
Klintsovskii R.					1	1			1				2	1
Novozybkovskii R.					1	4	5	8					6	12
Zlynkovskii R.							7	5					7	5
Krasnogorskii R.									1	2	1	1	2	3
Total			6	4	23	19	19	17	6	10	1	1	55	51

A22-T04. Number of children with thyroid cystic lesions by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City								1		1				2
Polesskii R.														
Ivankovskii R.									1				1	
Borodyanskii R.								1						1
Vishgorodskii R.							1	2					1	2
Irpenskii R.							3	2	2	4			5	6
K. Svyatoshinskii R.					2	6			1	4	1	1	4	11
Makarovskii R.												1		1
Brovarskii R.								1		1				2
Vasilkovskii R.														
Fastovskii R.														
Zgurovskii R.														
Baryshevskii R.								1						1
Borispolskii R.						1								1
Obukhovskii R.					3	1							3	1
Belotserkovskii R.								1						1
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.					1								1	
Rakitnyanskii R.							1	1					1	1
Volodarskii R.										5				5
Mironovskii R.										1				1
Boguslavskii R.									2	3			2	3
Taraschanskii R.														
Stavischenskii R.								1						1
Tetievskii R.														
Total					6	8	5	11	6	19	1	2	18	40

A22-T05. Number of children with thyroid cystic lesions by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City			1	4	2	4	3	9	3	12		1	9	30
Ovruchskii R.				1						2	4	8	4	11
Olevskii R.					4	6				5			4	11
Narodichskii R.			1					3					1	3
Korostenskii R.				1		1	3	4	1	6			4	12
Luginskii R.				3		3			1				1	6
Emilchinskii R.							1	1	2	11		3	3	15
Malinskii R.				2					3	8	2	9	5	19
V. Volinskii R.				1		10		2		5				18
N. Volinskii R.				3						8				11
Radomishliskii R.														
Brusilovskii R.			3	1									3	1
Total			5	16	6	24	7	19	10	57	6	21	34	137

A23-T01. Number of children with thyroid cystic lesions by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1	2	3		1	3			5	5
1			1	1	2	1	3		2	3	1		9	5
2			1	1	2	1	2	2	4	2			9	6
3					3	3			2	4		1	5	8
4			1	1	2	4	6	4	2	5		1	11	15
5						1	2	5	1	2	2	1	5	9
6	1			2	2		4	4	4			1	11	7
7				1	2	2	1	1					3	4
8								2						2
9					1	2							1	2
Total	1		3	6	15	16	21	18	16	19	3	4	59	63

A23-T02. Number of children with thyroid cystic lesions by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1		3						4	
1										1				1
2			1							1			1	1
3										1	2		2	1
4						1				2		4		7
5			1		1			1		2	1	2	3	5
6						1	1		2				3	1
7			1	1	2	1	1	1		1			4	4
8						2		1						3
9					2	2							2	2
Total			3	1	6	7	5	3	2	8	3	6	19	25

A23-T03. Number of children with thyroid cystic lesions by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					2		2	1					4	1
1							1		2				3	
2			1		2			1			1		4	1
3			1		2	2	1	1				1	4	4
4			1	1		2	2	1					3	4
5					2	3	2	1	1	2			5	6
6			1		5	4	5	2	1	3			12	9
7					5	5	4	3	1	1			10	9
8			2	2	5	3	2	5	1	4			10	14
9				1				2						3
Total			6	4	23	19	19	17	6	10	1	1	55	51

A23-T04. Number of children with thyroid cystic lesions by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1				1				2	
1										2				2
2					2			1		4		1	2	6
3										2				2
4											1		1	
5							1	2	4	5			5	7
6					2		3	3	1	3		1	6	7
7					1	4		2		2			1	8
8						4	1	2		1			1	7
9								1						1
Total					6	8	5	11	6	19	1	2	18	40

A23-T05. Number of children with thyroid cystic lesions by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0					1	1		1		1			1	3
1			1			1				2		1	1	4
2					1			1		3		1	1	5
3			1	2				3	1	8		5	2	18
4						1				5	2	3	2	9
5			1			2	1	5	2	13	2	3	6	23
6				1	1	3	1	4	4	15	2	5	8	28
7			1	6	1	6	3	2	2	7		3	7	24
8				5	1	6	1	3	1	3			3	17
9			1	2	1	4	1						3	6
Total			5	16	6	24	7	19	10	57	6	21	34	137

A24-T01. Number of children with abnormal thyroid echogenity by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	3	5	1	3	36	65	10	35	5	26	7	26	62	160
Mozir City					2	4			1	2		2	3	8
Dobrushskii R.	1	8	1	1	1	1		2		3			3	15
Vetkovskii R.					1	1		2					1	3
Gomelskii R.	1	1	17	24	50	57	63	84	14	24	9	16	154	206
Loevskii R.			3	4	1		3	1	1	2			8	7
Braginskii R.	6	7											6	7
Checherskii R.														
Buda-Koshelevskii R.	2	17				3				7			2	27
Rechitskii R.					3		40	63	1	2		2	44	67
Hoynikskii R.		1	6	9				2	8	8			14	20
Narovlyanskii R.		1												1
Kormyanskii R.								2		1				3
Rogachevskii R.		1				1	17	27					17	29
Zlobinskii R.						2	7	12		1			7	15
Svetlogorskii R.		1			2			1		3			2	5
Kalinkovichskii R.						1			1	3			1	4
Mozirskii R.					1			1					1	1
Elskii R.			1	7			1	1					2	8
Oktyabrskii R.							1	1					1	1
Petrikovskii R.	1	6			1	1		1					2	8
Lelchitskii R.	1	1				1		2					1	4
Zitkovichskii R.														
Total	15	49	29	48	98	137	142	237	31	82	16	46	331	599

A24-T02. Number of children with abnormal thyroid echogenity by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City			2	7	9	36	8	35	14	32	19	14	52	124
Bobruisk City														
Hotimskii R.														
Klimovichskii R.	1						1		1	1			3	1
Kostyukovichskii R.			1					2					1	2
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.			1	1			2	2				1	3	4
Krasnopolskii R.								5	2		5	6	7	11
Goretskii R.														
Chausskii R.		1	4	3	2	6		1					6	11
Slavgorodskii R.		3						1	1		1	2	2	6
Shklovskii R.														
Mogilevskii R.	1		5	17	1	2					8	5	15	24
Bykhovskii R.					1	1		3	1	1			2	5
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total	2	4	13	28	13	45	11	49	19	34	33	28	91	188

A24-T03. Number of children with abnormal thyroid echogenity by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City			50	66	58	87	8	8	3	9		1	119	171
Gordeevskii R.							11	14					11	14
Klintsovskii R.				2	6	7			1				7	9
Novozybkovskii R.					6	16	5	8					11	24
Zlynkovskii R.							12	12					12	12
Krasnogorskii R.									10	17	1	4	11	21
Total			50	68	70	110	36	42	14	26	1	5	171	251

A24-T04. Number of children with abnormal thyroid echogenity by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					5	12	4	8	1	8	4	4	14	32
Polesskii R.														
Ivankovskii R.						1		4						5
Borodyanskii R.	1	1					7	20	1			1	9	22
Vishgorodskii R.					8	11	28	53	2	1	1		39	65
Irpenskii R.				1	2	5	19	42	45	76	8	29	74	153
K. Svyatoshinskii R.					6	12	2	6	12	42	11	23	31	83
Makarovskii R.	1	1	1	2	5	19			2				9	22
Brovarskii R.					8	19	3	15	3	8	1		15	42
Vasilkovskii R.					9	8							9	8
Fastovskii R.					3	18	1			1	1	1	5	20
Zgurovskii R.						1								1
Baryshevskii R.								2			3	3	3	5
Borispolskii R.					2	7	1			1		1	3	9
Obukhovskii R.					6	19	1			2			7	21
Belotserkovskii R.					3	11		2		2			3	15
Skvirskii R.														
Yagotinskii R.										1	1		1	1
P. Khmelnitskii R.							1	1					1	1
Kagarlytskii R.					3	7		1				1	3	9
Rakitnyanskii R.							5	19					5	19
Volodarskii R.									4	27			4	27
Mironovskii R.														
Boguslavskii R.									4	6	1		5	6
Taraschanskii R.								1		1		1		3
Stavischenskii R.							2	9					2	9
Tetievskii R.							1		2	10	1		4	10
Total	2	2	1	3	60	150	75	183	76	186	32	64	246	588

A24-T05. Number of children with abnormal thyroid echogenity by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City				2		2	1	5	5	1			6	10
Ovruchskii R.						1				1	1	5	1	7
Olevskii R.					1	2	1	1	4	12		1	6	16
Narodichskii R.				1	1								1	1
Korostenskii R.			1	1		2	1	7	1	2			3	12
Luginskii R.	1				1	2	1		1	1			4	3
Emilchinskii R.				2		2			2	3	3	7	5	14
Malinskii R.				1					2		2	4	4	5
V. Volinskii R.					3	10		4	4	1			7	15
N. Volinskii R.			1							2			1	2
Radomishliskii R.														
Brusilovskii R.				2										2
Total	1		2	9	6	21	4	17	19	23	6	17	38	87

A25-T01. Number of children with abnormal thyroid echogenity by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		2	7	1	19	21	18	22	7	6	5	2	56	54
1		3	2	8	19	25	15	15	6	8	1	4	43	63
2		6	3	3	16	16	15	20	4	13	4	9	42	67
3	1	7	1	5	11	13	19	32	1	12	5	6	38	75
4	2	5	4	5	12	15	26	37	7	21	1	17	52	100
5	2	1	5	2	4	19	18	51	2	13		6	31	92
6	1	5	1	6	11	15	16	43	4	8		2	33	79
7	3	5	2	7	5	8	13	15		1			23	36
8	2	14	3	10		4	2	2					7	30
9	4	1	1	1	1	1							6	3
Total	15	49	29	48	98	137	142	237	31	82	16	46	331	599

A25-T02. Number of children with abnormal thyroid echogenity by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	1		1	1	1	3		3	8	3	7	2	18	12
1				3	1	1	2	11	1	3	2	2	6	20
2			2	2	1	7	3	5	3	5	4	3	13	22
3			1	2		4	2	5	3	9	6	4	12	24
4		1		4	1	2	2	6	2	5	4	3	9	21
5				3	2	9	1	5	1	5	5	8	9	30
6	1	3	3	7	3	7		4		4	4	5	11	30
7			3	4	3	6	1	6	1		1	1	9	17
8			2	2	1	2		3					3	7
9			1			4		1					1	5
Total	2	4	13	28	13	45	11	49	19	34	33	28	91	188

A25-T03. Number of children with abnormal thyroid echogenity by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0				2	2	6	6	2	1	2			9	12
1			2	4	6	4	1	1		2		1	9	12
2			4	5	5	9	4	3	1			2	14	19
3			10	4	7	10	2	3	3	4	1	1	23	22
4			5	4	8	12	4	5		6		1	17	28
5			1	3	8	21	5	3	3	4			17	31
6			6	4	12	19	7	8	2	3			27	34
7			1	6	11	18	5	10		2			17	36
8			8	11	10	9	1	7	4	2			23	29
9			13	25	1	2	1			1			15	28
Total			50	68	70	110	36	42	14	26	1	5	171	251

A25-T04. Number of children with abnormal thyroid echogenity by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	1				3	6	4	4	6	10	1	6	15	26
1				1	2	6	2	11	6	24	6	7	16	49
2		1			2	15	3	20	10	19	2	16	17	71
3					6	10	7	13	12	27	7	11	32	61
4					7	19	18	27	11	26	3	11	39	83
5	1			1	8	22	20	43	15	31	6	8	50	105
6			1		7	23	9	27	9	21	1	2	27	73
7		1		1	14	30	6	18	7	12	4	3	31	65
8					7	11	5	12		14	2		14	37
9					4	8	1	8		2			5	18
Total	2	2	1	3	60	150	75	183	76	186	32	64	246	588

A25-T05. Number of children with abnormal thyroid echogenity by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0														
1							2			1	1	1	3	2
2										1		1		2
3						1				4	1	3	1	8
4				1				1	6	5	2	3	8	10
5				1	1		1	7	2	2	1	5	5	15
6			1	1		1		4	6	5		3	7	14
7	1			6	2	8	1	4	5	4	1	1	10	23
8			1		1	3		1		1			2	5
9					2	8							2	8
Total	1		2	9	6	21	4	17	19	23	6	17	38	87

A26-T01. Number of children with thyroid anomaly by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	1	1			2	4	1		1	2		1	5	8
Mozir City														
Dobrushskii R.	1	1		2									1	3
Vetkovskii R.						1								1
Gomelskii R.	3	1	31	31	10	5	3	2	1	3	1		49	42
Loevskii R.			1			2							1	2
Braginskii R.	1	2											1	2
Checherskii R.														
Buda-Koshelevskii R.	1	2							1	1			2	3
Rechitskii R.							2	1					2	1
Hoynikskii R.			1	3					2				3	3
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.							1	1					1	1
Zlobinskii R.				1			3	2					3	3
Svetlogorskii R.						1								1
Kalinkovichskii R.														
Mozirskii R.						1								1
Elskii R.														
Oktyabrskii R.														
Petrikovskii R.														
Lelchitskii R.		1												1
Zitkovichskii R.														
Total	7	8	33	37	12	14	10	6	5	6	1	1	68	72

A26-T02. Number of children with thyroid anomaly by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City			1		3	3		2	3	5			7	10
Bobruisk City														
Hotimskii R.														
Klimovichskii R.							1						1	
Kostyukovichskii R.														
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.								2						2
Krasnopolskii R.			1				1		1				3	
Goretskii R.														
Chausskii R.									1				1	
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.			4	4									4	4
Bykhovskii R.						1		1		1				3
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total			6	4	3	4	2	5	5	6			16	19

A26-T03. Number of children with thyroid anomaly by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City				4	4	1				1			4	6
Gordeevskii R.														
Klintsovskii R.														
Novozybkovskii R.					1								1	
Zlynkovskii R.							2						2	
Krasnogorskii R.									1	2			1	2
Total				4	5	1	2		1	3			8	8

A26-T04. Number of children with thyroid anomaly by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City										1		1		2
Polesskii R.														
Ivankovskii R.														
Borodyanskii R.								1						1
Vishgorodskii R.							2						2	
Irpenskii R.								2				1		3
K. Svyatoshinskii R.									1			1	1	1
Makarovskii R.									1				1	
Brovarskii R.														
Vasilkovskii R.														
Fastovskii R.														
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.														
Obukhovskii R.														
Belotserkovskii R.														
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.														
Rakitnyanskii R.														
Volodarskii R.														
Mironovskii R.														
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.														
Tetievskii R.														
Total							2	3	2	1		3	4	7

A26-T05. Number of children with thyroid anomaly by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City			1	2	1	1	3			2			5	5
Ovruchskii R.										1	2	1	2	2
Olevskii R.										1				1
Narodichskii R.														
Korostenskii R.			1				2	3		2			3	5
Luginskii R.														
Emilchinskii R.			1					1			1	1	2	2
Malinskii R.	1									1	1	1	2	2
V. Volinskii R.			3	1									3	1
N. Volinskii R.				1										1
Radomishliskii R.														
Brusilovskii R.														
Total	1		6	4	1	1	5	4		7	4	3	17	19

A27-T01. Number of children with thyroid anomaly by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0		2	3	5	2	2	2	1		2			7	12
1		2	3	4	3	4	2					1	8	11
2	1		2	2	1	1	1	1		2	1		6	6
3		3	4	5	3	1	1		2	1			10	10
4	2		8	5	2	1	2	1	2				16	7
5			5	8		3	1	1					6	12
6			2	4		2	1	1		1			3	8
7	2		3	1	1			1	1				7	2
8	2	1	2	2									4	3
9			1	1									1	1
Total	7	8	33	37	12	14	10	6	5	6	1	1	68	72

A27-T02. Number of children with thyroid anomaly by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0			1		1			1					2	1
1								2	2				2	2
2			1		1				1	1			3	1
3			1										1	
4			1	2	1					2			2	4
5			1	1		3	1		1	2			3	6
6			1				1			1			2	1
7				1				1						2
8						1		1	1				1	2
9														
Total			6	4	3	4	2	5	5	6			16	19

A27-T03. Number of children with thyroid anomaly by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0										1				1
1														
2					1		1						2	
3					3				1	1			4	1
4						1								1
5					1								1	
6														
7														
8							1			1			1	1
9				4										4
Total				4	5	1	2		1	3			8	8

A27-T04. Number of children with thyroid anomaly by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0												1		1
1									1	1			1	1
2														
3														
4								1				1		2
5												1		1
6							1		1				2	
7								1						1
8							1	1					1	1
9														
Total							2	3	2	1		3	4	7

A27-T05. Number of children with thyroid anomaly by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0												1		1
1				1		1								2
2							1				2		3	
3			1					1		1	1		2	2
4			2		1			1		4			3	5
5			1									1	1	1
6			1				2	1		1		1	3	3
7			1	2			2	1		1	1		4	4
8				1										1
9	1												1	
Total	1		6	4	1	1	5	4		7	4	3	17	19

A28-T01. Number of children with goiter by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	32	42	2	3	67	106	30	72	49	83	18	49	198	355
Mozir City	1				3	9			4	6	2	8	10	23
Dobrushskii R.	5	12	18	23	1	1		3	1	6			25	45
Vetkovskii R.					3	4	2	3	1	3	1	1	7	11
Gomelskii R.	4	7	20	33	48	76	105	148	107	183	62	89	346	536
Loevskii R.			5	11	10	16	4	1	4	3			23	31
Braginskii R.					1	5				1			1	6
Checherskii R.			5	7		1	1	1	2	3			8	12
Buda-Koshelevskii R.					5	8	1	3	32	49	1	1	39	61
Rechitskii R.					2	7	73	51	6	12	10	12	91	82
Hoynikskii R.		1	2	12	1	1		2	78	87	1		82	103
Narovlyanskii R.		1												1
Kormyanskii R.	1		2	2	1	2	1	2	3	8		1	8	15
Rogachevskii R.							91	127	1	4			92	131
Zlobinskii R.	1	2			2	4	38	83	1	5			42	94
Svetlogorskii R.	1				1	2		2	1	8	1		4	12
Kalinkovichskii R.				1		3			3	6			3	10
Mozirskii R.					1	1		2	1			1	2	4
Elskii R.			11	22				2	1	3			12	27
Oktyabrskii R.	1					3	2	2	1	1		1	4	7
Petrikovskii R.	14	33			2	2		2	1	2		1	17	40
Lelchitskii R.	3	9			2	6		1	9	13			14	29
Zitkovichskii R.					1	1		1	1	2			2	4
Total	63	107	65	114	151	258	348	508	307	488	96	164	1030	1639

A28-T02. Number of children with goiter by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City		3	13	38	315	433	270	363	261	355	126	166	985	1358
Bobruisk City					1	1							1	1
Hotimskii R.					2		4	3					6	3
Klimovichskii R.	2	1					7	19	34	56			43	76
Kostyukovichskii R.			5	14	11	23	6	8		1			22	46
Mstislavskii R.														
Krichevskii R.	25	21					1		3	7			29	28
Cherikovskii R.			8	11	12	20	28	35	2	3	14	23	64	92
Krasnopolskii R.			2	2	13	19	38	52	68	85	42	62	163	220
Goretskii R.									8	11			8	11
Chausskii R.	8	4	23	41	139	190	29	33	66	61		2	265	331
Slavgorodskii R.	20	38					1	3	7	6	30	35	58	82
Shklovskii R.										1				1
Mogilevskii R.			89	118	38	46	22	23	50	39	53	59	252	285
Bykhovskii R.	24	34			113	121	79	81	85	94	16	27	317	357
Kruglianskii R.														
Belynichskii R.			1	1	1		1	2					3	3
Klichevskii R.			7	12		1							7	13
Kirovskii R.								1						1
Bobruiskii R.					1	2		1	1				2	3
Osipovichskii R.				1			1			1			1	2
Glusskii R.					7	5				1			7	6
Total	79	101	148	238	653	861	487	624	585	721	281	374	2233	2919

A28-T03. Number of children with goiter by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	16	20	506	651	880	1111	178	183	183	301	13	14	1776	2280
Gordeevskii R.		1					240	280	14	21			254	302
Klintsovskii R.			26	28	152	152		7	55	59	2	3	235	249
Novozybkovskii R.			1		439	498	193	247					633	745
Zlynkovskii R.							396	445					396	445
Krasnogorskii R.							1		169	256	202	201	372	457
Total	16	21	533	679	1471	1761	1008	1162	421	637	217	218	3666	4478

A28-T04. Number of children with goiter by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City	1	2	2	6	92	122	48	61	14	27	16	23	173	241
Polesskii R.	40	58	167	167	9	4							216	229
Ivankovskii R.	191	165	30	42	1	2	154	172		3			376	384
Borodyanskii R.	27	42	49	70	1	2	293	371	1			1	371	486
Vishgorodskii R.	38	39	157	150	143	160	480	493	2	3	1	1	821	846
Irpenskii R.	1		37	63	82	91	267	396	491	584	155	202	1033	1336
K. Svyatoshinskii R.				1	266	311	93	130	403	446	127	166	889	1054
Makarovskii R.	75	94	85	113	84	152		3	3	3		2	247	367
Brovarskii R.					359	392	162	189	36	46	1	1	558	628
Vasilkovskii R.					129	158		2					129	160
Fastovskii R.					132	274	4	5		3	1	1	137	283
Zgurovskii R.					1	1							1	1
Baryshevskii R.					42	26	17	9			18	23	77	58
Borispolskii R.					70	76	4	13	3	11	1	2	78	102
Obukhovskii R.					178	185	4	4	2	3	1		185	192
Belotserkovskii R.					84	105	18	17	2	2		1	104	125
Skvirskii R.					1	3	1	3					2	6
Yagotinskii R.							1	3		2	1	2	2	7
P. Khmelnitskii R.							3	3					3	3
Kagarlytskii R.					209	268	1	1			1	1	211	270
Rakitnyanskii R.							337	434		2			337	436
Volodarskii R.									269	422			269	422
Mironovskii R.							4	5		1			4	6
Boguslavskii R.					1		1	4	126	140	1		129	144
Taraschanskii R.							2	2		2		1	2	5
Stavischenskii R.							185	242					185	242
Tetievskii R.							1		93	154	1	1	95	155
Total	373	400	527	612	1884	2332	2080	2562	1445	1854	325	428	6634	8188

A28-T05. Number of children with goiter by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	9	21	101	203	151	233	433	603	334	403	11	15	1039	1478
Ovruchskii R.	22	61	15	26	66	136	2	5	51	60	264	447	420	735
Olevskii R.	5	5	1	4	200	266	84	149	325	364		2	615	790
Narodichskii R.		17	21	36	9	8	42	77					72	138
Korostenskii R.	9	10	53	57	120	183	321	414	192	208		3	695	875
Luginskii R.	19	19	17	30	84	136	79	81	99	83			298	349
Emilchinskii R.	20	28	35	33		2	72	149	117	147	98	129	342	488
Malinskii R.	7	16	15	32	28	39		1	106	159	151	203	307	450
V. Volinskii R.	4	5	30	66	254	413	87	120	144	193			519	797
N. Volinskii R.	5	22	26	38	25	42	1		83	209			140	311
Radomishliskii R.														
Brusilovskii R.	1		24	40									25	40
Total	101	204	338	565	937	1458	1121	1599	1451	1826	524	799	4472	6451

A29-T01. Number of children with goiter by age at the time of the accident and year of examination. Gomel region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	7	15	5	6	23	28	28	45	27	56	14	12	104	162
1	6	6	5	7	15	34	35	42	51	58	10	22	122	169
2	6	8	8	6	15	24	34	52	48	65	14	23	125	178
3	6	10	5	11	18	17	44	71	35	83	24	35	132	227
4	10	12	9	8	15	30	33	67	51	98	22	48	140	263
5	12	10	7	9	10	31	96	118	57	79	9	18	191	265
6	3	18	7	28	13	36	55	87	29	40	3	5	110	214
7	7	8	6	14	18	30	19	19	7	9		1	57	81
8	5	11	11	16	12	12	3	7	1				32	46
9	1	9	2	9	12	16	1		1				17	34
Total	63	107	65	114	151	258	348	508	307	488	96	164	1030	1639

A29-T02. Number of children with goiter by age at the time of the accident and year of examination. Mogilev region, Belarus.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	13	13	10	7	70	66	44	42	60	62	17	31	214	221
1	19	9	13	8	40	46	39	52	69	65	26	52	206	232
2	12	14	6	11	52	44	48	59	90	111	47	54	255	293
3	13	11	12	11	60	76	53	61	88	120	50	59	276	338
4	9	8	12	16	53	112	71	88	91	126	52	81	288	431
5	3	10	18	33	88	139	59	103	87	101	57	63	312	449
6	3	10	22	38	111	138	81	76	64	73	25	24	306	359
7	1	13	22	48	77	101	48	71	27	44	7	10	182	287
8	3	8	19	37	63	78	31	59	9	17			125	199
9	3	5	14	29	39	61	13	13		2			69	110
Total	79	101	148	238	653	861	487	624	585	721	281	374	2233	2919

A29-T03. Number of children with goiter by age at the time of the accident and year of examination. Bryansk region, Russian Federation.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	3	4	14	22	99	81	123	109	40	46	29	30	308	292
1	5	7	30	31	133	114	108	101	32	41	23	36	331	330
2	3		54	36	153	145	122	119	46	35	48	41	426	376
3	2		54	47	118	179	104	143	45	55	47	52	370	476
4	1		35	48	159	226	124	163	57	66	47	44	423	547
5		1	41	50	186	266	129	150	52	88	19	10	427	565
6		1	50	69	259	318	124	165	58	92	4	5	495	650
7		4	57	92	214	251	89	117	42	87			402	551
8	2	3	126	147	119	131	54	75	43	83			344	439
9		1	72	137	31	50	31	20	6	44			140	252
Total	16	21	533	679	1471	1761	1008	1162	421	637	217	218	3666	4478

A29-T04. Number of children with goiter by age at the time of the accident and year of examination. Kiev region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	51	47	64	53	205	191	226	215	149	153	28	46	723	705
1	61	63	64	64	184	186	233	233	193	221	58	65	793	832
2	78	73	69	62	195	215	235	249	231	280	54	87	862	966
3	60	66	69	74	175	205	257	305	184	298	61	77	806	1025
4	38	58	61	64	188	257	266	340	193	255	52	67	798	1041
5	36	43	48	74	198	293	272	414	246	267	40	51	840	1142
6	25	22	50	90	246	319	280	384	150	195	19	25	770	1035
7	13	9	41	69	270	324	190	264	77	129	10	8	601	803
8	6	14	42	38	147	223	87	112	20	50	3	2	305	439
9	5	5	19	24	76	119	34	46	2	6			136	200
Total	373	400	527	612	1884	2332	2080	2562	1445	1854	325	428	6634	8188

A29-T05. Number of children with goiter by age at the time of the accident and year of examination. Zhitomir region, Ukraine.

Age at the time of the accident (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
0	3	3	17	15	40	30	106	131	193	205	51	76	410	460
1	8	8	20	24	68	79	95	117	152	181	73	109	416	518
2	8	11	27	39	73	99	110	126	167	213	71	113	456	601
3	10	21	29	36	93	108	116	176	192	290	79	116	519	747
4	10	25	27	51	65	120	111	211	179	257	89	114	481	778
5	17	32	34	67	110	178	168	273	210	269	91	119	630	938
6	13	31	53	68	122	211	167	236	199	212	44	109	598	867
7	14	27	65	137	143	228	131	174	127	145	26	43	506	754
8	13	35	55	94	151	249	88	110	32	54			339	542
9	5	11	11	34	72	156	29	45					117	246
Total	101	204	338	565	937	1458	1121	1599	1451	1826	524	799	4472	6451

A30-T01. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Gomel region, Belarus. Boys.

Place of residence	Age (years) at the time of examination: 5	6	7	8	9	10	11	12	13	14	15	16	17
Gomel	21[a]	30	109	226	237	210	183	203	161	103	54	27	11
City	2.1—8.4[b]	2.5—8.7	1.9—10.3	2.8—11.8	2.4—12.3	3.8—15.6	3.8—15.7	0.6—17.9	4.2—21.3	3.4—26.2	5.9—20.7	8.6—23.3	7.5—21.7
	4.2,4.6,5.6[c]	3.1,4.6,6.0	3.9,5.2,6.4	3.8,5.3,6.6	5.1,6.7,7.9	6.0,7.3,8.8	6.2,7.9,9.4	6.7,8.5,10.5	7.7,9.5,11.9	9.1,10.8,12.7	10.8,13.0,15.7	11.5,13.1,14.8	12.0,14.3,15.6
Mozir			3	5	5	6	8	9	10	3			
City			3.3—4.8	3.8—7.1	3.9—8.7	4.1—12.5	6.0—11.5	5.6—11.3	5.9—16.9	13.0—20.8			
			3.3,4.6,4.8	3.8,6.0,6.8	3.9,4.1,6.7	4.3,5.3,10.1	8.2,10.2,10.9	6.7,8.9,9.6	7.2,10.5,14.8	13.0,15.1,20.8			
Dobru-	23	66	76	79	77	60	42	55	46	20	5	1	4
shskii R.	2.1—6.8	2.4—8.9	3.1—9.8	2.8—10.2	3.5—13.0	4.1—10.8	3.5—12.9	4.4—13.6	4.6—13.7	5.4—15.8	7.3—13.2	14.9	11.1—23.1
	2.1,2.1,4.3	3.4,4.6,5.4	3.9,4.9,6.0	4.4,5.2,6.5	5.2,5.9,7.2	4.7,6.3,8.0	4.8,6.1,7.4	6.5,7.9,8.7	7.1,8.1,9.8	7.0,9.0,11.1	8.7,9.3.12.6		11.3,12.0,17.8
Vetkov-			1	2	4	5	8	4	3	3			2
skii R.			6.9	2.5—3.0	6.4—10.2	5.6—7.3	4.8—11.4	4.7—13.9	9.2—10.5	6.8—16.2			10.7—12.5
					6.6,7.1,8.8	6.1,6.9,7.0	6.9,8.5,10.0	5.9,9.1,12.5	9.2,10.2,10.5	6.8,9.5,16.2			
Gomelskii	4	49	180	329	476	526	548	479	464	458	173	21	6
R.	2.1—4.8	2.0—5.7	2.0—9.8	2.2—11.1	2.1—14.0	3.3—16.1	0.2—16.0	0.8—20.9	1.7—25.5	0.9—25.1	5.4—31.6	4.3—23.3	10.0—23.3
	2.2,3.4,4.6	2.6,2.6,2.6	3.3,3.3,6.0	3.8,5.4,6.7	4.3,6.1,7.4	4.6,6.5,7.9	5.0,7.2,8.8	6.4,8.2,9.4	7.2,9.2,11.3	8.0,10.4,12.9	9.2,10.9,13.2	10.6,11.8,15.8	13.5,15.7,18.8
Loevskii	4	57	33	39	27	29	26	30	22	19	9		2
R.	2.3—2.3	2.6—6.6	3.3—17.8	3.8—12.4	3.9—11.0	4.1—16.9	4.7—12.4	4.8—17.2	1.8—13.5	7.0—20.5	6.3—20.2		11.4—14.1
	2.3,2.3,2.3	2.6,2.6,2.6	3.3,3.3,3.3	3.8,3.8,3.8	3.9,3.9,6.4	4.3,4.3,6.2	4.7,4.7,6.5	5.7,5.7,5.7	7.2,7.2,7.2	7.6,7.6,10.5	9.2,9.2,9.2		
Bragin-	10	24	28	32	22	26	30	34	23	28	8		
skii R.	2.1—3.9	2.5—2.5	3.1—6.4	3.4—9.6	3.8—3.8	4.1—5.0	4.7—8.6	5.6—11.0	7.0—8.8	7.7—7.7	9.1—9.1		
	2.1,2.1,2.1	2.5,2.5,2.5	3.1,3.1,3.1	3.4,3.4,4.5	3.8,3.8,3.8	4.1,4.1,4.1	4.8,4.8,4.8	5.6,5.6,5.6	7.0,7.0,7.0	7.7,7.7,7.7	9.1,9.1,9.1		
Checher-		1		3	5	3	1	9	4	11	4		
skii R.		4.6		7.2—10.3	5.5—9.1	4.3—14.3	5.5	6.3—14.3	7.9—9.2	6.6—15.6	8.1—14.3		
				7.2,7.9,10.3	6.6,7.7,8.1	4.3,5.6,14.3		7.5,7.6,9.6	8.3,8.8,9.0	8.3,10.7,12.5	9.1,11.5,13.6		
Buda-	6	11	19	13	39	48	49	37	32	34	15	5	
Koshelev-	2.1—2.1	2.5—2.5	3.1—6.6	3.4—10.1	3.8—13.5	4.1—13.9	3.5—13.7	5.5—12.3	5.3—16.3	7.4—19.1	8.9—22.9	9.5—24.1	
skii R.	2.1,2.1,2.1	2.5,2.5,2.5	3.1,3.1,3.1	3.4,4.1,5.9	4.5,6.1,8.1	6.1,7.8,9.5	4.8,7.1,8.4	5.7,7.4,9.4	7.0,7.9,11.8	7.7,10.3,13.4	9.1,11.1,16.1	9.7,12.7,13.8	
Rechit-		3	1	52	87	95	50	67	81	52	14	6	8
skii R.		2.6—5.7	6.6	3.4—11.5	3.1—11.7	4.0—11.2	4.6—14.4	4.6—15.0	5.8—19.8	6.3—24.8	5.1—14.2	7.0—14.3	9.7—22.2
		2.6,2.8,5.7		4.6,5.9,7.3	5.2,6.4,7.4	6.0,6.6,8.1	6.6,7.5,9.4	6.9,8.4,9.8	7.6,9.7,11.5	9.3,10.8,13.3	8.6,11.4,13.9	9.6,11.2,13.4	10.6,13.5,17.6
Hoynik-		10	27	26	68	74	60	75	82	78	42	12	2
skii R.		2.6—2.6	3.3—3.3	3.2—7.2	3.2—10.3	4.1—19.8	4.1—12.2	3.9—17.6	5.7—18.9	6.0—22.7	7.5—22.9	9.1—18.3	12.3—13.2
		2.6,2.6,2.6	3.3,3.3,3.3	3.8,3.8,3.8	3.9,5.7,7.0	4.3,6.4,7.7	6.5,8.0,9.1	7.8,8.5,10.3	7.2,8.9,11.2	8.6,10.9,13.0	9.2,11.6,13.4	10.1,12.3,14.1	
Narov-			1			1	1						
lyanskii R.			6.4			7.1	6.5						
Kormyan-		7	9	12	17	15	9	6	11	3		1	2
skii R.		2.7—7.0	3.5—6.7	3.8—8.2	4.1—7.6	6.0—9.6	4.2—13.5	6.9—12.1	6.4—12.8	5.2—10.6		10.7	15.4—19.9
		3.1,4.7,5.6	4.2,5.4,6.3	5.1,5.4,6.4	5.2,6.2,6.7	6.7,8.2,8.8	6.7,7.8,10.8	8.0,9.6,11.5	8.0,9.7,11.1	5.2,8.5,10.6			

(cont.)

A30-T01. Continued.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Roga-				43	37	45	36	45	22	22	13		1
chevskii				3.3—15.1	3.3—13.5	4.3—13.4	4.8—15.8	5.2—19.4	7.1—19.5	7.7—14.3	6.8—21.3		12.2
R.				4.4,5.7,7.2	5.7,7.3,9.5	5.8,7.0,8.2	6.4,7.2,8.5	7.1,9.0,11.3	10.1,11.1,13.5	8.8,10.0,12.2	11.1,12.1,12.7		
Zlobinskii			2	16	36	20	41	20	32	11	5		2
R.			2.9—4.7	3.4—7.0	3.1—9.5	4.4—9.4	4.5—15.0	5.3—17.9	5.4—20.0	7.0—18.7	9.7—12.5		17.7—20.6
			2.9,3.8,4.7	4.2,5.1,6.3	5.2,6.1,7.3	5.5,6.6,7.4	6.7,7.3,8.6	6.9,9.0,10.8	7.6,9.3,11.4	8.1,10.2,14.2	10.3,11.0,11.3		
Svetlo-	1			5	1	6	5	7	5	4	1	1	2
gorskii R.	8.3			3.4—5.6	7.2	4.3—10.1	4.7—8.0	4.9—9.5	7.0—16.1	0.9—13.1	4.1	8.9	15.2—20.7
				3.8,3.8,5.5		5.2,6.8,8.3	5.9,7.2,7.6	5.7,8.1,9.2	7.9,8.3,12.0	4.3,8.7,11.3			
Kalin-				5	5	12	8	12	2	7			
kovichskii				3.8—3.8	4.6—9.3	4.3—9.8	4.7—9.8	5.6—11.9	8.0—9.6	3.8—17.6			
R.				3.8,3.8,3.8	5.6,5.6,6.5	5.5,6.9,8.2	5.0,8.2,9.1	6.3,8.2,9.8		5.5,9.6,13.0			
Mozirskii			1			1	1	1	2	1			
R.			7.1			6.4	8.9	7.5	8.2—14.5	15.6			
Elskii R.		19	24	23	12	16	14	9	16	10	11	1	
		2.6—8.9	3.1—12.0	3.4—9.8	3.9—8.3	4.3—9.7	4.7—13.6	5.7—8.5	7.2—13.3	7.6—23.7	9.2—15.0	10.6	
		2.6,2.6,2.6	3.3,3.3,4.8	3.8,3.8,7.3	3.9,3.9,6.3	4.3,5.4,6.9	4.7,4.7,10.3	5.7,5.7,5.7	7.2,8.8,11.2	7.6,7.6,10.3	9.2,9.2.14.2		
Oktyabr-		1		5	2	2	2	2	1	1			
skii R.		7.4		3.8—9.3	6.1—6.9	5.1—9.7	9.6—12.2	8.5—9.2	11.0	13.2			
				4.9,5.2,5.8									
Petrikov-	7	8	7	4	11	11	6	15	5	3	2	1	1
skii R.	4.3—10.3	3.8—6.6	4.1—11.7	3.4—9.7	5.3—14.6	4.1—13.0	4.7—9.6	4.4—15.6	6.0—23.3	7.5—9.1	9.6—15.8	13.3	9.6
	4.9,5.2,5.7	4.6,5.4,6.2	6.4,6.5,11.2	4.4,6.2,8.3	5.8,7.3,9.4	4.3,7.1,10.9	6.0,8.2,9.1	6.7,8.6,11.0	7.4,8.6,8.9	7.5,9.0,9.1			
Lelchitskii	4	5	3	3	3	4	8	7	6	6	5	2	
R.	2.3—6.9	3.8—9.5	5.3—6.4	4.4—8.0	4.5—7.3	6.9—11.3	6.0—13.2	6.9—12.7	0.2—13.7	7.0—16.0	8.9—16.9	15.6—16.3	
	3.8,5.3,6.1	4.2,5.7,6.9	5.3,6.3,6.4	4.4,6.3,8.0	4.5,7.0,7.3	7.5,9.1,10.7	7.1,8.1,8.9	7.0,8.7,9.6	6.7,8.5,9.9	10.4,12.9,14.2	10.2,12.3,15.0		
Zitko-						2			2				1
vichskii R.						6.8—6.9			12.6—13.5				20.4
						6.8,6.8,6.9							
Total	82	293	528	924	1179	1228	1149	1131	1038	880	361	78	44
	2.1—10.3	2.0—9.5	1.9—17.8	2.2—15.1	2.1—14.6	3.3—19.8	0.2—16.0	0.6—20.9	0.2—25.5	0.9—26.2	4.1—31.6	4.3—24.1	7.5—23.3
	2.1,3.1,5.1	2.6,2.6,4.7	3.3,3.8,6.0	3.8,5.1,6.6	4.5,6.2,7.5	5.0,6.6,8.1	5.3,7.3,8.9	6.3,8.2,9.7	7.2,9.2,11.3	7.7,10.3,12.8	9.2,11.1,13.5	10.6,12.5,14.8	11.8,14.2,17.3

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T02. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Gomel region, Belarus. Girls.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Gomel	17[a]	28	121	232	238	262	246	236	212	143	44	31	9
City	1.7–15.6[b]	2.4–8.5	2.8–9.7	3.1–51.9	2.4–12.0	1.8–19.5	3.6–31.6	3.8–40.8	4.4–35.7	4.7–28.7	4.5–21.4	7.9–23.3	2.2–15.3
	5.0,5.7,6.5[c]	2.4,4.9,6.7	4.5,5.3,6.5	4.4,5.9,7.1	4.6,6.2,7.5	5.4,6.9,8.7	6.1,8.3,10.6	7.4,9.5,12.4	8.4,10.6,13.1	9.3,11.5,15.1	9.8,12.4,15.8	10.5,12.5,15.2	8.7,10.7,13.2
Mozir City			1	5	7	11	9	9	10	4	1	1	
			5.6	3.6–5.3	3.5–19.7	4.5–15.1	5.0–13.0	3.4–21.6	8.6–23.3	7.3–26.6	15.2	22.4	
				3.6,3.7,5.0	3.9,6.6,13.1	5.5,8.8,11.2	5.0,5.7,8.6	8.1,10.4,13.1	10.9,14.4,21.6	11.1,15.3,21.2			
Dobrush-	30	81	72	87	64	78	62	61	43	37	14	3	2
skii R.	1.7–6.2	2.3–9.6	2.7–8.1	3.1–11.9	3.7–10.4	3.7–20.4	4.9–19.6	3.7–24.7	5.2–26.7	5.7–17.9	5.1–15.3	8.0–14.2	13.1–13.6
	2.8,3.9,4.8	3.4,4.5,5.2	2.8,4.1,5.3	3.6,5.0,6.3	4.0,5.6,6.9	4.5,6.2,7.4	5.1,6.4,8.6	7.2,8.7,10.7	7.4,8.1,11.0	8.7,10.5,12.0	8.0,10.2,13.6	8.0,11.2,14.2	
Vetkovskii			2	4	4	4	6	7	6	2	2	1	1
R.			4.4–8.4	6.0–12.4	5.1–8.1	5.2–14.5	5.0–11.6	6.2–26.1	3.8–16.9	13.1–18.6	11.7–15.6	12.8	17.3
				6.3,8.0,10.9	5.3,6.4,7.7	5.6,7.2,11.4	5.8,7.3,9.2	6.4,10.1,18.8	9.6,10.4,12.3				
Gomelskii	8	44	165	333	470	505	535	508	473	436	209	26	4
R.	1.7–9.1	2.4–10.3	1.7–9.9	1.2–17.6	1.7–19.7	3.5–20.0	3.0–16.7	3.0–85.0	4.0–26.4	1.7–26.6	6.6–31.7	8.2–17.5	11.8–19.8
	1.7,3.9,5.7	2.4,2.4,4.1	2.8,2.8,5.5	3.6,5.2,6.9	3.9,5.9,7.3	5.4,6.8,8.4	5.6,7.6,9.5	7.2,8.6,10.8	8.3,10.2,12.5	8.4,11.1,13.3	10.2,10.6,12.7	10.3,10.3,11.3	12.1,13.4,17.1
Loevskii		36	24	32	21	39	33	46	19	20	5	3	1
R.		2.4–9.3	2.8–8.9	3.6–9.4	3.9–9.6	4.5–10.6	4.9–21.9	5.0–27.1	7.8–15.7	3.2–26.9	10.2–16.3	11.6–20.2	8.8
		2.4,2.4,2.4	2.8,2.8,2.8	3.6,3.6,3.6	3.9,3.9,4.0	4.5,4.5,6.6	5.0,5.0,6.2	7.2,7.2,9.8	7.8,7.8,10.7	8.4,8.4,12.7	10.2,10.2,10.2	11.6,12.3,20.2	
Braginskii	11	14	25	32	29	26	23	16	16	26	6	1	
R.	1.7–5.1	2.4–4.9	2.8–2.8	3.6–9.7	4.0–11.8	1.6–6.3	4.9–10.7	7.2–9.3	5.2–14.5	7.6–13.1	9.1–10.4	6.4	
	1.7,1.7,1.7	2.4,2.4,2.4	2.8,2.8,2.8	3.6,3.6,4.6	4.0,4.0,4.0	4.5,4.5,4.5	4.9,4.9,4.9	7.2,7.2,7.2	7.8,7.8,7.8	8.3,8.3,8.3	9.6,10.1,10.1		
Checher-		3	3	4	7	9	7	9	10	6	1	1	2
skii R.		5.2–8.6	6.2–6.7	4.5–8.7	5.5–6.6	6.0–11.5	4.6–9.3	6.4–14.4	6.7–17.5	9.3–15.7	12.3	13.7	12.1–15.3
		5.2,5.8,8.6	6.2,6.6,6.7	5.3,6.4,7.7	5.8,6.1,6.3	7.1,7.5,8.7	6.0,6.1,8.1	7.6,8.1,12.0	7.9,10.0,12.7	9.9,11.9,14.3			
Buda-	2	9	15	18	40	64	38	51	44	45	17	11	3
Koshelev-	1.7–1.7	2.4–6.3	2.8–3.5	3.6–10.9	0.8–11.2	4.1–16.4	4.9–13.0	6.7–25.2	7.3–24.8	1.4–27.2	8.4–16.0	9.6–20.1	10.4–21.0
skii R.		2.4,2.4,2.4	2.8,2.8,2.8	3.6,3.6,5.4	4.0,5.9,7.2	5.3,7.7,8.6	5.4,7.3,9.3	7.2,8.9,11.9	7.9,10.8,14.1	8.3,9.7,12.9	10.1,10.8,12.8	11.1,11.6,13.5	10.4,10.9,21.0
Rechitskii	1	3	1	39	88	69	76	75	56	58	23	3	4
R.	3.8	2.4–17.8	5.4	3.1–10.3	3.3–14.3	3.5–13.7	4.8–23.4	6.0–18.2	5.8–19.8	6.4–29.0	7.5–16.1	10.2–12.2	9.7–21.2
		2.4,4.9,17.8		4.6,5.6,6.8	5.3,6.5,7.5	5.8,7.0,8.2	6.3,8.0,9.7	7.6,9.2,10.5	9.2,10.5,15.2	9.6,11.4,13.5	10.0,12.1,14.3	10.2,10.4,12.2	10.7,13.5,18.2
Hoynikskii		7	16	11	85	65	50	56	67	78	50	10	1
R.		2.4–2.4	2.8–14.3	3.6–8.1	3.2–18.1	4.5–14.1	4.1–23.1	5.3–17.8	5.3–27.5	7.6–20.6	7.6–19.7	8.9–14.5	8.7
		2.4,2.4,2.4	2.8,2.8,2.8	3.6,3.6,3.6	3.9,5.4,6.9	5.0,7.1,8.4	6.0,8.3,10.1	7.7,9.5,11.2	7.8,9.0,12.2	8.4,11.1,13.6	10.2,11.1,13.4	10.2,10.8,11.6	
Narov-				1									
lyanskii R.				9.1									

(cont.)

A30-T02. Continued.

Place of residence	Age (years) at the time of examination												
	5	6	7	8	9	10	11	12	13	14	15	16	17
Kor-	1	10	12	8	17	13	8	7	8	5	4	1	1
myanskii	3.0	2.4—5.8	3.1—6.7	3.1—6.3	4.1—10.3	4.5—30.7	5.6—13.1	7.8—13.1	7.6—18.8	7.7—16.3	10.0—14.9	22.0	9.9
R.		3.4,3.9,5.4	4.7,5.4,6.2	4.6,5.0,5.8	5.5,6.9,7.6	6.1,7.1,7.4	6.3,7.2,10.7	8.5,8.8,10.4	10.0,10.6,11.8	11.2,11.5,14.3	10.3,10.7,12.9		
Roga-			1	40	46	54	36	44	40	26	12	6	
chevskii			2.8	3.0—11.0	3.5—11.2	3.7—17.7	5.0—19.8	4.0—19.3	5.7—18.6	7.4—25.5	6.5—34.8	9.8—22.6	
R.				4.9,5.9,6.5	5.6,6.2,7.4	6.4,7.4,8.9	6.8,8.0,10.8	7.8,9.5,11.4	8.4,9.8,13.0	9.5,12.9,15.1	10.5,12.4,15.1	11.0,12.3,13.3	
Zlobinskii			3	34	39	49	36	22	34	28	12	3	2
R.			2.8—5.0	3.6—10.9	3.0—11.4	3.5—14.2	3.8—14.1	5.0—18.3	7.4—24.9	7.0—23.3	11.1—19.5	8.9—11.7	15.1—15.7
			2.8,3.4,5.0	4.3,5.7,8.1	4.6,5.7,7.0	5.5,6.9,7.8	6.5,8.1,9.8	7.2,8.0,11.2	9.6,11.3,13.0	9.8,13.6,15.8	12.5,14.7,16.2	8.9,10.2,11.7	
Svetlo-			1	1	6	5	8	7	12	4	1		9
gorskii R.			3.5	3.6	5.8—13.4	4.5—11.4	4.0—10.5	6.2—9.7	7.8—21.8	8.4—22.5	12.4		8.0—15.2
					6.1,6.8,9.4	5.4,5.5,10.0	5.7,6.5,8.7	7.2,7.2,7.5	8.8,10.7,13.8	8.9,10.7,17.2			8.6,12.3,13.9
Kalin-	1		2	1	5	6	10	5	8	5	1		1
kovichskii	5.9		5.0—8.3	3.6	6.1—11.5	4.5—9.2	5.0—10.0	7.2—13.3	5.4—27.7	7.1—16,8	8.7		14.7
R.					6.4,7.2,7.5	7.6,8.0,9.1	5.0,7.5,8.2	7.9,9.3,11.5	8.4,9.9,16.1	8.4,9.7,14.5			
Mozirskii			1	4	3	5	1	3	1	1			
R.			5.3	3.6—4.5	5.5—9.4	4.5—11.8	17.7	6.7—7.5	18.3	14.1			
				3.6,4.0,4.5	5.5,6.7,9.4	7.0,8.6,9.3		6.7,7.2,7.5					
Elskii R.		23	28	17	23	22	22	21	16	20	15	1	
		2.4—6.0	2.8—8.4	3.6—10.6	3.9—14.1	4.5—16.4	4.9—13.9	6.1—20.0	7.6—17.6	8.4—15.5	9.5—15.9	20.0	
		2.4,2.4,2.4	2.8,2.8,2.8	3.6,3.6,6.2	3.9,5.7,8.9	4.5,4.5,8.5	5.0,5.0,9.0	7.2,7.2,8.3	7.8,7.8,9.7	8.4,8.5,12.0	10.2,10.2,10.2		
Oktyabr-			1	1		5	2	5	6	2	1	1	1
skii R.			5.8	4.4		4.5—16.3	9.7—9.7	8.6—10.3	7.7—19.1	8.4—15.8	12.2	12.0	16.0
						7.2,7.6,8.1		9.0,9.2,9.8	10.3,14.2,15.0				
Petrikov-	14	14	14	10	10	5	14	12	8	10	1	2	2
skii R.	3.3—8.2	3.5—8.7	4.4—10.0	3.6—20.9	3.2—13.1	4.5—17.7	6.3—14.3	6.9—16.0	6.8—19.0	8.2—32.2	9.7	13.2—14.3	14.3—17.3
	3.9,5.6,6.5	5.5,6.1,7.2	5.2,6.5,6.8	5.7,9.4,12.0	3.9,7.1,11.4	6.5,7.4,13.2	7.1,8.0,9.2	8.4,10.9,14.1	9.5,11.9,14.4	11.7,16.2,24.0			
Lelchitskii	5	7	2	6	9	7	15	4	11	14	10	5	5
R.	4.1—15.3	3.0—7.2	4.4—5.9	3.6—8.1	3.9—11.1	6.5—11.9	5.0—11.8	7.2—22.0	7.8—17.5	8.4—14.9	6.3—17.4	12.9—21.2	10.9—20.2
	4.4,4.8,7.9	4.8,5.3,6.9		5.3,6.1,6.7	5.1,6.1,8.0	7.9,8.1,8.4	6.1,7.5,10.0	7.2,7.9,15.3	9.5,11.9,13.3	9.2,9.9,11.0	9.6,11.6,14.5	13.1,14.9,15.6	14.9,15.5,17.8
Zitko-				1		3	1	5		3			
vichskii R.				8.5		4.7—7.0	5.7	5.9—14.4		9.5—16.5			
						4.7,5.8,7.0		8.2,8.7,13.2		9.5,13.7,16.5			
Total	91	279	513	925	1222	1313	1245	1215	1111	978	431	110	48
	1.7—15.6	2.3—17.8	1.7—14.3	1.2—51.9	0.2—19.7	1.6—30.7	3.0—31.6	3.0—85.0	3.8—35.7	1.4—32.2	4.5—34.8	6.4—23.3	2.2—21.2
	2.5,4.1,5.7	2.4,3.0,5.2	2.8,3.8,5.8	3.6,5.3,6.8	4.0,6.0,7.3	5.1,6.8,8.4	5.7,7.6,9.7	7.2,8.7,11.2	8.0,10.3,12.8	8.4,11.0,13.6	10.2,11.0,13.5	10.3,11.6,14.2	10.3,13.1,15.3

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T03. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys.

Place of residence	Age (years) at the time of examination												
	5	6	7	8	9	10	11	12	13	14	15	16	17
Mogilev	19[a]	94	376	486	627	652	714	630	560	686	406	217	48
City	3.0—5.9[b]	2.8—7.6	2.9—10.9	2.6—16.9	2.7—14.3	3.0—16.2	1.3—17.7	3.9—22.1	4.0—24.3	3.6—32.3	6.0—28.9	5.8—34.9	5.7—22.8
	3.7,4.8,5.2[c]	4.3,4.7,5.2	4.9,5.7,6.7	5.0,6.0,7.0	5.5,6.9,8.1	5.9,7.1,8.7	6.6,8.1,9.6	7.7,9.3,11.0	8.3,10.1,12.3	10.0,11.9,14.5	10.8,13.0,15.8	11.9,14.0,16.5	13.6,15.3,17.4
Bobruisk			2	2			1	1					
City			6.3—6.8	5.9—8.4			8.6	12.7					
Hotimskii			1	7	16	16	4	5	2	3			
R.			4.2	4.4—10.8	5.2—9.5	5.1—10.4	6.5—10.2	7.8—14.2	9.7—11.2	9.4—11.0			
				4.5,5.6,7.6	6.4,7.2,8.1	6.7,7.3,7.6	6.5,7.2,9.0	7.9,9.1,9.6		9.4,10.0,11.0			
Klimo-	3	5	8	15	33	29	41	40	51	30	12	8	
vichskii R.	4.3—7.0	3.4—5.4	3.3—6.9	4.0—8.6	4.3—11.3	4.7—14.8	5.0—15.2	4.4—16.5	6.1—17.5	5.9—17.5	8.0—20.2	9.9—18.4	
	4.3,5.1,7.0	3.9,4.0,4.0	3.8,4.7,5.8	5.2,6.3,7.3	5.9,6.7,7.3	6.2,7.1,9.3	6.7,8.1,9.0	7.6,9.4,11.8	8.7,10.4,11.5	9.6,10.7,12.7	10.8,13.3,15.5	10.9,12.3,13.9	
Kostyu-		25	14	5	21	21	29	42	51	26	13	3	
kovichskii		2.4—6.5	3.1—7.2	3.5—9.2	3.3—8.9	3.7—9.9	4.4—13.2	2.4—17.1	4.4—13.6	5.4—18.8	6.5—20.2	12.8—24.0	
R.		3.0,3.7,4.7	4.4,5.6,6.1	4.1,4.4,4.5	5.3,6.3,6.9	5.3,6.6,7.4	6.5,7.2,8.6	5.9,8.0,9.7	7.1,8.3,9.6	8.3,10.6,12.3	9.2,11.0,12.2	12.8,13.8,24.0	
Mstislav-							1						
skii R.							8.5						
Krichev-	17	35	28	26	18	9	1		3	3	2		
skii R.	3.4—7.6	3.1—8.2	3.4—8.9	4.2—10.0	4.9—12.5	6.3—11.7	8.3		9.3—14.2	9.6—14.8	7.1—22.4		
	4.4,5.3,6.0	5.2,6.0,6.9	5.1,5.7,6.9	5.8,6.3,8.1	6.7,7.7,9.0	7.9,8.6,10.3			9.3,9.7,14.2	9.6,13.9,14.8			
Cheri-		9	16	47	57	82	67	51	47	27	30	18	3
kovskii R.		3.3—6.7	3.8—5.7	3.9—9.4	3.4—9.4	4.4—20.9	1.0—12.0	5.9—16.9	6.0—20.0	7.1—17.0	8.4—26.4	8.0—27.5	13.8—19.6
		4.1,4.6,5.3	4.2,4.6,5.2	5.2,6.4,7.6	5.2,6.2,7.1	6.0,7.3,8.8	6.3,7.8,9.8	7.2,8.4,9.7	8.1,9.4,11.8	8.8,9.9,11.7	9.7,11.7,13.7	12.2,14.6,15.8	13.8,14.0,19.6
Krasno-		17	12	36	101	134	111	103	94	95	86	57	16
polskii R.		1.9—5.1	3.0—7.6	4.0—9.6	3.2—10.9	4.2—13.0	4.3—13.9	5.1—15.6	4.7—15.5	5.2—23.6	6.4—25.1	5.9—24.6	8.7—19.4
		3.4,4.0,4.2	3.8,4.6,6.3	5.7,6.5,7.2	6.0,7.2,8.2	6.4,7.7,9.1	7.2,8.3,9.4	7.9,9.2,10.8	8.6,9.8,12.2	9.0,11.0,13.0	10.7,12.7,14.8	11.1,12.9,15.9	10.7,11.8,14.3
Goretskii						2	1	4	1	4			
R.						10.0—10.0	10.3	8.0—15.5	13.8	9.9—15.6			
								8.5,11.1,14.4		9.9,12.6,15.4			
Chausskii	15	58	65	113	108	129	134	79	96	71	43	17	2
R.	2.5—7.6	2.0—8.5	3.4—9.9	2.7—13.3	2.9—18.5	4.9—12.6	4.8—15.9	4.2—19.8	5.2—23.9	5.6—25.4	5.2—28.7	8.4—23.5	5.4—20.8
	3.6,4.0,6.4	4.2,4.8,5.4	4.8,5.7,6.9	5.7,7.3,8.7	6.5,7.5,9.1	7.0,8.4,9.6	7.6,8.9,10.5	7.7,9.7,11.5	9.6,11.5,13.9	9.4,11.2,14.2	10.5,14.6,17.6	11.7,14.0,19.8	
Slavgor-	16	15	22	16	25	29	32	41	46	27	6	2	
odskii R.	2.4—6.4	2.5—8.4	3.8—10.6	3.4—9.4	2.0—12.7	3.5—10.4	4.7—13.0	5.1—16.7	4.3—19.3	6.6—25.1	8.9—16.5	14.0—16.7	
	3.9,4.9,5.6	4.2,5.2,6.0	4.5,5.4,6.7	4.5,6.2,7.4	5.4,6.7,8.9	6.4,7.8,8.6	7.4,8.9,10.3	7.9,9.6,11.4	8.5,10.2,11.6	9.1,11.5,14.6	9.9,12.3,15.4		

(cont.)

A30-T03. Continued.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Shklovskii R.						1 9.0		1 9.2					
Mogilevskii R.		33 2.7—8.5 4.2,4.6,5.2	110 2.6—10.1 4.5,5.2,6.4	114 3.4—11.6 4.9,5.9,6.8	175 2.6—13.0 5.6,6.6,7.6	196 3.6—17.2 5.9,7.1,8.6	176 4.2—15.7 6.5,7.4,9.1	210 3.2—16.9 7.4,9.0,11.1	180 5.3—27.7 7.1,8.9,11.4	180 4.9—20.6 8.8,10.8,12.8	86 6.5—26.3 10.7,13.2,17.4	43 7.2—19.7 11.2,13.9,15.8	4 9.3—25.1 11.0,16.3,22.5
Bykhovskii R.	35 3.5—7.0 4.1,4.8,5.4	44 2.6—8.6 4.2,5.4,6.1	49 3.3—10.6 5.1,5.9,6.8	54 3.7—13.0 5.4,6.2,7.3	101 3.3—15.5 6.4,7.6,9.1	132 4.3—20.3 6.5,7.8,9.2	122 4.5—17.4 7.2,8.2,9.9	149 4.5—18.6 8.1,9.5,11.7	147 5.5—21.6 9.0,10.7,13.0	123 5.4—23.4 9.7,11.8,14.7	133 6.3—30.1 11.1,13.6,16.1	72 7.3—28.4 12.3,14.9,18.6	12 7.2—24.7 11.4,17.9,20.2
Kruglianskii R.								1 12.1					
Belynichskii R.				1 9.5		1 10.3				1 13.8			
Klichevskii R.		4 3.9—5.5 4.0,4.1,4.8	4 4.8—6.5 5.1,5.8,6.3	4 3.4—8.0 4.2,5.6,7.1	7 4.3—8.4 4.4,5.5,7.6	10 3.9—15.1 6.5,7.3,8.8	10 6.1—11.2 6.6,7.3,8.0	9 6.4—15.4 7.5,8.4,9.8	2 8.3—8.9	8 6.4—14.6 7.3,9.0,9.7	2 9.4—15.2		
Kirovskii R.						1 8.4							
Bobruiskii R.			1 7.0	1 6.1		2 10.7—11.2	1 6.3	1 6.3	1 8.7				
Osipovichskii R.							1 6.8				1 14.9		1 10.2
Glusskii R.			3 4.9—6.3 4.9,5.5,6.3	2 5.6—8.9	5 4.7—8.2 5.2,5.4,5.4	2 6.2—13.1	9 6.3—12.4 7.0,7.9,10.0		2 6.6—17.2	3 9.4—19.6 9.4,12.6,19.6	1 12.7	1 28.1	
Total	105 2.4—7.6 3.8,4.8,5.5	339 1.9—8.6 4.1,4.8,5.6	712 2.6—10.9 4.7,5.6,6.7	930 2.6—16.9 5.1,6.2,7.4	1296 2.0—18.5 5.7,6.9,8.1	1452 3.0—20.9 6.1,7.4,8.9	1455 1.0—17.7 6.7,8.1,9.7	1371 2.4—22.1 7.6,9.2,11.1	1284 4.0—27.7 8.3,10.0,12.2	1287 3.6—32.3 9.5,11.5,14.1	824 5.2—30.1 10.7,13.1,15.9	438 5.8—34.9 11.7,14.0,16.5	86 5.4—25.1 11.8,14.8,17.7

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T04. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls.

Place of residence	Age (years) at the time of examination												
	5	6	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	13[a]	78	345	496	619	677	761	662	590	710	451	319	57
	3.0—5.5[b]	2.2—8.8	2.3—9.7	2.3—18.4	0.2—18.0	3.0—20.9	2.8—35.3	2.6—28.1	3.7—25.7	4.6—33.3	3.8—35.3	6.1—27.5	6.9—21.9
	3.6,4.0,4.8[c]	4.0,4.5,5.5	4.6,5.6,6.5	4.9,5.9,6.9	5.5,6.6,7.9	6.0,7.4,9.0	7.0,8.4,10.3	8.5,10.2,12.7	8.9,11.0,13.6	9.8,11.9,14.4	10.9,13.2,15.6	11.6,13.5,15.7	11.9,13.3,16.1
Bobruisk City			1	1			2						
			10.4	6.4			9.3—9.9						
Hotimskii R.				2	6	10	2	2	6	1	1		
				7.0—8.0	4.7—7.0	4.4—11.9	5.3—9.4	7.6—8.1	6.6—17.0	7.9	11.8		
					4.8,6.1,6.4	6.6,6.8,7.6			7.9,9.8,12.1				
Klimovichskii R.	6	4	3	12	24	31	48	28	53	29	25	8	
	2.5—6.5	4.4—6.0	5.4—6.6	4.5—9.2	5.3—12.8	4.3—10.4	4.9—15.1	6.2—18.0	6.6—20.9	7.6—18.3	7.7—18.0	8.9—24.5	
	3.5,3.9,4.2	4.4,4.9,5.6	5.4,5.5,6.6	5.1,6.1,6.7	6.5,7.2,8.4	6.2,7.6,9.3	7.3,8.4,10.7	8.0,10.4,12.8	9.8,12.0,14.0	9.6,11.4,14.1	11.8,12.4,14.9	12.5,14.2,16.2	
Kostyukovichskii R.		20	6	17	14	25	42	64	46	26	12	13	
		2.0—4.8	3.0—7.4	3.3—7.9	3.7—13.3	3.6—13.4	4.2—14.7	2.7—16.3	5.9—18.0	5.8—20.6	5.4—27.8	8.8—22.2	
		3.4,3.7,4.3	3.6,4.6,5.8	4.1,5.1,6.0	4.8,5.5,7.1	5.6,7.2,8.2	5.7,7.4,9.4	8.1,9.5,11.3	8.5,9.6,12.0	9.2,10.6,12.7	9.5,11.7,13.8	10.9,12.5,16.9	
Mstislavskii R.													
Krichevskii R.	24	32	30	22	13	18	3	1	5	4	3		
	3.2—7.3	4.2—6.8	4.2—10.1	3.5—9.8	4.9—11.5	5.4—11.7	7.7—12.8	10.5	9.2—16.9	7.9—17.2	11.9—23.2		
	4.6,5.3,5.8	4.8,5.3,5.7	5.5,6.3,7.5	4.9,5.9,6.9	6.2,7.1,9.1	7.6,8.5,9.5	7.7,12.5,12.8		10.2,10.8,13.6	9.0,12.6,16.2	11.9,15.4,23.2		
Cherikovskii R.		14	14	42	84	76	63	77	47	30	40	14	5
		2.6—6.5	3.1—7.8	3.5—9.5	3.8—13.0	3.8—15.1	4.3—16.1	5.3—21.3	5.4—22.9	6.2—26.7	7.9—20.9	6.5—24.4	8.7—23.1
		3.6,4.2,5.0	3.9,4.3,5.8	4.8,5.6,6.5	5.5,6.2,7.3	5.8,7.2,9.4	6.9,8.1,9.3	8.0,9.2,11.2	8.2,9.4,11.9	11.2,12.8,15.7	10.6,12.3,14.2	9.2,11.3,13.9	10.2,12.8,17.6
Krasnopolskii R.		19	11	36	107	127	88	98	102	92	90	54	19
		2.3—6.5	2.6—7.8	3.3—12.3	3.8—12.1	3.6—18.6	5.2—17.2	4.4—18.3	5.7—20.9	6.3—25.4	6.7—25.6	6.1—24.1	9.5—19.9
		3.4,4.0,5.4	3.6,5.0,6.9	5.0,6.1,7.4	5.7,6.9,8.6	6.3,7.4,9.3	7.8,9.7,11.4	8.0,9.9,11.8	9.5,10.7,13.2	9.5,11.6,13.9	10.3,12.0,14.8	10.7,13.1,15.5	11.5,13.7,15.0
Goretskii R.		1			2	4	4	4	2	1	2	2	
		4.1			9.0—11.5	5.9—11.8	9.0—13.3	9.3—16.7	7.7—12.4	10.2	10.0—14.4	13.9—22.1	
						7.1,8.6,10.3	9.0,10.2,12.3	9.5,12.9,16.4					
Chausskii R.	14	52	67	119	107	142	140	90	138	70	41	10	3
	1.9—5.3	2.4—8.0	2.6—15.6	3.2—11.3	3.4—18.3	2.9—20.1	4.2—16.5	4.4—23.3	4.8—24.7	6.0—27.9	6.4—19.5	7.5—20.3	10.0—18.4
	3.2,3.8,4.9	3.6,4.3,5.3	4.4,5.6,7.0	5.8,6.9,8.6	5.8,7.1,9.1	7.2,8.5,9.9	7.5,9.2,11.0	9.4,11.1,13.3	10.6,12.3,14.7	10.4,12.8,15.0	9.5,13.0,15.5	9.4,11.4,15.3	10.0,11.1,18.4
Slavgorodskii R.	13	21	18	18	20	37	40	46	35	33	9		
	3.3—7.2	3.2—7.8	4.3—8.3	3.5—10.1	4.2—12.8	3.9—14.5	4.1—17.6	4.1—16.2	4.0—17.4	4.5—25.5	4.4—19.2		
	3.8,4.3,5.9	3.7,4.4,4.8	4.9,5.6,6.1	4.5,4.9,7.3	5.2,6.7,8.0	7.0,8.4,9.6	8.0,9.5,11.3	8.8,10.1,12.7	9.1,11.4,13.2	9.6,12.7,15.5	10.7,12.7,15.4		
Shklovskii R.					2	1	2		2				
					5.0—6.9	8.4	9.0—11.1		10.3—14.8				

(cont.)

A30-T04. Continued.

Place of residence	Age (years) at the time of examination												
	5	6	7	8	9	10	11	12	13	14	15	16	17
Mogilev-		31	96	118	161	173	196	194	170	147	126	69	7
skii R.		2.8—9.3	3.1—10.8	3.2—10.2	3.1—11.7	3.9—14.4	3.8—18.7	3.6—22.5	4.9—21.9	5.8—24.6	6.1—19.9	7.1—29.6	9.8—19.7
		4.0,4.7,5.2	4.4,5.1,6.1	4.7,5.4,6.7	5.4,6.4,7.5	6.2,7.3,8.8	6.8,8.2,9.9	7.8,9.6,11.2	8.7,10.5,12.9	9.5,11.7,13.6	10.0,12.3,14.8	10.0,12.4,14.5	11.5,15.8,17.5
Bykhov-	35	42	48	70	108	128	167	164	143	120	128	99	10
skii R.	2.2—9.6	2.7—10.9	3.2—10.7	3.8—11.7	4.3—16.2	4.1—16.1	3.9—24.6	5.7—23.4	4.7—24.4	5.8—33.3	4.4—28.1	7.9—30.7	8.0—27.6
	3.8,5.2,6.1	4.4,5.5,6.4	5.1,6.0,6.8	5.6,6.7,7.8	5.8,6.8,8.4	6.3,7.7,9.2	7.4,9.0,10.6	8.2,10.1,12.3	9.0,10.7,13.0	10.4,12.2,13.9	10.4,13.0,15.6	11.3,13.7,17.0	11.0,14.1,16.8
Kruglian-												1	
skii R.												11.4	
Belynich-				1			1		2				
skii R.				8.8			14.5		9.2—14.6				
Klichev-		3	5	6	2	11	7	8	2	6	1	3	
skii R.		2.4—3.5	3.6—4.6	4.9—8.7	5.9—10.4	3.9—10.3	6.1—15.0	5.7—15.0	7.7—14.5	5.6—16.8	10.4	8.0—20.6	
		2.4,3.1,3.5	4.1,4.4,4.5	5.0,5.7,8.1		5.7,7.4,7.8	6.5,8.5,12.9	7.2,8.7,13.1		7.7,13.1,16.2		8.0,12.0,20.6	
Kirovskii							1			1			
R.							12.6			11.4			
Bobruiskii			1	2	1	2	5	3		1			
R.			5.7	8.1—9.1	4.4	4.8—8.0	6.2—22.0	7.8—9.6		8.1			
							6.7,7.5,8.1	7.8,9.4,9.6					
Osipo-							2				1		
vichskii R.							9.6—13.9				17.4		
Glusskii			2	1	1	2	6	5	4	1	2	1	
R.			3.9—4.8	4.5	7.5	8.3—10.0	6.9—10.7	6.8—12.2	8.3—14.9	13.1	15.6—16.8	17.2	
							7.9,8.1,10.7	6.8,9.7,10.4	8.9,11.0,13.6				
Total	105	317	648	964	1275	1469	1581	1449	1351	1275	937	596	101
	1.9—9.6	2.0—10.9	2.3—15.6	2.3—18.4	0.2—18.3	2.9—20.9	2.8—35.3	2.6—28.1	3.7—25.7	4.5—33.3	3.8—35.3	6.1—30.7	6.9—27.6
	3.8,4.9,5.6	3.9,4.6,5.5	4.6,5.6,6.6	5.0,6.0,7.2	5.5,6.7,8.0	6.2,7.6,9.2	7.1,8.6,10.5	8.3,10.0,12.2	9.1,11.0,13.4	9.8,11.9,14.4	10.6,12.8,15.4	11.2,13.4,15.7	11.5,13.5,16.2

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T05. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Klincy	103[a]	187	365	573	647	600	633	623	648	674	394	66	46
City	1.7—7.3[b]	1.9—9.4	0.4—14.5	2.2—12.9	3.3—42.4	3.3—18.2	0.3—21.2	3.3—24.4	4.3—28.3	4.1—37.2	2.5—43.7	7.9—37.6	9.5—39.8
	3.3,4.1,4.7[c]	3.9,4.6,5.5	5.0,6.2,7.5	5.7,6.9,8.3	6.3,7.5,9.0	6.7,8.1,9.5	7.3,8.8,10.8	7.9,9.7,11.7	9.6,11.5,13.9	11.3,13.6,16.7	12.5,14.6,17.8	13.2,15.8,19.8	15.7,19.3,22.7
Gordeev-				26	78	86	97	110	87	87	57	29	2
skii R.				4.3—13.2	4.2—15.1	4.6—25.0	4.7—17.4	6.0—25.9	5.7—28.3	7.2—26.1	7.3—34.0	7.7—28.0	15.0—16.8
				6.4,8.3,9.1	6.5,7.8,9.1	7.3,8.3,10.2	7.8,9.2,11.3	8.9,10.7,13.3	9.6,11.7,14.4	11.3,13.4,15.9	11.7,13.9,16.6	12.2,14.3,18.1	
Klintsov-	1	17	63	56	65	67	59	78	75	51	60	28	7
skii R.	4.6	3.1—6.5	3.0—10.9	3.7—12.4	3.8—15.1	1.0—19.9	5.2—15.3	5.9—25.6	5.5—31.3	1.3—25.4	8.6—38.5	9.7—31.7	1.0—26.7
		4.1,4.8,5.2	5.0,5.9,6.9	5.9,7.0,8.3	6.5,7.6,9.5	6.5,8.2,9.8	8.0,9.9,11.5	7.9,9.4,11.6	9.0,10.6,13.2	10.9,13.4,19.4	12.9,15.6,19.8	15.7,17.9,21.1	14.4,19.9,25.9
Novo-			57	172	176	154	169	173	189	164	76	48	16
zybkovskii			3.6—13.0	3.4—17.3	3.9—18.2	4.5—17.5	5.2—19.5	4.7—17.8	4.0—35.1	2.6—26.6	6.5—30.9	7.1—30.0	11.0—24.6
R.			5.3,6.7,7.8	6.6,7.7,9.0	7.1,8.4,10.0	7.4,9.0,10.3	8.1,9.7,11.4	8.3,10.1,12.3	10.2,12.5,14.5	12.1,14.6,17.2	13.2,15.8,19.2	14.3,17.9,21.2	13.8,15.7,17.9
Zlynkov-			12	75	82	103	95	99	98	91	65	69	23
skii R.			5.7—13.3	4.5—17.1	4.9—16.8	4.6—18.7	5.8—20.0	5.8—23.6	5.8—23.3	6.4—35.1	9.3—28.0	8.5—26.7	9.9—27.4
			7.6,8.6,9.2	6.9,8.4,10.0	7.6,8.9,10.2	7.9,9.6,11.3	8.7,10.6,12.3	8.7,10.9,13.4	10.1,11.5,15.1	11.1,13.1,17.1	12.7,14.6,17.5	12.7,15.3,18.2	14.2,16.3,19.0
Krasno-					55	120	114	125	161	106	64	27	9
gorskii R.					4.1—14.2	4.5—14.4	5.9—22.6	3.9—21.6	3.5—27.7	6.7—36.4	5.0—36.4	10.3—31.5	14.6—22.6
					6.7,8.2,9.6	7.5,8.9,10.4	8.1,9.3,11.2	9.2,11.1,13.5	10.5,12.3,14.7	11.4,14.3,17.6	12.4,15.6,18.3	13.2,15.3,18.5	16.2,19.2,21.3
Total	104	204	497	902	1103	1132	1169	1209	1259	1173	716	267	103
	1.7—7.3	1.9—9.4	0.4—14.5	2.2—17.3	3.3—42.4	1.0—25.0	0.3—22.6	3.3—25.9	3.5—35.1	1.3—37.2	2.5—43.7	7.1—37.6	1.0—39.8
	3.3,4.1,4.7	3.9,4.6,5.5	5.1,6.2,7.5	6.0,7.2,8.6	6.5,7.9,9.4	7.0,8.5,10.0	7.7,9.2,11.1	8.2,10.0,12.3	9.8,11.7,14.3	11.4,13.7,16.9	12.5,14.7,18.0	13.2,16.1,19.6	14.9,17.5,21.6

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T06. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls.

Place of residence	Age (years) at the time of examination: 5	6	7	8	9	10	11	12	13	14	15	16	17
Klincy	105[a]	154	333	505	599	651	564	613	613	682	557	97	108
City	0.7—8.2[b]	1.8—11.0	1.9—12.5	1.8—16.4	3.2—21.8	3.1—19.4	3.2—34.8	1.0—34.4	3.0—33.0	1.0—37.2	6.2—40.0	7.9—40.0	3.0—28.5
	3.0,3.7,4.5[c]	3.7,4.8,5.9	4.9,6.1,7.2	5.5,6.7,7.9	6.3,7.4,8.9	7.1,8.4,10.1	7.8,9.6,11.7	9.3,11.6,13.9	10.7,12.8,15.8	11.4,13.9,17.1	12.1,14.3,17.4	12.8,15.8,18.6	14.7,17.2,20.5
Gordeev-		1		34	80	97	91	80	81	80	67	74	3
skii R.		11.5		3.9—19.6	3.8—13.6	3.9—16.7	5.1—19.4	4.5—23.8	6.3—28.5	5.7—47.5	7.4—26.5	7.2—27.8	12.2—18.6
				5.5,6.7,9.0	6.2,7.7,9.2	7.3,8.4,10.1	7.6,9.6,12.1	8.8,10.9,13.5	10.4,12.9,16.2	11.3,13.7,16.7	11.3,13.7,17.2	11.5,13.9,16.5	12.2,12.8,18.6
Klintsov-	1	16	53	60	57	64	62	59	61	58	42	31	11
skii R.	6.2	3.4—7.5	3.5—11.3	4.3—13.1	4.0—19.7	4.9—18.0	4.7—20.4	5.7—18.6	5.8—150.0	6.5—29.2	7.4—28.0	9.2—31.7	10.5—27.1
		3.7,4.8,5.5	4.7,5.6,7.1	6.2,7.2,8.6	6.0,6.6,8.2	6.7,8.3,9.7	7.1,9.1,10.9	9.4,11.3,13.0	10.8,13.5,17.0	11.5,14.6,16.8	12.2,14.7,18.1	13.1,16.9,19.7	15.1,17.6,21.6
Novo-			64	157	163	176	179	163	154	167	84	77	17
zybkovskii			4.2—12.7	4.3—22.9	3.5—21.4	4.8—19.2	4.9—26.8	5.9—39.8	3.2—28.1	6.9—37.7	8.5—24.6	6.7—32.1	8.8—21.8
R.			6.2,7.1,8.0	6.4,7.3,9.0	7.2,8.2,9.7	8.0,9.3,11.0	8.8,10.5,13.3	10.3,12.3,14.8	11.9,14.2,16.7	12.4,14.8,17.8	12.1,15.2,18.1	12.6,14.6,18.8	11.3,14.3,17.5
Zlynkov-			13	104	95	106	98	110	86	78	85	79	22
skii R.			4.2—11.0	4.0—14.6	2.4—15.8	5.4—21.6	6.1—30.2	4.2—26.9	5.5—24.1	4.5—29.1	7.4—30.3	6.0—37.6	11.0—26.1
			7.0,7.5,8.7	6.5,7.8,9.4	7.5,9.0,10.6	8.1,9.6,11.5	9.3,11.1,12.6	9.3,12.1,14.9	10.0,12.4,16.1	12.5,14.0,16.6	11.1,13.8,17.2	11.4,13.2,15.5	11.8,14.2,18.5
Krasno-						120	122	132	129	116	74	38	22
gorskii R.						4.4—21.1	5.5—25.3	1.3—30.7	2.2—27.9	7.2—39.5	8.4—29.0	10.3—24.8	10.1—23.1
						7.7,8.8,10.1	8.4,10.1,12.0	9.4,11.5,13.8	11.1,13.7,15.9	12.3,14.4,16.5	12.7,15.2,18.1	13.2,15.6,19.8	12.9,14.6,18.4
Total	106	171	463	861	1054	1216	1118	1158	1126	1183	914	397	183
	0.7—8.2	1.8—11.5	1.9—12.7	1.8—22.9	2.4—21.8	3.1—22.2	3.2—34.8	1.0—39.8	2.2—150.0	1.0—47.5	6.2—40.0	6.0—40.0	3.0—28.5
	3.0,3.7,4.5	3.7,4.9,5.9	5.0,6.3,7.3	5.9,6.9,8.4	6.4,7.8,9.3	7.4,8.7,10.4	8.1,9.8,12.0	9.4,11.6,14.0	10.8,13.1,16.0	11.8,14.1,17.1	12.0,14.4,17.6	12.1,14.6,18.2	13.6,16.6,19.7

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T07. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys.

Place of residence	Age (years) at the time of examination												
	5	6	7	8	9	10	11	12	13	14	15	16	17
Kiev City		1	8[a]	42	49	55	63	48	49	43	10	14	1
		7.1	6.3—9.2[b]	5.5—11.6	6.1—14.5	5.3—17.1	5.3—16.3	8.0—16.9	7.0—25.4	6.5—20.4	10.6—22.8	8.2—20.9	18.7
			6.5,7.4,8.3[c]	7.3,8.1,9.1	7.8,8.6,9.7	7.3,8.6,10.6	8.3,9.7,11.3	9.8,11.0,12.5	10.6,12.0,14.3	11.6,14.0,16.8	13.7,17.0,20.8	11.4,13.9,17.6	
Polesskii R.	3	15	50	60	45	44	33	25	34	28	19	14	
	4.9—8.8	2.6—9.4	5.2—11.6	5.7—16.2	5.3—14.5	6.4—16.7	7.3—14.8	7.6—17.3	8.2—17.4	9.3—23.9	9.2—19.8	10.8—20.5	
	4.9,5.3,8.8	5.0,5.8,7.0	7.0,8.2,9.3	7.6,8.5,10.4	7.9,8.4,10.4	8.7,9.7,11.1	9.4,10.3,10.9	10.3,10.7,12.1	10.6,11.8,13.4	11.9,13.0,16.0	13.1,16.0,18.3	14.9,16.0,18.1	
Ivankovskii R.	9	57	55	84	78	57	62	45	51	68	45	17	1
	5.7—9.2	4.2—11.8	5.2—18.8	5.8—20.5	4.9—14.5	6.8—18.4	6.2—16.9	6.7—22.1	8.5—25.4	5.8—28.6	9.4—26.2	10.5—27.0	18.6
	6.0,6.8,7.7	5.9,6.6,7.4	6.5,7.8,8.7	7.8,8.6,9.8	8.4,9.3,10.4	8.5,9.8,11.2	9.1,10.5,12.7	9.9,11.4,12.4	10.8,12.4,14.2	12.1,14.2,16.5	14.7,17.3,20.5	13.5,16.9,17.8	
Borodyanskii R.	3	20	29	89	134	174	141	103	105	91	40	22	1
	4.7—6.7	5.1—9.2	5.9—10.5	4.3—17.1	4.7—14.2	5.2—15.1	5.8—18.2	6.3—18.0	6.9—19.0	8.2—23.0	7.9—22.1	11.5—33.9	18.7
	4.7,6.3,6.7	5.6,6.2,7.3	6.7,7.2,8.1	6.7,7.7,9.0	7.4,8.5,9.6	8.1,9.1,10.4	8.4,9.7,11.2	9.0,10.3,11.7	10.0,11.8,14.2	11.2,13.0,16.4	13.8,15.6,17.3	14.3,16.6,20.4	
Vishgorodskii R.	2	12	92	140	134	163	151	137	166	169	96	66	20
	7.6—11.8	5.4—30.5	4.8—11.7	4.6—14.2	5.0—17.3	5.6—17.2	6.3—21.2	5.8—25.9	6.6—33.3	7.3—30.2	9.8—29.0	11.5—31.6	15.0—23.9
		6.5,8.2,12.3	6.6,7.5,8.6	7.3,8.3,9.9	8.1,9.5,11.2	8.8,9.7,11.4	9.1,10.5,12.3	9.9,11.7,13.2	11.4,13.2,15.6	12.4,14.6,17.6	14.6,17.1,20.0	15.4,18.5,21.7	16.5,19.0,20.3
Irpenskii R.		3	66	123	231	395	425	446	402	445	194	121	15
		4.6—9.4	4.1—11.7	4.5—17.3	4.4—16.4	4.9—16.8	4.7—22.1	5.5—26.2	5.9—24.3	6.6—32.6	6.8—25.2	7.8—35.1	10.6—29.3
		4.6,5.9,9.4	5.5,6.6,7.7	6.8,7.7,8.7	7.0,8.1,9.7	7.6,8.5,10.1	8.1,9.4,10.9	9.0,10.5,12.5	10.1,11.8,13.6	11.3,13.6,16.2	12.6,14.9,16.8	13.9,16.2,19.0	13.7,15.8,19.9
K. Svyatoshinskii R.			7	66	119	172	233	190	195	270	286	97	26
			5.1—8.8	4.8—12.3	3.1—14.0	4.6—15.7	6.2—29.7	6.6—19.6	6.3—24.8	7.2—33.7	8.3—37.1	5.9—36.8	12.0—43.7
			6.5,6.9,8.5	6.9,7.9,8.9	7.4,8.9,10.1	8.2,9.1,10.9	8.9,10.2,11.9	9.8,11.4,13.4	10.7,13.1,15.6	12.7,14.9,17.4	13.2,15.4,17.7	14.7,16.4,19.5	13.9,15.8,20.2
Makarovskii R.	6	21	46	61	49	55	43	35	34	29	19	12	
	2.4—7.6	5.3—8.6	4.8—12.3	5.4—13.4	5.6—13.2	0.4—17.2	4.9—19.8	7.9—15.7	8.9—23.7	10.3—24.0	9.6—23.4	13.1—27.5	
	6.8,6.9,7.2	6.1,6.5,7.2	7.2,7.9,8.9	7.1,8.3,9.4	8.1,9.2,10.1	8.9,9.7,11.0	8.5,10.1,11.8	9.8,11.6,13.9	11.6,13.4,16.4	13.7,15.9,17.5	14.8,17.2,19.4	14.4,17.6,20.2	
Brovarskii R.		1	17	76	88	123	99	101	97	86	74	30	18
		9.0	6.5—13.2	5.1—24.5	5.3—19.1	5.1—40.4	5.3—21.2	6.6—22.2	7.8—24.7	8.1—27.1	8.5—27.9	8.7—24.5	10.6—26.1
			8.5,9.2,9.6	7.9,8.8,10.6	8.7,9.7,11.1	8.9,10.4,11.9	9.2,10.9,12.7	10.4,11.9,13.8	11.1,13.0,14.7	13.0,14.5,17.6	13.8,16.6,19.9	14.9,17.6,19.1	16.0,17.9,20.0
Vasilkovskii R.				36	34	29	35	28	27	27	24	12	13
				4.8—12.4	6.1—16.5	5.7—14.4	7.4—14.4	7.3—16.8	8.1—18.2	9.4—18.9	10.8—22.5	9.0—20.8	13.3—29.2
				6.9,7.5,8.7	7.8,9.0,10.1	7.7,8.8,10.4	8.9,10.1,11.8	10.0,10.8,13.2	10.3,12.1,13.9	11.9,13.1,15.5	13.6,15.6,19.0	14.3,16.9,18.1	17.4,19.1,20.5
Fastovskii R.				13	19	27	27	34	29	30	26	10	3
				5.6—15.7	6.5—18.9	6.3—14.7	6.2—17.7	6.7—21.3	9.5—18.8	12.0—31.8	10.2—26.8	11.6—21.3	17.6—33.3
				6.5,9.0,10.0	7.5,9.0,10.6	9.6,10.3,11.2	9.0,10.1,12.2	9.5,11.7,13.5	12.2,14.4,15.8	14.3,16.5,20.5	13.2,16.9,22.1	13.1,15.3,17.4	17.6,19.4,33.3
Zgurovskii R.									1				
									13.3				
Baryshevskii R.			6	11	21	31	24	26	27	17	10	3	
			4.3—12.6	5.4—12.2	5.7—9.9	5.6—14.3	6.9—13.8	6.0—13.8	8.3—17.3	9.4—19.3	9.8—26.4	13.1—15.6	
			7.9,8.8,9.1	6.4,8.0,10.0	7.3,7.8,8.9	7.7,8.5,10.1	8.1,9.7,11.8	8.7,10.4,11.5	10.5,12.3,14.3	12.5,14.4,16.9	11.8,13.6,19.0	13.1,14.9,15.6	

(cont.)

A30-T07. Continued.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Borispol- skii R.			2 7.4—18.9	14 5.4—13.1 7.7,8.5,11.7	33 5.5—14.9 7.1,8.1,9.7	19 6.1—15.2 8.9,10.0,11.1	24 5.8—16.9 8.2,9.3,10.7	13 6.3—15.5 9.2,11.7,13.1	22 5.6—29.7 10.0,11.8,14.3	21 8.6—23.3 11.6,13.6,14.5	19 10.7—20.1 12.7,14.8,18.1	10 7.9—19.9 14.1,14.7,16.9	1 26.6
Obukhov- skii R.			20 4.8—9.8 6.6,8.0,9.1	39 5.9—13.2 7.3,7.9,9.1	44 5.6—13.3 7.9,9.0,10.3	38 6.8—15.3 8.1,9.3,10.4	41 6.8—15.9 8.7,9.4,10.7	36 7.2—15.0 9.5,10.6,12.9	46 7.6—18.1 11.0,12.0,13.8	32 8.3—24.1 11.5,13.3,15.1	32 10.3—24.5 12.7,14.3,16.6	9 12.4—18.6 15.1,16.7,17.2	6 13.3—21.9 13.6,14.1,20.3
Belotser- kovskii R.			9 5.9—9.3 6.5,7.5,8.5	9 4.4—11.5 6.9,7.9,10.8	22 5.6—11.6 7.9,8.6,9.5	34 6.6—13.8 8.3,9.6,10.6	32 6.4—14.4 8.7,10.0,11.0	30 6.5—15.0 10.0,11.3,12.5	21 8.5—15.4 11.0,12.1,13.0	27 9.0—20.2 10.1,12.2,15.1	20 11.4—24.7 11.9,14.9,17.8	11 12.1—25.1 15.2,18.7,20.6	
Skvirskii R.									2 11.8—13.1		1 15.2		
Yagotinskii R.								1 15.4		1 13.7			1 34.4
P. Khmel- nitskii R.				1 6.8		2 8.3—11.1	1 7.8		1 14.2	1 13.7	2 12.6—20.1		
Kagarlyt- skii R.			5 7.3—9.6 8.3,8.7,9.3	32 5.3—13.0 7.2,8.9,9.8	38 6.3—15.4 8.3,9.6,11.5	43 6.5—13.7 8.8,9.6,10.8	59 6.3—17.5 9.1,10.2,11.5	39 7.0—19.8 9.9,11.1,12.3	23 7.7—19.0 10.9,12.2,14.4	45 5.0—35.3 12.2,13.7,15.5	26 10.8—22.8 13.7,16.6,19.1	24 10.5—23.3 13.5,16.8,19.5	17 12.9—26.7 13.9,16.6,19.9
Rakit- nyanskii R.			17 6.0—11.8 8.0,8.7,9.5	60 5.1—21.0 7.8,8.8,9.9	75 5.5—18.1 8.3,9.3,10.8	64 5.9—17.1 9.4,11.2,12.4	68 7.7—17.7 9.5,11.2,12.9	55 6.4—18.9 9.4,12.0,13.9	55 7.3—23.3 11.7,13.5,16.1	60 9.2—50.4 14.2,17.0,19.6	40 10.8—35.2 13.8,16.6,19.9	14 7.3—22.2 16.1,18.4,20.9	9 16.6—29.2 19.2,20.1,22.1
Volodar- skii R.					60 5.7—16.4 7.8,8.8,9.9	146 4.5—15.2 7.8,9.1,10.4	113 5.4—15.1 8.4,9.7,11.5	126 5.4—24.9 9.6,10.8,12.9	80 7.0—19.8 10.8,12.3,14.3	60 8.5—34.4 12.4,14.0,17.8	26 8.6—23.1 13.6,16.8,18.9	14 12.1—25.3 13.5,17.1,20.8	
Mironov- skii R.					3 7.0—9.5 7.0,8.7,9.5	1 9.2	1 8.9	2 9.0—15.1	1 12.3	1 21.0			
Boguslav- skii R.			1 8.2		15 5.8—11.5 8.0,9.2,9.9	23 5.9—14.0 7.1,9.0,10.6	37 6.4—16.5 8.8,11.0,13.1	27 7.1—19.7 9.9,11.6,14.1	25 6.9—23.7 10.1,13.4,15.4	38 11.0—32.2 13.3,15.6,18.2	35 12.3—35.7 14.6,16.5,19.9	18 12.1—21.6 14.9,17.2,18.3	7 9.6—21.9 13.2,15.3,18.6
Tara- schanskii R.					1 8.1					1 14.8	1 25.2		
Stavi- schenskii R.				22 7.3—14.4 7.8,9.1,10.0	29 5.4—15.0 7.6,9.0,9.8	43 6.5—15.0 8.5,9.3,11.0	22 6.5—14.6 9.5,10.0,10.4	42 8.5—17.2 10.1,11.7,13.2	62 7.9—24.5 10.7,12.5,14.3	58 8.6,21.2 12.0,14.0,16.6	36 8.3—33.4 13.5,15.1,18.2	26 7.9—35.5 14.6,17.1,18.6	1 13.4
Tetievskii R.					44 4.8—20.4 6.7,7.9,9.5	35 6.2—13.4 7.6,9.1,11.3	47 5.9—16.5 8.2,9.3,11.3	43 6.7—21.2 8.7,10.2,13.5	21 6.7—25.1 9.3,11.2,12.4	32 9.7—23.8 11.6,14.5,16.6	20 11.6—27.3 13.5,15.0,17.9	6 10.8—22.0 15.6,17.8,20.4	9 11.7—46.0 12.8,13.8,19.6
Total	23 2.4—11.8 5.9,6.8,7.6	130 2.6—30.5 5.8,6.5,7.5	430 4.1—18.9 6.6,7.7,8.8	980 4.3—24.5 7.2,8.2,9.6	1368 3.1—20.4 7.6,8.9,10.2	1780 0.4—40.4 8.0,9.3,10.9	1787 4.7—29.7 8.6,9.9,11.6	1636 5.4—26.2 9.5,11.0,12.9	1581 5.6—33.3 10.6,12.4,14.7	1683 5.0—50.4 11.9,14.2,16.9	1104 6.8—37.1 13.4,15.7,18.4	551 5.9—36.8 14.3,16.9,19.4	150 9.6—46.0 14.8,17.7,20.3

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not

A30-T08. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Kiev City			17[a]	31	57	71	62	58	53	61	35	24	8
			5.3—14.9[b]	5.3—12.8	4.7—13.6	3.2—22.8	3.1—16.5	5.8—46.3	7.3—22.0	7.7—26.6	7.4—27.0	12.2—21.8	9.3—20.8
			6.7,7.5,8.7[c]	6.8,7.8,8.7	6.8,7.9,9.5	7.0,8.6,10.7	8.4,10.0,11.9	10.2,12.1,16.3	10.8,12.5,16.0	12.8,14.3,16.4	12.2,14.0,18.6	13.9,15.0,16.6	10.6,12.6,17.3
Polesskii	4	19	47	57	41	44	39	24	44	32	11	16	
R.	3.8—7.1	5.1—8.8	4.6—9.9	5.4—20.4	6.1—12.9	6.6—17.3	7.0—22.5	8.3—18.6	8.9—23.9	9.2—26.3	12.9—21.4	11.7—28.9	
	3.8,4.3,5.9	6.0,6.7,7.8	6.6,7.6,8.5	7.3,8.0,9.1	8.4,9.5,10.3	8.6,9.6,11.0	9.1,11.2,13.9	10.8,11.9,14.9	11.6,13.4,15.3	13.8,14.5,16.3	14.4,16.1,20.1	13.3,16.2,18.9	
Ivankov-	4	62	54	63	86	67	57	34	52	73	59	20	2
skii R.	4.3—7.3	3.9—15.2	5.0—13.0	5.3—12.9	4.3—20.5	5.5—17.6	6.0—22.8	7.8—19.2	7.5—29.4	8.0—23.7	4.2—24.2	10.2—26.9	12.9—25.6
	5.2,6.2,6.8	5.8,6.9,7.8	6.4,7.2,8.5	7.3,8.2,9.6	8.0,8.8,10.2	8.0,9.3,11.0	9.7,11.0,12.3	10.4,12.0,13.3	12.3,14.6,17.4	13.2,14.9,16.9	13.4,15.5,17.4	13.9,16.0,17.8	
Boro-	5	13	44	100	139	155	127	124	99	115	66	18	5
dyanskii	4.5—6.8	4.9—11.7	4.7—13.9	4.9—12.7	4.7—18.9	4.2—22.1	4.3—30.5	6.2—29.2	7.3—27.2	7.6—25.1	9.0—33.2	4.5—36.9	13.2—22.3
R.	5.0,5.9,5.9	6.3,6.7,7.4	6.9,7.4,8.5	6.9,7.8,9.1	6.9,7.7,9.2	8.0,9.3,11.1	8.3,10.3,12.3	9.6,11.8,14.2	10.6,13.1,15.9	11.6,13.9,16.4	11.9,14.6,17.3	12.8,14.9,18.4	13.6,17.4,21.4
Vishgor-	1	8	91	126	144	155	127	147	190	154	126	74	32
odskii R.	8.1	4.5—9.8	4.1—14.1	4.8—14.3	5.6—16.8	5.7—22.7	5.9—19.7	7.9—27.3	5.6—30.9	6.3—34.8	10.0—36.3	6.7—25.1	10.6—30.1
		5.4,7.0,8.5	6.1,7.0,8.2	7.2,8.2,9.3	7.6,9.0,10.2	8.2,9.7,11.9	9.4,11.1,13.1	10.9,13.2,15.1	11.7,14.0,16.6	13.2,15.2,18.9	13.5,15.7,19.0	14.0,15.8,18.2	14.3,17.2,19.3
Irpenskii		6	52	131	206	406	450	452	409	388	256	199	29
R.		4.6—10.4	4.1—16.3	3.9—19.7	4.9—20.0	4.7—23.0	5.1—31.5	5.2—31.4	5.9—23.9	6.5—35.1	7.5—29.5	7.3—28.7	7.9—19.9
		5.5,6.5,8.3	5.6,6.2,7.4	6.3,7.6,8.6	6.9,8.2,9.5	7.5,8.8,10.2	8.6,9.9,12.0	9.7,11.7,13.7	10.8,12.7,14.6	11.7,13.8,16.4	11.9,14.3,16.7	12.8,15.2,17.7	12.5,13.7,15.9
K. Svya-			7	65	128	184	207	229	202	254	291	138	52
toshinskii			5.9—9.6	4.6—14.4	4.5—26.2	4.5—19.2	6.0—29.2	6.5—48.0	6.0—41.9	6.6—39.2	8.0—30.3	7.3—26.4	7.9—24.4
R.			6.7,7.6,9.3	7.1,8.1,8.8	7.7,9.1,10.3	8.1,9.5,11.0	9.1,11.0,13.2	10.5,12.4,14.7	12.2,13.8,16.1	12.7,14.6,17.4	12.6,14.8,17.5	12.7,14.7,16.9	12.4,14.5,16.9
Makarov-	5	21	51	62	73	59	61	44	42	45	41	13	3
skii R.	4.9—9.1	6.3—10.7	5.3—12.9	5.8—15.6	6.1—23.2	6.9—33.6	7.0—23.3	9.4—36.4	8.7—25.6	9.4—28.7	8.6—30.6	10.9—27.3	19.4—21.6
	5.2,5.8,7.5	7.2,7.8,8.6	7.0,7.3,8.9	7.3,8.7,9.6	8.0,9.0,11.0	9.3,10.2,11.4	9.3,11.3,12.6	11.2,13.2,16.8	12.3,13.9,16.8	13.1,16.2,18.7	13.3,16.1,20.3	13.1,16.8,20.5	19.4,19.8,21.6
Brovarskii		1	19	86	95	100	103	92	103	102	79	46	23
R.		15.3	6.6—25.1	5.1—16.8	5.4—14.4	5.8—17.2	6.2—33.4	7.0—26.1	7.4—30.4	9.3—29.0	10.3—35.3	10.4—25.1	6.1—28.1
			7.9,9.3,10.1	7.7,9.0,10.1	8.3,9.5,11.0	9.4,10.3,12.2	9.9,11.6,13.2	10.8,13.4,16.0	11.8,14.6,16.8	13.2,15.4,17.9	14.0,16.1,18.7	14.2,16.7,20.5	14.1,17.8,21.4
Vasilkov-				30	35	33	29	35	37	34	26	23	18
skii R.				5.0—12.0	5.9—13.6	6.2—16.3	6.8—14.8	7.7—19.3	6.9—18.5	9.0—21.9	7.9—25.2	9.9—30.1	10.3—22.3
				6.9,8.0,9.0	7.3,8.5,10.1	7.7,9.3,10.6	8.2,10.0,11.0	10.2,12.0,14.1	10.9,12.2,13.8	12.0,14.0,16.3	11.9,14.7,16.3	12.6,14.1,17.0	13.6,15.4,17.9
Fastovskii				14	32	46	50	50	57	68	44	15	14
R.				5.7—12.5	4.4—15.6	6.7—16.5	7.2—22.4	8.0—23.6	8.6—25.6	10.5—31.0	9.5—29.6	10.8—40.4	13.2—37.0
				7.5,8.2,9.9	8.0,9.3,10.5	9.1,10.4,12.1	9.8,11.1,12.7	11.8,13.8,15.3	12.3,14.6,17.2	14.1,16.3,19.1	14.3,17.3,19.7	12.2,15.4,18.6	16.3,22.1,25.8
Zgurovskii						1					1		
R.						9.9					12.7		
Baryshev-				12	9	20	15	32	20	17	3	3	
skii R.				5.3—8.6	5.2—13.2	5.7—12.9	8.1—21.6	7.7—20.3	7.8—31.7	10.5—22.6	9.0—14.1	11.4—14.0	
				5.8,6.7,7.2	6.9,8.2,9.0	8.4,9.8,10.9	10.0,10.5,12.7	9.6,10.9,12.9	10.3,11.9,14.9	11.7,13.7,16.1	9.0,11.2,14.1	11.4,13.5,14.0	
Borispol-				15	29	23	24	14	14	24	13	7	4
skii R.				6.2—11.9	5.8—11.8	7.4—14.4	8.0—19.2	6.4—15.2	9.4—19.2	9.7—27.0	8.0—18.8	13.4—22.1	13.0—20.2
				7.4,8.0,9.0	7.7,9.0,9.9	7.9,9.2,11.3	9.6,11.5,14.0	10.9,12.4,12.7	12.2,13.1,15.8	12.6,14.0,15.8	13.0,15.6,15.8	13.6,15.1,16.9	13.4,16.8,20.0

(cont.)

A30-T08. Continued.

Place of residence	Age (years) at the time of examination: 5	6	7	8	9	10	11	12	13	14	15	16	17
Obu-khovskii R.			13	46	35	38	36	39	25	30	37	26	6
			6.7–11.3	4.9–16.6	4.9–12.2	5.2–26.1	6.8–16.8	7.9–25.7	9.6–18.5	7.9–25.6	11.2–22.9	10.2–31.6	11.8–23.4
			7.8,8.5,9.5	6.7,7.7,9.1	7.3,8.1,9.4	8.1,9.2,11.3	8.9,9.9,11.8	11.1,12.7,14.6	11.1,12.6,15.7	12.3,14.6,17.8	14.4,16.7,19.5	13.2,15.4,16.8	15.4,16.2,17.6
Belotser-kovskii R.			17	28	45	18	25	26	22	24	16	4	
			5.0–10.3	5.0–11.4	6.1–12.8	7.2–15.1	7.0–28.5	4.6–17.5	7.2–23.2	9.1–46.4	10.3–22.1	11.5–20.7	
			6.1,6.8,8.8	6.4,8.0,8.5	7.5,8.7,9.8	8.4,10.2,11.7	9.9,10.7,11.9	10.4,12.4,14.5	12.1,12.7,14.2	12.7,13.8,16.7	12.2,17.0,19.2	13.0,16.7,19.8	
Skvirskii R.				1		2	1		2	1			
				10.8		8.6–10.9	9.6		12.2–13.9	19.0			
Yagotin-skii R.				1	1	3	2		1		1		1
				7.1	9.9	7.0–11.2	14.1–22.3		21.3		14.7		23.7
						7.0,8.2,11.2							
P. Khmel-nitskii R.							1		2	3			
							10.8		10.3–14.7	8.8–26.6			
										8.8,11.6,26.6			
Kagarlyt-skii R.			5	27	39	55	52	53	60	54	39	41	23
			6.7–14.7	5.0–12.9	5.7–13.6	6.5–16.1	5.2–25.0	7.4–21.2	6.5–32.3	8.6–21.1	5.0–43.7	9.8–25.3	11.7–27.3
			6.8,7.2,8.6	7.0,7.9,9.5	7.5,8.8,10.4	8.5,9.5,11.1	9.2,10.9,12.4	10.1,11.9,14.5	11.7,13.7,16.1	12.3,14.2,15.4	13.8,15.0,17.0	13.7,16.4,17.9	13.4,16.4,18.7
Rakit-nyanskii R.			13	65	89	68	73	66	76	60	50	37	14
			5.2–13.3	5.3–19.3	4.9–21.5	6.3–24.3	7.8–23.9	6.1–52.8	6.0–27.2	7.6–24.5	9.4–28.9	10.7–30.9	12.1–23.6
			7.3,8.5,10.0	7.8,8.9,10.2	7.8,9.2,11.0	9.0,10.7,12.3	10.9,12.3,14.8	11.1,12.7,17.1	13.0,14.9,18.1	13.3,15.9,19.6	13.1,16.7,20.6	15.2,18.3,22.2	15.6,17.0,17.6
Volodar-skii R.					66	148	122	125	94	107	53	26	2
					4.2–15.6	5.5–20.2	5.9–20.9	6.1–26.4	8.4–27.3	6.5–29.6	9.2–25.4	9.1–24.9	15.0–15.4
					7.3,8.6,10.3	8.3,9.5,11.0	9.0,10.8,12.8	10.4,11.8,14.6	12.0,13.9,16.8	12.7,15.5,17.8	12.6,14.6,17.9	13.7,16.0,17.1	
Mironov-skii R.			1				4	3	4	1			
			5.6				8.8–32.6	9.4–13.3	10.1–19.0	12.1			
							9.8,11.7,22.6	9.4,12.0,13.3	11.1,13.5,16.9				
Boguslav-skii R.				1	15	13	36	29	25	31	30	17	15
				8.3	6.0–11.8	6.8–19.0	8.1–18.8	7.6–24.5	9.0–23.2	10.6–37.9	10.0–28.1	12.0–22.9	10.9–21.7
					7.2,8.8,10.2	8.3,10.3,12.0	10.9,12.9,14.5	12.2,13.4,15.0	14.1,15.7,17.9	11.9,14.8,16.0	12.9,15.9,19.3	13.4,17.1,20.1	12.6,15.4,19.4
Tara-schanskii R.					1		1		2	2			
					9.8		11.0		15.1–56.5	6.6–22.4			
Stavi-schenskii R.				27	41	41	32	32	54	66	56	51	5
				5.5–24.0	4.3–12.8	5.1–17.5	6.3–16.9	6.9–20.1	7.4–20.8	9.9–29.5	10.3–25.0	10.0–28.4	11.6–14.5
				7.2,8.0,9.7	6.9,8.2,9.7	8.6,10.3,11.4	9.4,10.6,13.2	10.9,12.6,14.6	11.0,13.7,15.9	13.0,14.5,16.4	13.4,15.1,17.5	15.1,16.6,19.7	11.7,12.7,13.9
Tetievskii R.					38	35	45	49	31	44	43	24	17
					4.3–14.7	1.0–13.9	6.7–16.9	7.0–20.5	7.4–18.8	7.9–23.4	9.5–29.3	9.2–30.9	10.8–33.0
					7.0,7.9,9.4	7.2,7.8,9.3	8.8,10.1,11.1	10.0,11.5,13.6	10.6,11.9,14.6	11.9,13.7,15.5	12.8,14.5,18.9	11.5,14.5,17.9	13.4,14.8,19.4
Total	19	130	431	990	1455	1797	1790	1760	1724	1797	1379	822	273
	3.8–9.1	3.9–15.3	4.1–25.1	3.9–24.0	4.2–26.2	1.0–33.6	3.1–33.4	4.6–52.8	5.6–56.5	5.0–46.4	4.2–43.7	4.5–40.4	6.1–37.0
	4.8,5.9,7.1	6.1,7.0,8.0	6.4,7.3,8.7	7.0,8.1,9.3	7.4,8.7,10.1	8.0,9.4,11.1	9.0,10.7,12.7	10.3,12.2,14.5	11.5,13.5,16.1	12.5,14.6,17.2	12.9,15.0,18.0	13.3,15.4,18.1	13.2,15.7,18.9

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not

A30-109. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination: Zhitomir region, Ukraine: Boys

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Korosten City	12[a]	45	154	345	449	454	419	378	461	475	287	221	38
	2.2—6.9[b]	2.4—8.6	2.5—12.3	2.6—18.3	2.7—21.4	1.8—16.2	3.2—23.8	3.4—25.3	3.9—35.5	1.6—31.2	5.3—36.1	6.8—38.7	10.7—30.5
	3.1,4.0,4.8[c]	3.3,4.1,4.9	4.6,5.4,6.7	5.3,6.3,7.6	5.9,7.1,8.5	6.3,7.5,9.0	6.8,8.4,10.3	7.7,9.5,12.0	9.1,11.1,13.4	10.5,13.4,16.2	11.5,14.5,17.5	12.7,15.3,18.8	13.2,15.1,17.1
Ovruchskii R.		15	19	41	70	153	165	155	166	177	145	97	33
		4.9—8.4	4.2—8.6	2.5—10.9	3.1—13.9	3.0—19.9	4.4—20.0	5.6—22.8	5.1—27.4	4.5—26.9	8.4—29.9	7.5—35.0	11.4—29.5
		5.7,6.1,6.9	5.6,6.4,7.0	4.8,6.1,7.5	5.9,7.2,9.2	6.8,8.1,10.0	7.4,8.9,11.6	8.2,9.8,12.1	9.6,11.2,15.1	10.4,12.0,15.9	11.3,13.8,17.6	12.5,14.9,18.4	13.6,15.1,18.7
Olevskii R.		4	21	69	131	144	123	123	128	145	100	71	35
		4.6—8.1	3.3—13.8	3.0—13.8	3.2—20.5	3.3—26.4	2.9—19.2	4.8—19.4	4.4—33.3	5.3—35.5	6.6—37.4	7.1—35.3	11.7—34.7
		5.1,6.6,7.8	5.9,6.6,8.9	5.9,7.2,8.4	6.5,8.3,10.2	7.3,8.9,10.8	7.9,9.7,11.6	9.1,11.6,14.0	10.2,12.8,16.2	12.5,15.2,18.2	14.3,17.2,20.8	14.4,18.6,23.6	15.3,18.4,23.2
Narodichskii R.	1	10	12	30	25	47	49	42	41	30	33	22	
	5.9	2.7—8.8	2.9—9.3	3.1—11.8	4.3—9.5	3.8—11.5	4.5—18.5	5.3—40.1	5.5—18.2	5.4—24.2	6.7—23.4	7.8—21.9	
		4.7,5.2,7.1	4.9,5.6,7.3	5.1,5.9,6.7	5.4,6.2,6.9	6.0,7.2,8.6	6.9,8.2,9.9	7.5,8.9,11.7	9.4,11.6,13.3	10.4,12.4,15.3	9.4,12.5,17.3	10.7,12.3,14.2	
Korostenskii R.	1	21	88	142	233	258	225	246	230	273	186	143	33
	16.8	2.9—8.1	2.7—12.6	2.9—12.7	3.3—17.9	3.0—17.2	4.2—18.7	4.5—28.0	5.3—31.5	3.7—29.7	4.6—34.0	4.7—32.9	9.5—29.9
		4.2,4.7,5.6	4.7,5.9,7.6	5.2,6.4,7.8	5.8,7.3,8.9	6.6,8.1,9.8	7.2,9.1,10.7	7.6,9.7,11.7	9.1,10.8,13.6	10.6,13.1,15.9	11.9,14.4,18.2	12.2,15.5,19.8	14.6,17.4,19.5
Luginskii R.	5	8	27	76	103	92	82	89	83	64	66	40	1
	4.4—7.0	3.5—11.5	3.6—10.2	2.9—13.2	3.3—35.0	3.6—18.4	4.9—19.7	3.5—23.5	5.1—30.0	4.6—30.1	8.2—27.8	8.7—54.1	10.2
	5.6,5.7,6.3	4.8,6.0,7.2	5.2,5.9,7.8	5.4,6.7,8.3	5.9,7.3,8.6	7.0,8.5,10.2	8.0,9.9,12.4	9.2,12.1,13.9	10.7,12.6,16.0	11.5,13.0,15.6	11.4,14.3,16.3	13.4,16.7,19.7	
Emilchinskii R.	2	13	30	58	92	169	130	141	112	98	104	57	8
	4.2—5.0	4.0—8.0	3.3—10.9	3.2—12.9	3.2—12.9	3.9—20.0	3.8—25.3	3.1—21.5	5.2—21.6	6.4—39.9	6.6—26.7	9.4—34.9	11.6—30.1
		5.2,6.3,7.2	5.0,6.4,8.3	5.4,6.5,8.3	6.3,7.5,9.1	6.4,7.6,10.2	7.0,8.1,11.2	7.8,9.1,12.0	9.3,10.4,13.4	10.2,11.7,16.4	11.4,14.4,19.1	12.4,14.7,20.2	11.9,12.9,16.9
Malinskii R.	7	24	46	63	71	138	151	144	161	156	101	57	16
	3.0—5.4	2.5—7.8	3.2—13.1	3.1—14.3	3.8—11.9	3.8—14.3	3.7—19.4	4.3—17.8	3.4—30.3	6.2—26.8	2.0—35.6	9.2—33.5	11.3—26.7
	3.4,4.0,4.9	3.6,4.5,5.6	4.1,5.0,5.9	4.1,5.2,6.9	4.9,6.3,8.1	6.4,7.0,8.8	7.1,8.2,10.5	7.6,9.5,11.8	8.8,10.3,13.2	10.2,11.7,15.7	10.6,11.5,15.8	11.4,13.8,17.1	11.4,11.7,17.6
V. Volinskii R.	2	12	55	151	188	220	192	208	165	131	132	151	1
	3.7—9.5	2.6—7.0	3.0—12.2	2.5—14.1	2.7—16.0	1.8—17.5	2.9—17.9	2.9—21.4	3.8—52.2	3.9—40.8	4.6—33.3	5.4—48.6	12.0
		4.0,4.9,6.3	4.3,5.2,6.4	4.6,6.0,7.8	4.9,7.0,9.4	6.6,8.0,10.0	7.0,9.0,11.2	7.8,9.8,12.2	8.9,11.1,13.6	10.0,12.4,15.6	11.8,14.5,17.4	13.4,15.3,18.9	
N. Volinskii R.	2	11	19	36	92	90	83	76	76	44	14	7	
	2.4—3.5	2.8—20.4	2.4—9.5	2.9—8.2	2.4—14.4	3.7—16.4	4.3—15.0	1.4—16.8	4.4—22.3	6.4—24.7	5.3—22.8	8.1—26.8	
		4.1,4.8,5.4	4.7,5.5,6.5	4.6,5.8,6.9	5.9,7.2,8.6	6.6,7.9,9.2	6.8,7.8,10.4	7.8,8.9,10.6	8.6,10.5,13.0	11.1,13.5,16.5	11.2,13.9,18.7	9.1,14.2,22.6	
Radomishliskii R.	5	7	1										
	2.2—5.2	2.2—3.9	5.6										
	2.3,2.7,3.4	2.6,3.5,3.6											
Brusilovskii R.	2	5	13	12	14	13	15	23	13	12	6	1	
	6.6—9.1	5.0—8.2	4.5—8.3	4.2—10.9	4.4—9.3	4.0—12.8	6.2—10.6	6.6—19.5	8.2—14.4	8.5—23.0	7.2—16.5	15.3	
		5.5,5.7,5.8	5.0,5.5,6.4	5.2,6.3,7.8	6.6,7.6,8.3	6.6,7.8,8.6	6.6,8.4,9.3	8.6,10.7,13.4	9.9,12.5,12.9	9.9,10.6,12.3	12.5,14.5,15.2		
Total	39	175	487	1026	1478	1791	1640	1637	1641	1610	1176	867	165
	2.2—16.8	2.2—20.4	2.4—13.8	2.5—18.3	2.4—35.0	1.8—26.4	2.9—25.3	1.4—40.1	3.4—52.2	1.6—40.8	2.0—37.4	4.7—54.1	9.5—34.7
	3.4,4.4,5.7	4.0,4.9,6.1	4.7,5.6,7.0	5.1,6.3,7.8	5.8,7.2,8.9	6.5,7.9,9.7	7.0,8.7,10.8	7.9,9.7,12.2	9.3,11.1,13.9	10.5,12.9,16.2	11.4,14.4,17.9	12.5,15.3,19.3	13.4,15.8,20.1

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A30-T10. Distribution of thyroid volume (cm^3) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls.

Place of residence	Age (years) at the time of examination 5	6	7	8	9	10	11	12	13	14	15	16	17
Korosten	16[a]	41	170	350	492	440	434	429	495	546	333	252	63
City	2.8—9.0[b]	2.2—8.3	2.1—11.2	3.1—16.7	1.5—17.1	3.1—20.5	3.4—25.4	3.4—34.3	3.1—38.7	5.0—35.2	4.8—33.9	7.1—49.0	8.5—42.7
	3.2,3.8,4.6[c]	3.2,4.3,5.3	4.6,5.5,6.8	5.2,6.4,8.0	5.9,7.1,8.7	6.3,7.8,9.2	7.2,9.1,11.5	8.7,10.9,13.3	10.3,12.3,15.5	10.9,13.7,16.9	11.6,13.9,16.9	12.0,14.5,17.5	12.7,14.6,18.1
Ovruch-	6	14	23	51	92	152	189	204	231	202	156	145	28
skii R.	3.7—7.4	3.6—9.8	3.7—10.1	3.6—12.4	2.0—23.1	3.2—17.0	4.5—22.6	4.3—22.1	5.8—35.3	5.5—36.2	6.0—43.4	9.0—29.9	12.1—28.4
	5.6,6.1,6.4	4.9,6.3,7.8	5.4,6.3,7.3	5.1,6.4,8.7	6.1,7.8,9.7	7.0,8.9,11.4	7.7,10.2,13.2	8.7,10.5,14.8	10.2,13.0,17.2	11.0,13.5,17.7	12.0,15.4,19.7	12.6,15.1,19.0	13.1,14.8,19.7
Olevskii		3	14	71	152	157	148	148	137	159	133	127	77
R.		3.7—14.8	4.6—8.0	3.4—19.1	3.4—19.1	4.0—23.5	4.3—22.7	5.4—31.2	5.9—40.4	2.7—41.3	4.6—36.8	5.2—48.6	9.6—40.6
		3.7,4.1,14.8	5.1,6.5,7.6	6.0,7.4,8.9	7.0,8.3,10.4	7.4,8.9,11.0	8.6,10.2,12.6	10.2,12.3,15.7	11.8,14.3,17.3	11.7,15.0,18.6	13.2,16.3,20.4	13.3,16.3,19.3	14.4,17.1,19.1
Naro-	5	3	22	34	31	60	59	42	62	55	41	23	
dichskii R.	3.6—5.8	3.6—7.8	3.7—7.3	3.1—13.9	3.2—12.4	3.1—16.5	4.0—18.2	2.1—27.1	5.4—27.2	7.3—27.5	7.4—20.5	8.1—25.3	
	3.9,4.3,4.9	3.6,5.2,7.8	4.4,4.7,5.9	5.7,6.4,8.2	5.4,6.9,7.8	6.2,7.8,9.8	6.7,8.6,10.8	8.6,9.4,11.9	8.5,11.3,14.5	10.6,12.8,16.0	10.9,12.8,14.7	11.9,13.9,16.2	
Koros-	2	35	99	156	252	269	268	209	253	243	181	154	35
tenskii R.	5.8—7.3	3.1—10.0	2.9—12.9	2.6—13.4	3.3—17.8	3.6—27.2	3.2—30.0	3.4—31.2	5.1—40.7	6.8—40.1	5.3—40.0	5.4—41.1	6.0—28.1
		4.5,5.5,6.4	4.7,5.7,7.1	5.5,6.6,8.0	5.9,7.1,8.5	6.8,8.5,10.2	7.4,9.2,11.7	9.0,11.1,13.8	9.8,12.7,16.3	11.8,14.8,17.9	11.9,14.5,18.1	11.8,14.0,17.3	13.8,16.1,19.5
Luginskii	2	5	21	90	96	99	91	92	73	79	78	60	1
R.	5.7—10.0	3.2—7.7	3.0—10.1	2.9—12.7	4.1—17.2	4.7—33.5	2.6—26.0	5.5—26.1	7.3—28.1	7.0—32.8	7.1—33.2	6.5—26.1	28.6
		4.2,4.9,6.0	4.8,5.7,6.8	5.7,6.7,8.0	6.0,7.9,9.2	7.5,8.5,10.9	7.5,9.4,13.3	9.3,12.0,15.1	10.9,13.6,17.1	11.8,13.9,17.3	11.9,13.7,17.1	13.1,15.5,18.0	
Emil-	5	9	31	56	100	202	147	138	155	135	120	64	14
chinskii	4.2—11.1	3.1—6.9	3.3—13.3	3.7—10.7	3.7—18.3	3.7—20.0	4.8—25.2	4.7—35.3	5.1—62.5	7.5—43.3	4.9—40.6	8.1—36.1	5.4—30.6
R.	4.3,5.0,6.3	4.6,5.5,6.1	5.1,5.6,6.8	4.9,6.1,7.5	6.4,7.7,9.0	6.3,7.8,10.0	7.9,9.8,12.6	8.7,10.6,14.2	9.4,11.9,16.3	10.8,13.4,17.7	12.1,15.7,19.2	12.1,13.1,16.7	11.6,15.0,21.4
Malinskii	5	23	38	60	75	184	175	170	152	151	96	65	13
R.	3.1—9.1	2.3—7.6	1.9—9.3	3.2—8.4	3.4—14.4	4.2—23.6	3.1—19.5	4.5—27.3	6.0—41.8	5.8—27.0	3.0—34.5	7.5—25.8	10.6—31.8
	3.1,3.2,5.4	4.1,5.6,6.2	4.1,4.9,6.4	4.5,5.7,6.7	5.5,7.0,8.2	6.6,7.9,10.1	7.5,9.4,11.8	8.4,10.8,13.9	9.3,12.3,16.2	10.3,13.0,17.4	11.0,13.3,18.3	11.4,14.7,18.8	12.4,15.9,21.1
V. Volin-	1	9	31	128	188	183	205	206	184	182	207	194	2
skii R.	14.5	3.4—16.0	3.0—11.8	2.8—12.9	2.9—22.1	3.2—27.8	3.2—22.7	4.5—33.5	4.0—29.9	2.7—54.6	7.1—41.1	6.5—47.1	14.6—21.1
		4.5,5.0,6.7	4.6,5.7,7.0	4.7,6.0,7.8	5.4,7.1,9.2	7.0,8.9,11.2	8.1,10.1,12.5	9.1,11.0,13.6	10.0,12.7,15.9	11.3,14.2,18.2	12.8,15.1,19.1	12.5,15.3,18.9	
N. Volin-	2	5	21	45	99	125	140	114	111	79	35	10	1
skii R.	3.4—4.6	2.7—6.8	3.2—10.8	3.1—10.9	3.0—18.4	3.2—17.3	3.6—25.2	4.3—29.3	4.9—30.9	6.0—44.1	8.4—25.8	12.3—20.7	20.2
		3.2,3.5,4.6	4.9,5.2,6.0	5.2,6.4,7.8	6.0,7.1,9.6	6.8,8.3,10.6	7.7,9.4,12.1	8.8,10.6,14.7	9.6,11.9,15.6	10.7,12.5,15.0	12.3,15.0,19.4	13.5,15.7,18.5	
Rado-	2	14	1	1									
mishliskii	2.8—3.1	2.9—4.7	6.6	4.4									
R.		3.1,3.6,3.7											
Brusilov-	2	11	14	11	10	13	12	15	11	18	3	3	1
skii R.	3.4—3.6	3.3—7.8	3.6—7.9	4.2—7.8	4.6—11.1	5.9—14.1	5.0—17.7	6.0—19.7	7.5—24.8	8.6—30.0	10.7—24.9	11.2—15.7	14.7
		3.7,4.8,5.8	4.6,5.5,6.0	5.6,7.1,7.6	6.2,7.3,7.4	7.1,9.4,10.5	8.3,11.3,12.1	8.0,9.8,11.9	11.1,12.6,17.1	11.7,13.9,18.9	10.7,16.8,24.9	11.2,14.8,15.7	
Total	49	172	487	1054	1595	1893	1878	1773	1872	1855	1385	1097	235
	2.8—14.5	2.2—16.0	1.9—13.3	2.6—19.1	1.5—23.1	3.1—33.5	2.6—30.0	2.1—35.3	3.1—62.5	2.7—54.6	3.0—43.4	5.2—49.0	5.4—42.7
	3.4,4.5,5.8	3.7,4.8,6.0	4.6,5.5,6.8	5.2,6.4,7.9	6.0,7.3,9.0	6.7,8.2,10.2	7.7,9.5,12.1	8.9,11.1,14.0	10.1,12.6,16.1	11.0,13.8,17.5	12.0,14.8,18.5	12.3,14.8,18.2	13.2,15.8,19.5

[a]Number of subjects; [b]Range of thyroid volumes. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of thyroid volumes. Data are not given if the number of subjects was less than three.

A31-T01. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Gomel region, Belarus. Boys.

Place of residence	Age (years) at the time of examination										
	6	7	8	9	10	11	12	13	14	15	16	17
Gomel City	1 9.9	4[a] 0.9—100.6[b] 3.0,6.9,54.6[c]	6 2.1—88.6 7.6,17.5,22.0	4 6.9—25.9 7.4,10.3,19.3	3 11.2—100.6 11.2,85.2,100.6	6 2.9—29.4 3.1,6.8,18.0	3 4.5—18.5 4.5,11.3,18.5	3 15.0—26.2 15.0,22.3,26.2	1 4.0	1 21.0		
Mozir City												
Dobrushskii R.												
Vetkovskii R.												
Gomelskii R.	4 9.0—33.5 9.6,10.7,22.3	3 9.1—20.8 9.1,10.6,20.8	4 4.7—55.7 7.1,11.9,34.9	2 5.5—20.1	2 3.2—21.8	5 10.3—28.4 11.0,18.8,20.8	2 9.6—16.9		1 59.9	1 19.9		
Loevskii R.									1 12.7			
Braginskii R.												
Checherskii R.										1 9.2		
Buda-Koshelevskii R.			2 7.6—17.3						1 11.0			
Rechitskii R.							1 10.2					
Hoynikskii R.												
Narovlyanskii R.												
Kormyanskii R.		2 20.2—23.6	2 21.8—39.3	4 14.7—59.9 20.8,32.9,49.4				1 68.0				
Rogachevskii R.			1 16.2									
Zlobinskii R.												
Svetlogorskii R.			1 19.1									

(cont.)

A31-T01. Continued.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Kalinkovichskii R.												
Mozirskii R.												
Elskii R.		2	3	1				2	3	5	1	
		15.7—31.7	18.3—34.7	13.3				21.3—23.1	18.1—24.3	16.7—26.8	16.8	
			18.3,26.8,34.7						18.1,21.9,24.3	19.5,21.2,22.4		
Oktyabrskii R.												
Petrikovskii R.												
Lelchitskii R.												
Zitkovichskii R.												
Total	5	11	19	11	5	11	6	6	7	8	1	
	9.0—33.5	0.9—100.6	2.1—88.6	5.5—59.9	3.2—100.6	2.9—29.4	4.5—18.5	15.0—68.0	4.0—59.9	9.2—26.8	16.8	
	9.9,10.2,11.2	8.7,15.7,23.6	9.6,18.3,26.8	8.0,14.7,26.9	11.2,21.8,85.2	3.2,11.0,20.8	9.6,10.7,16.9	21.3,22.7,26.2	11.0,18.1,24.3	18.1,20.4,21.8		

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than one.

A31-T02. Distribution of urinary iodine excretion levels (µg/dl) by place of residence and age at the time of examination. Gomel region, Belarus. Girls.

Place of residence	Age (years) at the time of examination										
	6	7	8	9	10	11	12	13	14	15	16 17
Gomel City	2 9.3—14.6	5[a] 7.5—42.8[b] 9.5,14.7,17.5[c]	7 4.0—34.4 5.5,22.5,32.8	9 4.7—100.7 10.0,19.1,20.6	7 7.0—49.8 8.7,14.7,28.7	5 16.0—64.1 19.4,27.3,41.5	4 3.4—11.3 3.8,5.7,9.2	8 3.8—64.3 6.2,10.9,30.8	6 2.7—100.6 29.0,39.9,47.7		
Mozir City			1 8.9	1 14.8	1 10.9				1 25.4		
Dobrushskii R.			1 10.5					1 6.1			
Vetkovskii R.											
Gomelskii R.				2 6.3—12.5	2 18.9—28.5	4 6.8—35.9 9.0,11.5,23.8	4 5.6—27.3 9.3,16.2,23.4	1 12.2		2 12.2—16.6	
Loevskii R.						1 13.4					
Braginskii R.				1 23.4							
Checherskii R.											
Buda-Koshelevskii R.				1 6.5			1 1.9	1 0.7			
Rechitskii R.			1 13.8								
Hoynikskii R.						1 19.2				1 2.3	
Narovlyanskii R.											
Kormyanskii R.	2 14.4—20.9		3 29.4—39.6 29.4,32.5,39.6	3 18.4—29.4 18.4,23.9,29.4	1 20.7	1 48.2	1 6.7		1 18.0		
Rogachevskii R.					1 20.3						
Zlobinskii R.					1 13.6			1 6.2			
Svetlogorskii R.				1 7.7							

(cont.)

A31-T02. Continued.

Place of residence	Age (years) at the time of examination										
	6	7	8	9	10	11	12	13	14	15	16 17
Kalinkovichskii R.						1	1				
						36.1	41.6				
Mozirskii R.											
Elskii R.	3	3		3	1		1	1	4	5	
	10.9—22.7	17.1—21.6		12.6—18.3	8.1		36.4	10.8	15.2—22.9	14.4—38.3	
	10.9,13.8,22.7	17.1,18.9,21.6		12.6,14.4,18.3					15.5,16.8,20.3	14.7,19.9,28.3	
Oktyabrskii R.											
Petrikovskii R.			1								
			5.7								
Lelchitskii R.				1			1				
				24.4			14.9				
Zitkovichskii R.											
Total	7	8	14	22	14	13	13	13	12	8	
	9.3—22.7	7.5—42.8	4.0—39.6	4.7—100.7	7.0—49.8	6.8—64.1	1.9—41.6	0.7—64.3	2.7—100.6	2.3—38.3	
	10.9,14.4,20.9	12.1,17.3,20.2	8.9,18.1,32.5	10.0,18.0,21.7	10.9,16.8,20.7	13.4,19.4,36.1	5.6,11.3,19.5	6.1,8.1,13.7	16.8,24.1,39.9	13.3,15.6,24.1	

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-103. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys.

Place of residence	Age (years) at the time of examination 6	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	17[a] 6.4–87.4[b] 19.6,26.5,43.1[c]	109 1.4–110.5 7.5,12.5,31.7	109 0.8–156.2 9.3,17.4,35.0	144 1.1–156.5 11.9,23.5,44.5	123 2.0–124.9 10.3,21.0,34.4	153 0.5–111.3 8.2,13.8,31.2	78 0.2–77.6 8.1,16.0,33.8	61 1.6–132.0 7.6,20.3,41.6	63 2.5–107.7 7.2,11.7,25.7	37 1.7–94.6 7.1,11.4,20.5	25 2.3–84.2 7.2,11.2,24.7	9 5.8–18.9 10.0,10.9,11.0
Bobruisk City												
Hotimskii R.												
Klimovichskii R.						2 6.1–6.6	4 3.3–9.1 3.3,5.5,8.3	1 80.4				
Kostyukovichskii R.												
Mstislavskii R.												
Krichevskii R.												
Cherikovskii R.	1 9.2		6 3.3–16.4 3.4,4.1,15.4	8 4.1–57.0 5.4,6.2,15.0	5 7.7–13.4 8.3,9.0,12.3	15 5.6–34.9 6.2,11.8,21.4	4 4.8–15.7 5.9,7.2,11.5	10 4.5–16.1 5.4,11.7,14.6	3 5.6–8.8 5.6,6.7,8.8	2 5.3–8.0	2 10.7–25.0	2 10.2–16.2
Krasnopolskii R.	2 13.2–42.2			1 16.2	2 5.0–6.8	1 2.5	3 2.2–9.2 2.2,7.4,9.2					
Goretskii R.												
Chausskii R.	5 10.4–30.3 13.4,14.6,23.9	6 3.0–37.1 5.2,9.6,10.6	4 11.5–43.3 17.0,24.5,34.9	5 3.6–20.3 5.4,9.8,13.8	5 15.4–20.5 18.5,19.9,20.4	2 10.9–11.8		1 8.3	2 17.0–28.9	6 2.5–31.8 11.5,22.4,27.7		
Slavgorodskii R.												
Shklovskii R.												
Mogilevskii R.	12 6.7–112.5 15.3,27.3,36.4	39 3.9–114.5 13.2,20.7,28.9	28 5.2–86.4 16.1,26.3,37.4	30 4.0–55.7 13.5,19.0,27.2	35 7.2–62.5 16.6,23.4,34.5	23 7.1–60.4 17.5,25.2,34.0	26 3.0–64.4 13.2,21.3,25.6	21 10.1–41.1 17.0,24.7,31.2	21 7.9–116.2 19.0,23.1,29.4	6 12.4–55.7 18.7,33.1,39.2	3 25.0–40.6 25.0,38.4,40.6	
Bykhovskii R.							1 7.3	1 8.3	1 9.1			
Kruglianskii R.												
Belynichskii R.												
Klichevskii R.				1 16.9			1 33.6	1 21.8				
Kirovskii R.					1 7.2							
Bobruiskii R.												
Osipovichskii R.												
Glusskii R.												
Total	37 6.4–112.5 14.6,24.4,37.5	154 1.4–114.5 8.0,16.4,29.0	147 0.8–156.2 9.7,19.8,35.0	189 1.1–156.5 11.5,19.9,36.9	171 2.0–124.9 10.6,20.4,33.2	196 0.5–111.3 8.2,14.9,30.5	117 0.2–77.6 8.1,15.8,31.8	96 1.6–132.0 9.9,17.9,36.2	90 2.5–116.2 8.8,14.7,27.5	51 1.7–94.6 7.2,11.8,24.9	30 2.3–84.2 7.8,14.1,34.8	11 5.8–18.9 10.0,10.9,11.2

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-T04. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	13[a] 7.3–90.5[b] 22.3,26.1,35.1[c]	91 0.7–172.6 7.6,15.8,28.3	111 0.6–96.7 10.0,17.2,28.3	130 1.0–100.8 11.5,24.3,49.9	156 0.4–160.7 9.8,17.9,32.4	152 1.2–162.0 7.7,11.8,27.6	65 2.9–145.9 9.5,19.8,46.1	55 3.5–83.5 8.9,21.6,44.2	43 1.2–97.6 7.5,17.2,29.9	49 1.8–107.5 8.0,15.0,36.6	39 1.5–68.8 6.8,10.3,22.6	10 5.7–80.1 8.4,10.0,15.4
Bobruisk City												
Hotimskii R.												
Klimovichskii R.				2 11.9–22.9	1 4.9	2 6.4–7.0	5 0.1–80.4 5.3,40.4,64.4	3 11.2–64.4 11.2,51.3,64.4	5 3.4–30.9 7.9,10.3,17.8			
Kostyuko-vichskii R.					1 5.3							
Mstislavskii R.												
Krichevskii R.												
Cherikovskii R.		1 17.2	4 1.3–11.2 1.9,3.6,7.9	5 1.1–8.1 3.2,3.5,5.2	3 6.8–20.1 6.8,8.7,20.1	13 0.4–56.4 9.6,11.8,17.2	14 0.4–45.1 4.6,14.2,20.5	7 6.0–38.3 15.3,18.0,35.7	5 11.5–72.3 14.9,19.0,35.6	11 4.8–27.4 7.1,9.8,13.8	3 6.0–21.8 6.0,15.2,21.8	2 17.1–19.0
Krasnopolskii R.	2 11.7–19.3	1 3.7		1 10.0	2 5.2–5.8	4 1.8–12.9 3.5,5.4,9.3	8 3.1–26.0 4.0,8.2,19.6					
Goretskii R.												
Chausskii R.	8 4.9–51.5 10.0,11.3,21.8	7 3.1–35.5 3.9,21.0,23.7	3 6.1–24.2 6.1,14.4,24.2	3 12.8–30.7 12.8,13.8,30.7		9 7.5–52.0 17.6,21.3,29.4	10 4.7–29.7 7.3,13.2,16.0	6 5.7–40.2 9.2,11.8,19.4	7 2.3–29.4 7.9,13.0,27.6	3 6.2–135.5 6.2,9.6,135.5		
Slavgorodskii R.												
Shklovskii R.												
Mogilevskii R.	10 3.9–135.2 11.8,29.7,46.4	24 6.7–54.9 13.1,26.4,35.8	28 5.7–59.2 15.5,22.6,32.1	27 4.0–58.3 9.3,16.7,29.0	33 3.0–70.4 12.0,22.0,30.4	24 11.3–46.9 19.3,24.8,30.2	23 2.7–56.4 17.8,24.8,38.6	19 15.3–57.9 27.0,32.3,36.9	15 2.7–41.5 19.7,26.6,31.3	12 8.0–41.2 11.4,19.9,22.2	8 7.7–37.1 18.4,21.8,32.7	
Bykhovskii R.				1 11.3	2 10.4–24.3	3 2.5–9.2 2.5,7.5,9.2	4 0.5–27.1 1.4,3.4,15.8	2 5.4–9.9	1 8.4		1 34.9	
Kruglianskii R.												
Belynichskii R.												
Klichevskii R.					1 15.2							
Kirovskii R.												
Bobruiskii R.												
Osipovichskii R.												
Glusskii R.												
Total	33 3.9–135.2 10.9,22.8,35.1	124 0.7–172.6 9.2,17.5,31.7	146 0.6–96.7 10.1,18.1,28.5	169 1.0–100.8 10.9,21.0,40.5	199 0.4–160.7 9.5,18.1,31.0	207 1.2–162.0 8.5,13.0,27.5	129 0.1–145.9 8.7,17.5,35.4	92 3.5–83.5 10.0,24.9,37.7	76 1.2–97.6 9.6,18.9,29.7	75 1.8–135.5 8.0,13.5,29.7	51 1.5–68.8 7.6,11.5,24.7	12 5.7–80.1 8.9,10.7,18.0

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data ...

A31-T05. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Klincy City	1	8[a]	20	21	32	21	32	27	15			
	3.5	1.8—18.6[b]	1.8—80.4	1.1—60.9	1.5—72.7	2.6—28.8	1.8—15.6	2.4—46.6	3.1—21.3			
		3.1,4.5,7.1[c]	4.9,5.6,11.0	4.5,8.2,13.4	4.9,7.5,10.7	5.2,6.1,7.6	4.5,7.1,10.5	4.0,8.2,16.2	4.6,6.7,10.5			
Gordeevskii R.												
Klintsovskii R.	2	5	3	5	3		4	4	3	3		
	6.4—7.4	9.9—232.4	2.5—7.9	2.3—9.9	2.8—7.1		3.0—10.6	2.5—10.6	6.7—15.7	5.8—16.3		
		11.8,14.4,42.2	2.5,6.7,7.9	5.1,6.0,6.7	2.8,4.4,7.1		3.1,5.8,9.5	3.7,5.4,8.2	6.7,9.1,15.7	5.8,6.1,16.3		
Novozybkov-skii R.												
Zlynkovskii R.			1	3	1	1	4	3	3		1	
			10.3	10.2—20.5	8.9	7.5	5.2—27.9	3.2—77.9	8.0—12.6		9.1	
				10.2,11.5,20.5			5.3,8.9,20.2	3.2,9.3,77.9	8.0,10.6,12.6			
Krasnogorskii R.												
Total	3	13	24	29	36	22	40	34	21	3	1	
	3.5—7.4	1.8—232.4	1.8—80.4	1.1—60.9	1.5—72.7	2.6—28.8	1.8—27.9	2.4—77.9	3.1—21.3	5.8—16.3	9.1	
	3.5,6.4,7.4	4.5,8.3,14.4	4.9,5.8,10.5	5.1,8.2,11.7	4.7,7.1,10.4	5.2,6.2,7.6	4.5,7.1,10.6	4.0,7.8,11.1	5.5,8.6,10.6	5.8,6.1,16.3		

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-T06. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls.

Place of residence	Age (years) at the time of examination										
	6	7	8	9	10	11	12	13	14	15	16	17
Klincy City	1 3.0	14[a] 3.4–75.4[b] 6.2,9.6,29.7[c]	15 2.5–38.8 3.8,6.0,12.0	18 1.0–35.6 1.9,5.6,8.1	19 1.5–19.7 2.6,4.7,8.5	34 0.1–63.1 3.4,6.5,10.2	24 1.8-80.4 5.0,9.3,15.4	31 3.0-27.1 5.5,7.8,11.4	39 1.3-75.9 4.3,7.1,13.0	21 2.0-85.4 6.0,10.1,13.7	2 12.4-30.1	
Gordeevskii R.								1 7.0				
Klintsovskii R.	6 3.0–12.2 4.7,7.9,11.5	2 2.6–4.7	5 2.4–3.7 2.6,3.4,3.4	2 7.2–7.5	3 1.9–10.0 1.9,6.5,10.0	3 3.1–7.9 3.1,6.7,7.9	2 0.8-4.3	3 3.5-7.3 3.5,4.3,7.3	2 2.1-10.8	2 7.6-15.9		
Novozybkovskii R.												
Zlynkovskii R.			2 3.3–4.9	3 3.5–10.6 3.5,7.5,10.6	4 4.5–8.0 4.9,6.1,7.5	5 4.0–42.2 4.9,9.1,9.2	5 3.4-77.9 3.5,9.3,15.8	2 5.4-13.9	3 0.5-11.5 0.5,2.3,11.5		1 7.6	
Krasnogorskii R.												
Total	7 3.0–12.2 3.0,7.7,11.5	16 2.6–75.4 5.6,7.9,21.8	22 2.4–38.8 3.3,4.4,7.6	23 1.0–35.6 2.2,6.8,8.1	26 1.5–19.7 2.7,5.2,8.0	42 0.1–63.1 3.8,6.7,10.0	31 0.8-80.4 4.3,9.2,15.8	37 3.0-27.1 5.5,7.0,11.3	44 0.5-75.9 3.8,6.9,11.9	24 2.0-85.4 6.4,10.8,14.8	3 7.6-30.1 7.6,12.4,30.1	

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-T07. Distribution of urinary iodine excretion levels (µg/dl) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys.

Place of residence	Age (years) at the time of examination 6	7	8	9	10	11	12	13	14	15	16	17
Kiev City		2 4.1–8.5		1 8.2	1 6.2		1 80.1	2 0.9–2.4	1 26.8			
Polesskii R.												
Ivankovskii R.			1 2.4	3[a] 0.1–0.7[b] 0.1,0.2,0.7[c]	1 0.5		1 14.1					
Borodyanskii R.			8 0.2–13.7 2.6,5.7,7.0	7 1.4–32.4 1.7,8.2,23.2	1 8.5	8 0.8–22.5 3.6,8.6,15.2	5 4.3–55.3 5.3,7.4,11.0	1 5.8		1 22.5		
Vishgorodskii R.			18 0.2–44.5 10.7,18.2,25.1	8 1.4–32.1 2.2,7.0,16.6	12 0.2–35.6 3.8,8.0,29.2	4 1.0–20.5 2.9,8.3,16.2	6 1.7–79.2 5.6,5.7,18.0	16 0.1–20.3 2.2,6.2,9.1	18 0.6–102.3 1.9,7.8,13.3	1 2.4	3 0.2–5.8 0.2,2.3,5.8	1 11.5
Irpenskii R.			5 1.0–98.0 4.8,65.8,81.8	17 0.1–27.3 3.0,8.5,17.1	31 0.3–43.6 5.0,7.9,16.0	29 4.8–37.4 11.1,14.7,18.2	40 1.6–68.8 10.7,15.5,20.4	32 2.3–79.0 8.6,16.3,27.2	76 2.1–93.1 6.6,11.2,28.1	15 2.0–47.9 4.7,15.9,27.1	22 5.2–80.0 6.9,9.8,20.2	3 4.5–32.2 4.5,14.8,32.2
K. Svyatoshinskii R.		1 1.0	6 0.5–66.9 1.1,4.7,25.4	5 0.3–11.8 0.4,6.9,6.9	7 0.3–15.8 0.3,7.1,10.1	6 0.9–12.9 2.1,3.9,10.4	3 0.6–33.4 0.6,5.4,33.4	23 0.6–60.9 1.7,4.4,10.5	20 0.9–21.5 2.1,6.1,9.7	18 0.4–13.8 2.3,5.3,9.4	4 1.0–16.4 2.8,7.7,13.6	6 0.5–31.3 0.7,5.3,8.1
Makarovskii R.					2 2.0–8.4		1 55.7					
Brovarskii R.			1 7.6	5 1.0–3.6 1.5,2.1,2.8	7 0.6–28.4 1.8,3.5,10.5	19 0.4–45.8 3.0,7.2,13.5	15 0.7–43.3 3.0,7.7,31.3	14 0.1–21.0 3.3,5.5,9.4	14 0.5–95.7 2.3,5.0,11.8	3 5.1–23.5 5.1,13.8,23.5	1 15.5	2 10.2–19.7
Vasilkovskii R.												
Fastovskii R.												
Zgurovskii R.												
Baryshevskii R.						5 1.7–8.4 3.0,3.2,6.5	1 5.7					
Borispolskii R.			2 0.3–0.8	2 0.4–2.0	3 0.2–0.4 0.2,0.3,0.4	3 0.1–0.3 0.1,0.2,0.3	1 0.2	1 0.7	1 0.4	1 0.7		

(cont.)

A31-T07. Continued

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Obukhovskii R.		2 0.4—5.3	2 1.9—133.9	1 8.5	2 1.3—19.6	5 0.6—3.8 0.9,2.1,2.9	3 0.4—1.9 0.4,0.7,1.9	1 0.4	4 0.4—9.7 0.4,0.8,5.4	3 0.5—3.1 0.5,1.5,3.1		
Belotserkovskii R.		1 3.5		5 2.3—6.8 4.8,6.2,6.6	3 2.3—12.9 2.3,6.1,12.9	5 0.1—7.2 4.5,4.7,6.3	2 0.8—5.7	2 2.2—7.9	4 5.1—14.7 5.2,7.2,11.9	2 9.3—11.5		
Skvirskii R.												
Yagotinskii R.												
P. Khmelnitskii R.												
Kagarlytskii R.				2 0.3—7.0	1 0.2	4 5.2—12.1 6.5,8.7,10.8	2 8.4—10.1	1 7.6	1 9.4	1 8.4	1 16.1	
Rakitnyanskii R.			2 9.0—11.9	2 6.6—11.1	1 0.5	4 0.2—83.5 0.6,7.2,48.4	2 17.4—33.1	3 7.2—21.8 7.2,9.9,21.8	2 2.6—7.7			
Volodarskii R.												
Mironovskii R.												
Boguslavskii R.				5 11.1—85.0 25.8,65.8,76.7	2 7.0—21.2	3 32.2—85.1 32.2,32.3,85.1	1 39.8	5 11.0—80.7 18.5,20.3,54.3				
Taraschanskii R.									1 17.0			
Stavischenskii R.			1 1.3	4 2.6—10.8 5.5,8.6,9.7			1 35.5	2 3.0—37.5	3 3.6—13.7 3.6,5.2,13.7			
Tetievskii R.					2 29.5—39.1	2 19.2—40.0	2 14.0—37.2	3 4.5—94.3 4.5,26.8,94.3	1 94.3	1 2.5		
Total		6 0.4—8.5 1.0,3.8,5.3	46 0.2—133.9 2.4,8.3,23.9	67 0.1—85.0 2.1,6.8,11.4	77 0.2—43.6 2.3,7.1,14.8	98 0.1—85.1 3.7,8.6,16.3	87 0.2—80.1 5.7,13.7,22.2	106 0.1—94.3 3.3,7.3,18.1	146 0.4—102.3 4.3,8.1,17.7	46 0.4—47.9 2.9,7.3,13.8	32 0.2—80.0 5.7,9.2,16.2	12 0.5—32.2 3.9,9.1,17.2

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-T08. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Kiev City		3[a]	4	1	1	1	3	3	6	1		1
		1.1—5.6[b]	6.8—14.6	17.6	1.1	7.1	10.0—192.7	5.9—30.5	1.4—73.0	6.8		0.6
		1.1,1.9,5.6[c]	7.5,8.7,11.9				10.0,19.2,192.7	5.9,6.4,30.5	6.4,7.5,8.1			
Polesskii R.												
Ivankovskii R.			3	2					2		1	
			1.8—12.2	0.9—24.7					0.1—10.0		0.2	
			1.8,2.5,12.2									
Borodyanskii R.			7	1	3	6	12	6	2			
			1.5—12.2	7.6	4.8—15.2	2.3—75.8	0.7—50.1	0.5—20.8	8.3—14.9			
			2.0,7.3,11.1		4.8,7.6,15.2	2.7,8.1,18.6	4.8,15.3,28.2	3.7,9.9,15.0				
Vishgorodskii R.		1	14	6	3	6	8	18	26	11	2	
		7.7	0.1—79.3	0.5—10.4	2.0—11.3	2.9—12.1	5.1—93.6	0.3—66.4	0.1—69.0	0.2—29.5	8.1—27.9	
			0.7,6.3,8.4	1.4,3.2,6.8	2.0,2.3,11.3	4.9,9.7,12.0	9.3,18.0,64.0	2.2,8.5,32.5	7.0,13.6,40.2	2.8,7.8,19.4		
Irpenskii R.			9	17	43	48	28	30	45	11	35	2
			6.4—80.9	2.2—96.7	0.8—109.3	0.8—62.6	2.4—68.8	0.6—81.0	3.0—90.2	0.1—91.9	0.3—84.9	7.2—22.0
			10.1,23.9,49.2	6.5,14.3,27.4	8.1,13.4,23.2	10.9,16.9,27.7	13.2,19.4,29.7	3.6,9.0,15.9	9.1,20.4,34.5	0.6,9.4,23.9	9.5,15.2,26.1	
K. Svyatoshinskii R.		1	4	4	7	5	11	20	18	11	7	6
		8.2	1.3—8.5	0.6—7.1	0.6—30.5	0.2—26.3	0.4—33.4	0.6—48.7	0.8—71.1	1.6—37.5	0.2—13.4	0.3—31.4
			1.9,3.1,6.1	3.5,6.7,7.0	0.7,2.3,14.7	4.8,7.8,10.6	0.5,1.9,13.6	2.2,4.8,9.5	5.6,8.5,12.4	3.3,5.8,26.7	0.6,3.5,5.9	0.4,3.6,5.9
Makarovskii R.					1							
					3.5							
Brovarskii R.		1	2	2	14	15	19	8	4	6	4	1
		5.8	2.0—5.8	8.0—11.8	0.4—31.3	1.7—52.1	0.6—38.3	0.5—29.5	2.4—11.6	1.8—50.5	1.0—51.0	1.3
					2.5,5.0,9.0	3.4,12.2,29.5	2.4,9.4,18.0	4.4,5.6,18.9	2.5,4.5,9.0	3.1,5.7,14.9	1.0,1.8,26.8	
Vasilkovskii R.												
Fastovskii R.							2			1		
							0.5—0.9			1.9		
Zgurovskii R.												
Baryshevskii R.							4	1				
							2.3—8.2	3.1				
							2.7,5.3,7.9					
Borispolskii R.			1	1	1	1	1		4		1	
			0.1	0.3	0.5	0.3	0.2		0.1—1.7		0.5	
									0.2,0.5,1.2			

(cont.)

A31-T08. Continued

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Obukhovskii R.		2 2.9—6.9	1 5.3	4 2.1—121.2 2.4,4.2,63.5	3 0.5—4.7 0.5,3.9,4.7	1 0.9	3 0.3—2.9 0.3,0.9,2.9	1 0.6	2 0.1—0.4	1 0.3	1 3.1	
Belotserkovskii R.		1 6.5	4 3.0—5.9 3.7,5.1,5.9	8 0.9—26.2 1.3,3.4,5.3		3 5.5—7.1 5.5,6.2,7.1	1 5.5	1 0.9	2 6.0—6.9	1 7.3		
Skvirskii R.												
Yagotinskii R.												
P. Khmelnitskii R.												
Kagarlytskii R.				1 0.3	3 0.1—7.3 0.1,0.2,7.3	4 0.4—9.2 1.6,4.5,7.7	7 0.1—12.6 1.1,7.4,10.6	4 0.5—9.9 1.2,2.4,6.4	5 1.7—69.0 9.2,10.9,11.1	1 14.6	1 21.3	
Rakitnyanskii R.			1 2.3	2 21.4—348.0	1 2.0	3 1.8—9.5 1.8,4.3,9.5	6 0.2—70.1 2.6,16.1,25.7	6 1.9—84.3 3.1,39.2,77.7				2 2.1—220.0
Volodarskii R.												
Mironovskii R.												
Boguslavskii R.				1 18.0	3 5.7—73.9 5.7,27.3,73.9	5 11.6—51.0 16.9,20.1,32.9	3 18.0—41.1 18.0,31.7,41.1	5 6.5—44.0 13.4,25.7,43.6		1 84.9		
Taraschanskii R.				1 7.4								
Stavischenskii R.				2 0.9—11.9	2 10.1—29.2	3 9.1—33.6 9.1,22.2,33.6		2 4.6—27.2	2 1.0—9.2		1 16.2	
Tetievskii R.					1 8.9	1 4.5	2 19.0—35.7				2 2.4—58.7	
Total		9 1.1—8.2 2.9,5.8,6.9	50 0.1—80.9 2.5,6.4,10.8	53 0.3—348.0 2.7,6.8,17.6	86 0.1—109.3 3.0,8.4,18.0	104 0.2—75.8 6.1,12.1,22.6	110 0.1—192.7 3.1,12.6,23.4	105 0.3—84.3 3.2,7.4,18.4	119 0.1—90.2 5.7,10.9,26.1	45 0.1—91.9 2.8,7.3,19.4	55 0.2—84.9 3.5,12.3,23.4	12 0.3—220.0 0.9,3.8,14.6

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-T09. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Koroston City	1 4.4	42[a] 0.1–36.6[b] 0.8,3.2,8.2[c]	16 0.2–910.3 0.7,1.3,12.0	6 0.5–48.4 1.4,1.9,3.5	23 0.2–67.7 1.6,4.3,41.0	11 0.3–41.4 0.8,12.8,20.1	2 0.6–54.0	14 0.2–17.6 1.6,4.2,11.2	6 0.3–19.6 0.9,2.6,9.6	2 4.2–4.9	6 3.3–94.0 4.6,5.9,13.9	1 17.0
Ovruchskii R.		1 6.0		1 5.1	5 2.3–5.8 3.2,4.4,5.8	2 2.6–8.8	1 8.3			1 0.3		
Olevskii R.			2 2.4–85.1	6 3.1–36.4 5.4,14.7,19.0	5 5.6–49.6 5.6,5.8,30.6	7 1.0–28.8 1.4,2.4,24.5	6 0.9–88.2 6.7,19.6,50.9	7 1.9–18.3 4.6,9.0,14.4	7 1.2–20.0 1.3,4.9,9.8	6 0.7–0.9 0.8,0.8,0.9	5 0.7–39.2 1.0,1.0,12.0	1 1.9
Narodichskii R.			1 2.1		4 1.0–7.1 1.8,3.9,6.1		1 1.9	1 2.1	2 4.4–20.2	1 8.1		
Korostenskii R.	1 0.6	2 0.9–55.1	1 0.8	7 0.4–10.3 0.7,2.6,4.8	15 0.3–7.8 0.9,1.1,2.5	8 0.3–7.1 0.6,0.9,1.2	8 0.4–42.9 0.8,2.4,34.3	10 1.0–49.0 2.6,11.8,17.7	12 0.7–71.4 2.1,9.4,42.4	2 0.2–11.0	1 0.8	
Luginskii R.			2 1.3–1.5	3 0.8–5.2 0.8,1.2,5.2	3 0.4–0.6 0.4,0.4,0.6	2 0.6–0.6	3 1.3–1.5 1.3,1.4,1.5	2 0.1–2.2	2 0.2–1.1	1 3.2	1 0.3	
Emilchinskii R.			5 3.1–16.6 3.5,5.6,7.5	5 3.0–11.6 5.9,7.2,7.7	11 5.5–30.0 9.1,9.8,23.4	15 0.9–20.9 6.4,7.7,13.8	19 0.7–25.8 2.4,5.3,12.6	8 4.9–17.9 6.7,7.6,8.9	3 6.4–24.3 6.4,15.8,24.3	1 1.2		
Malinskii R.	2 3.2–3.9	2 1.1–6.2	3 1.2–7.0 1.2,2.6,7.0	6 2.3–16.9 2.5,3.7,8.5	4 0.2–1.8 0.5,0.9,1.4	2 4.5–8.2	2 8.4–26.5		1 6.8			
V. Volinskii R.			1 0.2	3 6.5–10.6 6.5,6.6,10.6	8 0.5–36.1 1.6,3.3,17.0	27 0.1–13.3 1.1,2.7,3.9	17 0.1–48.7 0.3,2.3,7.8	7 0.3–12.1 0.4,1.5,8.4	8 0.3–8.2 1.0,3.5,6.3	9 0.1–10.7 1.1,2.3,8.7	3 0.2–4.1 0.2,0.5,4.1	
N. Volinskii R.	1 23.2		2 3.3–27.0	3 3.3–5.2 3.3,4.5,5.2	7 0.1–16.5 0.7,1.2,5.3		1 3.4	5 6.2–60.3 7.5,9.5,29.3	1 19.1			
Radomishliskii R.												
Brusilovskii R.												
Total	5 0.6–23.2 3.2,3.9,4.4	47 0.1–55.1 0.9,3.3,8.2	33 0.2–910.3 1.1,2.4,7.5	41 0.4–48.4 2.3,4.5,7.7	87 0.1–67.7 1.0,4.3,9.2	74 0.1–41.4 1.1,3.3,9.6	60 0.1–88.2 1.4,4.6,13.1	54 0.1–60.3 2.1,6.9,11.9	42 0.2–71.4 1.3,5.4,15.8	23 0.1–11.0 0.8,1.2,5.7	16 0.2–94.0 0.7,3.7,9.5	2 1.9–17.0

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A31-T10. Distribution of urinary iodine excretion levels (μg/dl) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Korosten City	2 1.0—300.3	34[a] 0.1—32.5[b] 0.5,2.0,6.3[c]	14 0.2—36.5 0.9,3.7,9.2	10 0.3—59.5 0.9,21.1,45.0	24 0.2—58.9 0.6,5.0,43.9	7 0.3—12.6 2.2,3.7,5.0	4 0.5—18.3 0.5,3.8,12.7	17 0.2—35.2 0.9,2.4,8.1	7 0.2—18.2 0.8,2.7,10.1	5 0.5—4.7 1.1,2.1,4.2	9 0.5—44.7 0.6,2.1,7.4	1 7.2
Ovruchskii R.			2 0.2—1.2	1 3.2	1 3.9		3 1.0—11.3 1.0,5.0,11.3	2 0.2—2.2	3 6.0—9.7 6.0,6.9,9.7	1 0.9		
Olevskii R.			1 7.8	7 0.1—47.8 2.1,5.9,36.2	8 0.8—13.0 5.0,6.4,9.5	4 0.8—54.3 1.4,6.6,32.7	14 0.8—21.4 2.4,3.4,7.4	7 0.7—94.2 4.3,6.7,21.5	4 0.9—6.9 3.0,5.5,6.4	9 0.8—39.4 1.2,5.2,32.0	9 0.3—64.5 0.9,4.8,29.4	1 21.6
Narodichskii R.					5 2.1—26.5 11.8,15.0,15.7			1 11.1	1 1.3			
Korostenskii R.		2 5.1—16.7	2 1.7—7.2	5 0.1—2.8 0.3,0.7,0.7	5 1.1—23.4 1.4,1.6,2.0	7 0.4—22.1 1.3,5.5,18.5	5 0.3—42.2 2.0,7.6,17.1	11 0.2—43.3 1.3,10.1,42.0	6 0.7—43.5 3.4,12.5,42.2	2 1.3—43.8	3 1.5—12.5 1.5,10.7,12.5	
Luginskii R.			2 1.7—2.2		1 2.2	2 0.3—2.2	3 0.1—6.4 0.1,5.9,6.4	2 0.5—4.5	1 0.3	6 0.1—18.5 0.2,1.0,1.8	2 2.9—3.6	1 1.4
Emilchinskii R.			3 1.6—83.9 1.6,23.5,83.9	6 3.1—46.3 7.0,12.5,18.6	11 1.4—19.4 3.1,4.8,15.6	16 0.3—14.9 5.2,7.6,10.7	12 2.1—25.7 3.1,9.5,14.8	12 1.3—15.0 3.0,6.5,7.6	5 3.6—32.8 3.8,10.4,19.1	1 4.9		
Malinskii R.			3 0.9—6.8 0.9,5.1,6.8	1 0.9	2 1.3—3.4	3 1.6—5.3 1.6,5.1,5.3	1 1.9	2 0.5—4.3				
V. Volinskii R.			1 4.4	6 0.5—7.0 0.6,0.7,1.4	5 1.5—11.6 3.8,6.2,9.0	17 0.4—27.3 3.1,4.4,7.0	12 0.1—44.2 0.4,1.5,3.0	5 0.3—6.8 2.5,2.6,3.5	11 0.1—9.9 0.6,4.4,6.6	7 0.6—58.4 0.7,3.2,6.8	9 0.1—23.1 0.3,0.7,17.1	
N. Volinskii R.			2 2.7—3.5	3 0.3—38.7 0.3,1.0,38.7	6 2.3—88.4 4.2,17.1,42.0	6 1.2—5.1 1.4,3.3,3.6	4 2.1—8.0 2.1,3.1,6.0	4 0.9—6.1 1.0,1.6,4.1	4 0.3—17.8 3.0,6.0,12.0		1 2.4	
Radomishliskii R.												
Brusilovskii R.												
Total	2 1.0—300.3	36 0.1—32.5 0.5,2.4,7.9	30 0.2—83.9 1.6,3.5,7.8	39 0.1—59.5 0.7,2.8,18.6	68 0.2—88.4 2.1,5.6,15.7	63 0.3—54.3 2.2,5.0,9.3	58 0.1—44.2 1.9,3.3,9.6	63 0.2—94.2 1.1,4.3,8.5	42 0.1—43.5 1.3,5.1,9.7	31 0.1—58.4 0.9,2.1,6.8	33 0.1—64.5 0.6,3.6,12.5	3 1.4—21.6 1.4,7.2,21.6

[a]Number of subjects; [b]Range of urinary iodine excretion levels. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of urinary iodine excretion levels. Data are not given if the number of subjects was less than three.

A32-T01. Number of children with blood cell counts and differential leukocyte counts by place of residence and year of examination. Gomel region, Belarus.

Place of residence	Year of examination							
	1991		1992		1993		1994	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	221 (0)[a]	255 (1)	48 (27)	46 (38)	607 (582)	668 (637)	342 (338)	379 (375)
Mozir City	7 (0)	6 (0)	4 (2)	2 (2)	19 (18)	29 (24)	1 (1)	
Dobrushskii R.	188 (0)	219 (0)	305 (241)	350 (271)	17 (17)	19 (18)	5 (5)	9 (9)
Vetkovskii R.		4 (0)			17 (17)	12 (11)	8 (8)	12 (12)
Gomelskii R.	52 (0)	40 (0)	431 (191)	518 (194)	750 (692)	788 (722)	1004 (941)	979 (913)
Loevskii R.	2 (0)	3 (0)	229 (11)	192 (12)	46 (43)	52 (48)	10 (10)	15 (15)
Braginskii R.	250 (1)	222 (0)		1 (0)	12 (12)	12 (12)	1 (1)	6 (6)
Checherskii R.			28 (0)	33 (0)	3 (3)	3 (3)	1 (1)	2 (2)
Buda-Koshelevskii R.	116 (0)	143 (0)	2 (2)	1 (1)	25 (25)	37 (37)	7 (7)	11 (11)
Rechitskii R.	6 (0)	7 (0)	3 (0)	4 (1)	28 (26)	28 (25)	766 (719)	779 (720)
Hoynikskii R.			153 (128)	141 (99)	8 (8)	3 (3)	8 (8)	10 (10)
Narovlyanskii R.	2 (0)	1 (0)						
Kormyanskii R.	3 (0)	1 (0)	45 (38)	47 (39)	4 (4)	6 (6)	2 (2)	4 (4)
Rogachevskii R.		4 (0)	2 (2)	2 (2)	8 (8)	9 (9)	301 (267)	344 (307)
Zlobinskii R.	12 (0)	7 (0)	4 (4)	4 (4)	10 (9)	24 (22)	188 (180)	246 (230)
Svetlogorskii R.	2 (0)	1 (0)	2 (1)	2 (2)	16 (15)	23 (21)	4 (4)	4 (4)
Kalinkovichskii R.	4 (0)	3 (0)	2 (1)	6 (6)	13 (12)	13 (13)	1 (1)	
Mozirskii R.				1 (0)	3 (3)	6 (6)		3 (3)
Elskii R.			129 (101)	173 (126)	2 (2)	3 (3)	3 (3)	7 (7)
Oktyabrskii R.	2 (0)			1 (1)		8 (8)	8 (8)	9 (9)
Petrikovskii R.	56 (0)	90 (0)		2 (2)	8 (7)	6 (6)	6 (6)	4 (4)
Lelchitskii R.	16 (0)	26 (0)			4 (4)	18 (17)	1 (1)	7 (7)
Zitkovichskii R.					1 (1)	1 (1)		1 (1)
Total	939 (1)	1032 (1)	1387 (749)	1526 (800)	1601 (1508)	1768 (1652)	2667 (2511)	2831 (2649)

(cont.)

A32-T01. Continued.

Place of residence	Year of examination				Total	
	1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	300 (292)	390 (384)	40 (40)	62 (62)	1558 (1279)	1800 (1497)
Mozir City	17 (17)	16 (13)	5 (5)	9 (9)	53 (43)	62 (48)
Dobrushskii R.	17 (17)	19 (19)			532 (280)	616 (317)
Vetkovskii R.	6 (6)	9 (8)	2 (2)	3 (3)	33 (33)	40 (34)
Gomelskii R.	840 (809)	814 (781)	519 (494)	490 (474)	3596 (3127)	3629 (3084)
Loevskii R.	13 (13)	16 (16)	1 (1)		301 (78)	278 (91)
Braginskii R.		2 (2)		1 (1)	263 (14)	244 (21)
Checherskii R.	6 (6)	14 (14)			38 (10)	52 (19)
Buda-Koshelevskii R.	169 (166)	206 (204)	5 (5)	2 (2)	324 (205)	400 (255)
Rechitskii R.	29 (29)	37 (36)	47 (47)	52 (51)	879 (821)	907 (833)
Hoynikskii R.	404 (380)	354 (328)	2 (2)		575 (526)	508 (440)
Narovlyanskii R.	1 (1)				3 (1)	1 (0)
Kormyanskii R.	37 (37)	38 (37)		1 (1)	91 (81)	97 (87)
Rogachevskii R.	7 (7)	14 (13)			318 (284)	373 (331)
Zlobinskii R.	1 (1)	17 (17)		1 (1)	215 (194)	299 (274)
Svetlogorskii R.	9 (8)	24 (24)	6 (6)	3 (3)	39 (34)	57 (54)
Kalinkovichskii R.	33 (33)	22 (21)			53 (47)	44 (40)
Mozirskii R.	4 (4)	7 (7)		1 (1)	7 (7)	18 (17)
Elskii R.	9 (9)	9 (9)	1 (1)	1 (1)	144 (116)	193 (146)
Oktyabrskii R.	6 (6)	6 (6)		1 (1)	16 (14)	25 (25)
Petrikovskii R.	9 (9)	8 (8)		1 (1)	79 (22)	111 (21)
Lelchitskii R.	31 (31)	44 (42)		1 (1)	52 (36)	96 (67)
Zitkovichskii R.	4 (3)	11 (11)			5 (4)	13 (13)
Total	1952 (1884)	2077 (2000)	628 (603)	629 (612)	9174 (7256)	9863 (7714)

[a]Numbers in parentheses refer to the number of children with differential leukocyte counts. The distinction between the two numbers is for the Gomel region only, where analysis of hemograms was started in mid-1992.

A32-T02. Number of children with blood cell counts and differential leukocyte counts by place of residence and year of examination. Mogilev region, Belarus.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	65	60	792	856	1713	1775	1445	1505	991	1112	505	420	5511	5728
Bobruisk City					6	2				2			6	4
Hotimskii R.			1		14	11	40	17					55	28
Klimovichskii R.	44	40			1		98	74	131	149			274	263
Kostyukovichskii R.			135	154	53	65	42	45	3	3			233	267
Mstislavskii R.									1				1	
Krichevskii R.	131	142			1	3	1		10	12			143	157
Cherikovskii R.			98	108	40	52	262	276	11	14	36	40	447	490
Krasnopolskii R.			28	31	124	129	307	258	239	230	166	195	864	843
Goretskii R.				1	1	2			11	19			12	22
Chausskii R.	77	75	218	245	350	371	148	146	116	120		3	909	960
Slavgorodskii R.	176	188					4	11	16	13	82	77	278	289
Shklovskii R.							1	1	1	6			2	7
Mogilevskii R.	2	1	973	942	117	114	98	99	146	126	160	179	1496	1461
Bykhovskii R.	137	157	1		566	545	246	318	183	180	30	38	1163	1238
Kruglianskii R.							1					1	1	1
Belynichskii R.			1	1	1	1	1	2					3	4
Klichevskii R.			60	49		1							60	50
Kirovskii R.								1	1	1			1	2
Bobruiskii R.					5	14		1	2				7	15
Osipovichskii R.				1			2		1	2			3	3
Glusskii R.					27	23	2			1			29	24
Total	632	663	2307	2388	3019	3108	2698	2754	1863	1990	979	953	11498	11856

A32-T03. Number of children with blood cell counts and differential leukocyte counts by place of residence and year of examination. Bryansk region, Russian Federation.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	351	315	1286	1417	2910	2881	626	511	358	518	35	31	5566	5673
Gordeevskii R.		1					639	656	26	30			665	687
Klintsovskii R.	1	1	115	122	444	388	1	11	74	77	3	3	638	602
Novozybkovskii R.			1		910	902	489	488					1400	1390
Zlynkovskii R.	1						811	880					812	880
Krasnogorskii R.							1		373	448	418	380	792	828
Total	353	317	1402	1539	4264	4171	2567	2546	831	1073	456	414	9873	10060

A32-T04. Number of children with blood cell counts and differential leukocyte counts by place of residence and year of examination. Kiev region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City	1	2	11	15	160	224	135	142	46	54	35	36	388	473
Polesskii R.	107	119	281	283	5	5							393	407
Ivankovskii R.	292	266	101	115	1	3	228	236	1	4		1	623	625
Borodyanskii R.	75	86	91	106	3	2	774	809	2			2	945	1005
Vishgorodskii R.	96	105	190	198	224	241	831	819	2	5	1	1	1344	1369
Irpenskii R.	1		137	202	242	222	618	743	1259	1213	606	589	2863	2969
K. Svyatoshinskii R.			1	3	496	515	184	206	721	742	255	286	1657	1752
Makarovskii R.	118	135	155	167	133	208		3	5	3		2	411	518
Brovarskii R.					486	499	247	261	78	88	2	1	813	849
Vasilkovskii R.					264	296	1	4					265	300
Fastovskii R.					219	392	10	6		3	1	1	230	402
Zgurovskii R.					1	1						1	1	2
Baryshevskii R.					96	71	32	22			45	40	173	133
Borispolskii R.					153	133	12	17	14	20	2	2	181	172
Obukhovskii R.					331	322	10	5	2	3	1	1	344	331
Belotserkovskii R.				1	187	197	25	23	2	2		1	214	224
Skvirskii R.					1	3	2	3		1			3	7
Yagotinskii R.							2	6		1	1	2	3	9
P. Khmelnitskii R.							9	6					9	6
Kagarlytskii R.				1	350	442	1	3			1	2	352	448
Rakitnyanskii R.							510	607	1	2			511	609
Volodarskii R.									605	710			605	710
Mironovskii R.					1	1	7	11		1			8	13
Boguslavskii R.					1		2	5	210	191	1		214	196
Taraschanskii R.						1	2	3	1	2		1	3	7
Stavischenskii R.						1	339	405					339	406
Tetievskii R.						1	2	1	256	337	2	1	260	340
Total	690	713	967	1091	3354	3780	3983	4346	3205	3382	953	970	13152	14282

A32-T05. Number of children with blood cell counts and differential leukocyte counts by place of residence and year of examination. Zhitomir region, Ukraine.

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	126	132	549	687	615	712	1511	1573	913	916	22	41	3736	4061
Ovruchskii R.	120	170	50	69	188	281	13	15	123	135	752	841	1246	1511
Olevskii R.	51	57	16	18	368	470	225	313	434	466		2	1094	1326
Narodichskii R.	31	64	95	124	28	20	188	229					342	437
Korostenskii R.	62	61	177	172	261	322	1048	1090	537	515		3	2085	2163
Luginskii R.	54	51	108	133	190	258	214	216	169	128			735	786
Emilchinskii R.	70	118	130	158	2	3	265	349	262	276	280	281	1009	1185
Malinskii R.	63	84	169	237	173	152		2	284	304	447	427	1136	1206
V. Volinskii R.	11	12	257	277	757	830	253	272	329	326			1607	1717
N. Volinskii R.	43	75	148	175	83	115	1	3	275	419			550	787
Radomishliskii R.	13	18											13	18
Brusilovskii R.	1		128	124									129	124
Total	645	842	1827	2174	2665	3163	3718	4062	3326	3485	1501	1595	13682	15321

A33-T01. Number of children with blood cell counts and differential leukocyte counts by age at the time of examination and year of examination. Gomel region, Belarus.

Age at the time of examination (years)	Year of examination							
	1991		1992		1993		1994	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	69 (0)[a]	72 (0)	5 (0)	4 (0)				
6	104 (0)	109 (0)	153 (59)	147 (64)	3 (3)	7 (6)		
7	101 (0)	111 (0)	182 (101)	176 (101)	184 (174)	181 (171)	23 (23)	25 (25)
8	126 (0)	132 (0)	187 (119)	166 (90)	292 (275)	302 (276)	312 (291)	354 (333)
9	123 (0)	121 (0)	151 (86)	173 (101)	262 (248)	267 (256)	424 (397)	375 (360)
10	86 (0)	123 (0)	155 (84)	163 (89)	208 (194)	204 (196)	363 (349)	418 (390)
11	93 (0)	101 (0)	121 (72)	171 (93)	157 (149)	207 (187)	379 (359)	387 (361)
12	90 (1)	92 (1)	150 (81)	182 (88)	125 (114)	181 (168)	384 (367)	387 (362)
13	69 (0)	77 (0)	118 (67)	135 (72)	124 (119)	157 (147)	363 (336)	390 (361)
14	61 (0)	77 (0)	105 (52)	138 (63)	103 (95)	124 (116)	307 (284)	332 (310)
15	17 (0)	17 (0)	59 (27)	69 (37)	69 (64)	52 (49)	88 (81)	134 (119)
16			1 (1)	2 (2)	38 (38)	49 (45)	20 (20)	27 (26)
17					36 (35)	37 (35)	4 (4)	2 (2)
18								
19								
Total	939 (1)	1032 (1)	1387 (749)	1526 (800)	1601 (1508)	1768 (1652)	2667 (2511)	2831 (2649)

(cont.)

A33-T01. Continued.

Age at the time of examination (years)	Year of examination				Total	
	1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls
5					74 (0)	76 (0)
6					260 (62)	263 (70)
7					490 (298)	493 (297)
8	23 (22)	24 (22)			940 (707)	978 (721)
9	273 (265)	300 (292)	22 (21)	24 (24)	1255 (1017)	1260 (1033)
10	347 (337)	354 (344)	121 (115)	111 (110)	1280 (1079)	1373 (1129)
11	326 (315)	325 (314)	111 (110)	98 (95)	1187 (1005)	1289 (1050)
12	325 (317)	348 (335)	99 (98)	96 (91)	1173 (978)	1286 (1045)
13	281 (270)	296 (288)	119 (112)	116 (114)	1074 (904)	1171 (982)
14	245 (232)	251 (235)	106 (99)	117 (114)	927 (762)	1039 (838)
15	106 (101)	138 (130)	44 (42)	56 (53)	383 (315)	466 (388)
16	23 (22)	36 (35)	5 (5)	5 (5)	87 (86)	119 (113)
17	2 (2)	5 (5)	1 (1)	6 (6)	43 (42)	50 (48)
18	1 (1)				1 (1)	
19						
Total	1952 (1884)	2077 (2000)	628 (603)	629 (612)	9174 (7256)	9863 (7714)

[a]Numbers in parentheses refer to the number of children with differential leukocyte counts. The distinction between the two numbers is for the Gomel region only, where analysis of hemograms was started in mid-1992.

A33-T02. Number of children with blood cell counts and differential leukocyte counts by age at the time of examination and year of examination. Mogilev region, Belarus.

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	92	96	14	6									106	102
6	142	139	168	147	24	17							334	303
7	117	109	226	213	344	295	10	9					697	626
8	78	89	246	261	294	282	286	285	20	23			924	940
9	74	61	220	233	313	303	431	434	214	195	26	23	1278	1249
10	36	56	263	257	367	349	397	405	258	275	130	119	1451	1461
11	23	41	280	292	329	402	379	365	301	311	130	141	1442	1552
12	25	31	271	316	319	340	288	290	325	322	126	126	1354	1425
13	29	21	271	245	368	349	255	290	232	280	120	133	1275	1318
14	15	17	238	239	292	332	308	262	277	259	151	151	1281	1260
15	1	3	89	139	224	230	200	208	145	211	159	136	818	927
16			21	40	137	200	111	168	80	94	98	85	447	587
17					8	9	33	38	10	17	37	39	88	103
18									1	2	2		3	2
19										1				1
Total	632	663	2307	2388	3019	3108	2698	2754	1863	1990	979	953	11498	11856

A33-T03. Number of children with blood cell counts and differential leukocyte counts by age at the time of examination and year of examination. Bryansk region, Russian Federation.

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	94	101											94	101
6	126	97	54	52	18	19							198	168
7	67	46	101	102	303	291	21	19					492	458
8	12	16	142	125	465	426	274	287	9	4			902	858
9	9	9	146	153	547	474	307	305	84	96	4	7	1097	1044
10	11	16	160	158	493	576	306	300	86	85	79	83	1135	1218
11	13	9	131	118	518	514	327	303	107	84	66	79	1162	1107
12	9	11	120	123	553	537	328	303	94	94	92	78	1196	1146
13	7	7	132	133	589	528	319	286	113	97	102	74	1262	1125
14	5	5	214	248	505	494	298	280	96	109	78	66	1196	1202
15			200	324	197	219	213	221	88	133	32	22	730	919
16			2	3	76	92	129	198	59	100	3	5	269	398
17						1	45	44	59	139			104	184
18									34	112			34	112
19									2	20			2	20
Total	353	317	1402	1539	4264	4171	2567	2546	831	1073	456	414	9873	10060

A33-T04. Number of children with blood cell counts and differential leukocyte counts by age at the time of examination and year of examination. Kiev region, Ukraine.

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	22	17											22	17
6	101	102	28	24	2	4							131	130
7	100	110	155	158	141	134	35	28					431	430
8	113	102	131	132	343	357	374	373	15	23			976	987
9	112	136	133	119	342	389	463	500	300	282	22	25	1372	1451
10	96	111	110	128	382	391	516	487	502	505	158	144	1764	1766
11	73	69	93	111	390	379	490	465	531	525	188	220	1765	1769
12	35	20	82	112	317	413	489	529	516	512	196	168	1635	1754
13	24	19	85	131	385	422	522	593	409	401	153	139	1578	1705
14	8	19	80	85	413	469	562	612	477	459	135	138	1675	1782
15	6	8	47	65	418	464	313	433	249	324	62	83	1095	1377
16			23	26	153	244	182	254	164	256	29	35	551	815
17					68	114	37	71	38	73	7	15	150	273
18								1	4	22	3	3	7	26
19														
Total	690	713	967	1091	3354	3780	3983	4346	3205	3382	953	970	13152	14282

A33-T05. Number of children with blood cell counts and differential leukocyte counts by age at the time of examination and year of examination. Zhitomir region, Ukraine.

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	23	28	6	11									29	39
6	58	66	69	61	38	26							165	53
7	49	50	165	194	168	128	126	139					508	511
8	79	106	232	260	303	303	367	357	46	27			1027	1053
9	98	130	238	273	284	284	434	459	399	421	14	24	1467	1591
10	125	169	219	246	310	347	507	477	433	475	184	184	1778	1898
11	93	104	199	226	260	319	440	519	426	461	215	241	1633	1870
12	54	65	178	207	285	298	400	467	504	496	205	237	1626	1770
13	41	76	206	233	311	366	442	502	415	454	224	237	1639	1868
14	19	31	195	300	266	367	437	492	438	424	250	237	1605	1851
15	6	17	75	109	212	348	288	321	363	376	230	218	1174	1389
16			45	54	208	332	231	266	257	278	127	169	868	1099
17					20	45	46	63	45	73	52	48	163	229
18														
19														
Total	645	842	1827	2174	2665	3163	3718	4062	3326	3485	1501	1595	13682	15321

A34-T01. Number of children with anemia by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	1				8	2	10	5	1	4	2		22	11
Mozir City														
Dobrushskii R.	5		2	2		2			1				8	4
Vetkovskii R.					1								1	
Gomelskii R.	1		2		5	3	11	2	9	4	2	4	30	13
Loevskii R.			5		1								6	
Braginskii R.	1				1								2	
Checherskii R.														
Buda-Koshelevskii R.									1				1	
Rechitskii R.							19	14	1	1	2		22	15
Hoynikskii R.			1						2	1			3	1
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.							2	7					2	7
Zlobinskii R.							1	1					1	1
Svetlogorskii R.									1	1	1		2	1
Kalinkovichskii R.														
Mozirskii R.														
Elskii R.														
Oktyabrskii R.								1						1
Petrikovskii R.	1	1											1	1
Lelchitskii R.					1								1	
Zitkovichskii R.														
Total	9	1	10	2	17	7	43	30	16	11	7	4	102	55

[a]Diagnosed when hemoglobin level < 110 g/l.

A34-T02. Number of children with anemia by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City			1	1	3	6	1	3	3	8	1	6	9	24
Bobruisk City														
Hotimskii R.														
Klimovichskii R.									1	2			1	2
Kostyukovichskii R.														
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.							1	1					1	1
Krasnopolskii R.						1	1	2		1		2	1	6
Goretskii R.														
Chausskii R.						1								1
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.			3	4									3	4
Bykhovskii R.												1		1
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total			4	5	3	8	3	6	4	11	1	9	15	39

[a]Diagnosed when hemoglobin level < 110 g/l.

A34-T03. Number of children with anemia by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City				1	1	4	6	6	1	6			8	17
Gordeevskii R.							5	4					5	4
Klintsovskii R.				1		1				3				5
Novozybkovskii R.					1	2		3					1	5
Zlynkovskii R.								4						4
Krasnogorskii R.											1	1	1	1
Total				2	2	7	11	17	1	9	1	1	15	36

[a]Diagnosed when hemoglobin level < 110 g/l.

A34-T04. Number of children with anemia by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					1	3	1	3					2	6
Polesskii R.	2			1									2	1
Ivankovskii R.	2	1		1			2						4	2
Borodyanskii R.		1	1				2	4					3	5
Vishgorodskii R.	1			1	1		1						3	1
Irpenskii R.					1			3	3	7		1	4	11
K. Svyatoshinskii R.					12	19		2		7	1	2	13	30
Makarovskii R.				2		1								3
Brovarskii R.					5	4		2		1			5	7
Vasilkovskii R.					1	2							1	2
Fastovskii R.					1	2		1					1	3
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.					2	2							2	2
Obukhovskii R.					4	7	1						5	7
Belotserkovskii R.														
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.					1	4							1	4
Rakitnyanskii R.							1	2					1	2
Volodarskii R.									2	5			2	5
Mironovskii R.														
Boguslavskii R.										6				6
Taraschanskii R.														
Stavischenskii R.							1						1	
Tetievskii R.										1				1
Total	5	2	1	5	29	44	9	17	5	27	1	3	50	98

[a]Diagnosed when hemoglobin level < 110 g/l.

A34-T05. Number of children with anemia by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City				1		4	2	12	2	15			4	32
Ovruchskii R.		1			1	2				3		6	1	12
Olevskii R.	1					4	2	3	1	2			4	9
Narodichskii R.								3						3
Korostenskii R.			1		1	1	5	6	2	7			9	14
Luginskii R.						1		3		1				5
Emilchinskii R.			1				2	1				1	3	2
Malinskii R.	1	1		1	2	1						3	3	6
V. Volinskii R.					8	7	1	1		2			9	10
N. Volinskii R.						2				1				3
Radomishliskii R.														
Brusilovskii R.				1										1
Total	2	2	2	3	12	22	12	29	5	31		10	33	97

[a]Diagnosed when hemoglobin level < 110 g/l.

A35-T01. Number of children with anemia by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5		1												1
6	2		3										5	
7				1	3	2	1						4	3
8	2		3		2	1	11	2					18	3
9	1		1	1	3	1	7	4	3	5			15	11
10	2		2		4		4	12	2	2	1	1	15	15
11							5	2	6		3		14	2
12	1				1	2	5		2	1			9	3
13					2		2	1	2	1	1	1	7	3
14	1				1	1	7	5			1	2	10	8
15			1		1			4	1	2	1		4	6
16							1						1	
17														
18														
19														
Total	9	1	10	2	17	7	43	30	16	11	7	4	102	55

[a]Diagnosed when hemoglobin level <110 g/l.

A35-T02. Number of children with anemia by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6			1	1									1	1
7			2		2	2							4	2
8			1			2	1						2	2
9							1	2	1				2	2
10						1					1	4	1	5
11							1		1	1		1	2	2
12									1	1			1	1
13					1					2			1	2
14						2			1	3		2	1	7
15				2				2		3				7
16				2		1		2		1		2		8
17														
18														
19														
Total			4	5	3	8	3	6	4	11	1	9	15	39

[a]Diagnosed when hemoglobin level < 110 g/l.

A35-T03. Number of children with anemia by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6														
7				1		1								2
8							2						2	
9					1	1	5	4	1				7	5
10							1	1		1	1	1	2	3
11					1	1	1	1					2	2
12								1						1
13						1	2	2					2	3
14				1				3						4
15						1		3		2				6
16						2		2						4
17										3				3
18										3				3
19														
Total				2	2	7	11	17	1	9	1	1	15	36

[a]Diagnosed when hemoglobin level < 110 g/l.

A35-T04. Number of children with anemia by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	1												1	
6														
7	1	1		1	2	2							3	4
8	1	1		1	8	4	3	1					12	7
9			1		2	4	2	1					5	5
10	1					2		1		2			1	5
11					4	6			1	3	1		6	9
12	1				2	2			2	1			5	3
13				1	3	5	1	2	1	6			5	14
14				1	4	7	1	6	1	3		1	6	18
15				1	3	2		4		3		2	3	12
16					1	8	2	2		6			3	16
17						2				3				5
18														
19														
Total	5	2	1	5	29	44	9	17	5	27	1	3	50	98

[a]Diagnosed when hemoglobin level <110 g/l.

A35-T05. Number of children with anemia by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6	1				2								3	
7	1			1			2	1					3	2
8			1		1	2	3	3					5	5
9		1		1	2	1	3	2	1	1			6	6
10		1	1		1	1	2	3		5			4	10
11					2	2		1		1			2	4
12					1	2			1	1			2	3
13					1	3	2	3		2			3	8
14						3		4	3	5		1	3	13
15					1	4		4		10		6	1	24
16				1	1	4		6		6		1	1	18
17								2				2		4
18														
19														
Total	2	2	2	3	12	22	12	29	5	31		10	33	97

[a]Diagnosed when hemoglobin level < 110 g/l.

A36-T01. Number of children with leukocytopenia by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	1				6	3	5	2		1	1	1	13	7
Mozir City														
Dobrushskii R.	5		2	1									7	1
Vetkovskii R.					1								1	
Gomelskii R.	1		2	3	2	1	9	2	7	3	1	3	22	12
Loevskii R.			2		1								3	
Braginskii R.					1								1	
Checherskii R.														
Buda-Koshelevskii R.														
Rechitskii R.							7	3			2		9	3
Hoynikskii R.			1						1	3			2	3
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.						1								1
Zlobinskii R.														
Svetlogorskii R.											1		1	
Kalinkovichskii R.														
Mozirskii R.														
Elskii R.														
Oktyabrskii R.														
Petrikovskii R.	1												1	
Lelchitskii R.					1								1	
Zitkovichskii R.														
Total	8		7	4	12	5	21	7	8	7	5	4	61	27

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A36-T02. Number of children with leukocytopenia by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	3		9	6	15	9	17	10	25	9	65	33	134	67
Bobruisk City														
Hotimskii R.							1						1	
Klimovichskii R.									2	2			2	2
Kostyukovichskii R.					3								3	
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.							1						1	
Krasnopolskii R.										1	8	2	8	3
Goretskii R.														
Chausskii R.			1			2	1	1					2	3
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.			2	1	1			1	2	2	3	1	8	5
Bykhovskii R.					5	2				1			5	3
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total	3		12	7	24	13	20	12	29	15	76	36	164	83

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A36-T03. Number of children with leukocytopenia by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City			9	4	23	10	3	1	3	2			38	17
Gordeevskii R.							3		2				5	
Klintsovskii R.					3	2			3	2			6	4
Novozybkovskii R.					10	3	2	6					12	9
Zlynkovskii R.							5	2					5	2
Krasnogorskii R.									4	4	4	1	8	5
Total			9	4	36	15	13	9	12	8	4	1	74	37

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A36-T04. Number of children with leukocytopenia by place of residence and year of examination. Kiev region, Ukraine[a].

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					4	2	1	1		1			5	4
Polesskii R.			1										1	
Ivankovskii R.		1	1				1						2	1
Borodyanskii R.							1						1	
Vishgorodskii R.					9	1	3	3					12	4
Irpenskii R.			1	1			2		2	2	3	2	8	5
K. Svyatoshinskii R.					4	3			6	1	1		11	4
Makarovskii R.														
Brovarskii R.					3		1		1				5	
Vasilkovskii R.														
Fastovskii R.					2								2	
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.					3	1							3	1
Obukhovskii R.					14	9							14	9
Belotserkovskii R.					2	1							2	1
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.					3	1							3	1
Rakitnyanskii R.								1						1
Volodarskii R.									2				2	
Mironovskii R.							1						1	
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.							1	2					1	2
Tetievskii R.									2				2	
Total		1	3	1	44	18	11	7	13	4	4	2	75	33

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A36-T05. Number of children with leukocytopenia by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City					4	1	7	2	9				20	3
Ovruchskii R.														
Olevskii R.							3						3	
Narodichskii R.					1								1	
Korostenskii R.		1			1			1	1				2	2
Luginskii R.	2									1			2	1
Emilchinskii R.														
Malinskii R.			2						1		4	1	7	1
V. Volinskii R.			1	1	2								3	1
N. Volinskii R.		1	2						2				4	1
Radomishliskii R.														
Brusilovskii R.														
Total	2	2	5	1	8	1	10	3	13	1	4	1	42	9

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A37-T01. Number of children with leukocytopenia by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6	1		1										2	
7					2								2	
8	2		2		1		3	1					8	1
9	1		1	1	3	1	1	1	1				7	3
10	2		2	1	3	1		2	1	2	1		9	6
11						1	3	1	5	1	1	2	9	5
12	1				1	1	4	1	1				7	2
13				1	1	1	2			1	1		4	3
14	1			1			7	1		1	1	1	9	4
15			1		1					2	1	1	3	3
16							1						1	
17														
18														
19														
Total	8		7	4	12	5	21	7	8	7	5	4	61	27

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A37-T02. Number of children with leukocytopenia by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6	1					1							1	1
7	1		2		5								8	
8			1		3		2						6	
9				2		1	5	2	3	1	3	1	11	7
10				1	1	2	4	2	2	1	8	6	15	12
11			3		4	1	2	2	3	2	17	13	29	18
12	1		1		4	2	2	1	8	2	10	6	26	11
13			1	1	3	2	1		1	2	5	2	11	7
14			2	1	1	2	1	1	11	3	4	1	19	8
15			1	2	3		2	1	1	2	11	2	18	7
16			1			1	1	2		2	13	4	15	9
17						1		1			5	1	5	3
18														
19														
Total	3		12	7	24	13	20	12	29	15	76	36	164	83

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A37-T03. Number of children with leukocytopenia by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6														
7					1	1							1	1
8						2	3	3					3	5
9				1	6	1	2	2		1			8	5
10			3		4	6	1		1				9	6
11					4	1		1	3	1	1	1	8	4
12			3	1	1	1	1	1	3	1	2		10	4
13					13	2	3	2					16	4
14			2		1		2		1	2	1		7	2
15			1	2	5	1			1	2			7	5
16					1		1		1				3	
17									1	1			1	1
18									1				1	
19														
Total			9	4	36	15	13	9	12	8	4	1	74	37

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A37-T04. Number of children with leukocytopenia by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6		1												1
7					2								2	
8					4	1	2	1					6	2
9			1		1	1	1	1		1	1		4	3
10					7	1	1	1	1			1	9	3
11					12	1	2		1	2	1	1	16	4
12				1	2	1		2	1		1		4	4
13					2	3	2	1	5				9	4
14			1		4	3	2		2	1			9	4
15			1		7	3	1		1		1		11	3
16					3	4		1	2				5	5
17														
18														
19														
Total		1	3	1	44	18	11	7	13	4	4	2	75	33

[a]Diagnosed when leukocyte count $<3.8 \times 10^9/l$ (for boys) or $3.6 \times 10^9/l$ (for girls).

A37-T05. Number of children with leukocytopenia by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6														
7														
8			1		2				1				4	
9		2		1	2	1							2	4
10							3		2				5	
11					1		1	2	1		1	1	4	3
12			1					1	2		1		4	1
13	2		2				2		2		1		9	
14			1				1		1				3	
15					1		2		2		1		6	
16					2		1		2	1			5	1
17														
18														
19														
Total	2	2	5	1	8	1	10	3	13	1	4	1	42	9

[a]Diagnosed when leukocyte count $< 3.8 \times 10^9$/l (for boys) or 3.6×10^9/l (for girls).

A38-T01. Number of children with leukocytosis by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	15	11	1	2	23	24	8	5	14	8			61	50
Mozir City	1				3	1				1			4	2
Dobrushskii R.	15	10	11	8	2	1				1			28	20
Vetkovskii R.					1		1						2	
Gomelskii R.	8	4	16	16	38	18	41	34	35	31	13	11	151	114
Loevskii R.			12	3	3	3			1				16	6
Braginskii R.	16	14											16	14
Checherskii R.				1	1								1	1
Buda-Koshelevskii R.	7	17			1	1			22	17			30	35
Rechitskii R.	2				1	1	24	18	1	1		1	28	21
Hoynikskii R.			4	3		1			18	9			22	13
Narovlyanskii R.														
Kormyanskii R.		1	2	1					1	4			3	6
Rogachevskii R.							5	7					5	7
Zlobinskii R.	2				1	1	15	14					18	15
Svetlogorskii R.					1	2					1	1	2	3
Kalinkovichskii R.		1			2	1			1				3	2
Mozirskii R.								1						1
Elskii R.			9	4				1	2				11	5
Oktyabrskii R.							1						1	
Petrikovskii R.	7	6							1				8	6
Lelchitskii R.		1							4	2			4	3
Zitkovichskii R.										1				1
Total	73	65	55	38	77	54	95	80	100	75	14	13	414	325

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A38-T02. Number of children with leukocytosis by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	1	1	15	12	25	18	20	14	16	19	3	4	80	68
Bobruisk City														
Hotimskii R.					2								2	
Klimovichskii R.	2	1					4		4	3			10	4
Kostyukovichskii R.			5	2		1	2	1					7	4
Mstislavskii R.														
Krichevskii R.	19	16							1				20	16
Cherikovskii R.			9	2	3	3	12	15	1		2	2	27	22
Krasnopolskii R.			1		5	7	32	12	8	8	5	5	51	32
Goretskii R.									1	1			1	1
Chausskii R.	2	7	17	12	10	13	9	4	9	9			47	45
Slavgorodskii R.	11	5									8	6	19	11
Shklovskii R.														
Mogilevskii R.			45	28	3	3	6	4	6	5	4	4	64	44
Bykhovskii R.	13	16			13	10	21	14	11	8			58	48
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.			3	1									3	1
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.					1								1	
Total	48	46	95	57	62	55	106	64	57	53	22	21	390	296

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9/l$ (for boys) or $11.0 \times 10^9/l$ (for girls).

A38-T03. Number of children with leukocytosis by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	22	15	30	25	59	50	27	12	7	9			145	111
Gordeevskii R.							20	37		1			20	38
Klintsovskii R.			6	4	15	15			1	2			22	21
Novozybkovskii R.					36	25	14	17					50	42
Zlynkovskii R.							25	25					25	25
Krasnogorskii R.									15	9	22	11	37	20
Total	22	15	36	29	110	90	86	91	23	21	22	11	299	257

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A38-T04. Number of children with leukocytosis by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					5	4	9	6	2	6	1	3	17	19
Polesskii R.	11	12	26	21									37	33
Ivankovskii R.	20	18	7	6			3	12		1			30	37
Borodyanskii R.	4	5	6	1			56	68	1				67	74
Vishgorodskii R.	6	6	10	11	2	11	16	31					34	59
Irpenskii R.			5	4	10	5	26	27	67	86	26	29	134	151
K. Svyatoshinskii R.					6	12	9	9	29	25	6	15	50	61
Makarovskii R.	7	2	6	8	8	6			1				22	16
Brovarskii R.					11	8	5	7	6	4			22	19
Vasilkovskii R.					16	35							16	35
Fastovskii R.					17	18	2	1					19	19
Zgurovskii R.														
Baryshevskii R.					5	5	2	3	1		1	3	9	11
Borispolskii R.					5	5		2					5	7
Obukhovskii R.					10	7	1		1				12	7
Belotserkovskii R.					4	7	2	4					6	11
Skvirskii R.														
Yagotinskii R.								1						1
P. Khmelnitskii R.														
Kagarlytskii R.					24	28							24	28
Rakitnyanskii R.							28	31		1			28	32
Volodarskii R.									69	58			69	58
Mironovskii R.								2						2
Boguslavskii R.									7	8			7	8
Taraschanskii R.							1						1	
Stavischenskii R.							10	16					10	16
Tetievskii R.							1		13	12			14	12
Total	48	43	60	51	123	151	171	220	197	201	34	50	633	716

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A38-T05. Number of children with leukocytosis by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	13	2	20	21	9	11	28	13	14	13		1	84	61
Ovruchskii R.	5	12	10	10	5	7	1	1	4	2	13	17	38	49
Olevskii R.	2				18	15	9	8	10	17		1	39	41
Narodichskii R.		3	7	6	1		8	5					16	14
Korostenskii R.	3		7	4	6	9	27	29	22	13			65	55
Luginskii R.	2	1	5	4	6	6	10	6	21	13			44	30
Emilchinskii R.	1	4	8	4			14	11	18	19	20	16	61	54
Malinskii R.	2	3	7	11	4	2			18	20	16	8	47	44
V. Volinskii R.	1	1	7	6	54	63	13	9	15	3			90	82
N. Volinskii R.	1	8	10	4	1	2			8	16			20	30
Radomishliskii R.	4	6											4	6
Brusilovskii R.			14	8									14	8
Total	34	40	95	78	104	115	110	82	130	116	49	43	522	474

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A39-T01. Number of children with leukocytosis by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	12	8											12	8
6	7	12	20	4									27	16
7	12	8	8	4	13	5							33	17
8	8	12	7	6	22	16	15	14		1			52	49
9	13	3	5	5	6	8	18	12	18	13	1	1	61	42
10	2	8	5	3	8	8	15	12	19	8	2	2	51	41
11	9	1	1		9	7	18	7	21	11	1	1	59	27
12	3	6	2	1	5	2	13	9	15	15	4	3	42	36
13	3	4	3	5	3		6	12	9	13	1	4	25	38
14	3	1		8	4	2	9	9	9	8	4	1	29	29
15	1	2	3	2	3	1	1	3	9	6	1	1	18	15
16			1		2	2		2					3	4
17					2	3							2	3
18														
19														
Total	73	65	55	38	77	54	95	80	100	75	14	13	414	325

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9/l$ (for boys) or $11.0 \times 10^9/l$ (for girls).

A39-T02. Number of children with leukocytosis by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	10	11	1	1									11	12
6	18	16	13	9									31	25
7	5	7	15	8	15	7	1						36	22
8	4	3	13	5	8	11	10	5	1				36	24
9	6	4	13	4	7	1	25	17	10	5			61	31
10	2	3	8	4	6	5	8	7	8	13	5	3	37	35
11	2		7	4	8	11	15	6	10	5	3	5	45	31
12		2	5	4	5	4	10	8	9	12	4	3	33	33
13			9	6	5	7	11	8	5	7	2	3	32	31
14	1		9	5	4	4	6	5	8	5	2	3	30	22
15			2	5	2	2	10	4	3	5	4	1	21	17
16				2	2	3	8	4	3		1	2	14	11
17							2			1	1	1	3	2
18														
19														
Total	48	46	95	57	62	55	106	64	57	53	22	21	390	296

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9/l$ (for boys) or $11.0 \times 10^9/l$ (for girls).

A39-T03. Number of children with leukocytosis by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	3	5											3	5
6	13	5	2	3									15	8
7	4	3	9	4	13	4	1						27	11
8	1	1	4	3	18	16	12	8					35	28
9	1		3	4	13	8	12	15	7	4			36	31
10			8	2	15	17	9	7	1	4	6	2	39	32
11				2	14	7	6	9	1	1	4	2	25	21
12		1	2		9	4	13	15	1	1	3	3	28	24
13			2	1	7	9	11	10	3	1	2		25	21
14			4	6	12	15	11	7	2	2	5	4	34	34
15			2	4	6	4	6	9	1	5	2		17	22
16					3	6	5	11	3	1			11	18
17									4	2			4	2
18														
19														
Total	22	15	36	29	110	90	86	91	23	21	22	11	299	257

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A39-T04. Number of children with leukocytosis by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	3	1											3	1
6	8	5	3	4		1							11	10
7	11	11	19	12	5	4	2	1					37	28
8	5	6	7	7	30	22	21	30		2			63	67
9	9	6	7	2	17	18	22	24	20	20	2	2	77	72
10	5	7	3	4	13	20	26	19	46	25	11	6	104	81
11	3	5	8	2	20	15	24	24	30	19	5	6	90	71
12	2	1	4		9	18	19	24	28	49	5	8	67	100
13	1		5	7	3	11	18	38	26	30	4	12	57	98
14		1	3	9	9	18	24	25	29	23	2	6	67	82
15	1		1	3	11	11	11	18	9	16	3	7	36	55
16				1	4	9	3	11	8	13	2	2	17	36
17					2	4	1	6	1	3			4	13
18										1		1		2
19														
Total	48	43	60	51	123	151	171	220	197	201	34	50	633	716

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A39-T05. Number of children with leukocytosis by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	5	2	2	1									7	3
6	11	5	10	6	3								24	11
7	6	5	20	6	12	7	4	5					42	23
8	2	2	18	11	15	11	18	10	1	1			54	35
9	1	6	13	9	18	10	17	11	15	10	2	1	66	47
10	3	7	8	9	9	15	16	14	16	9	9	5	61	59
11	2	5	8	5	6	10	9	5	23	17	8	4	56	46
12	1		5	6	5	8	14	9	17	16	9	5	51	44
13	1	4	5	8	6	11	10	9	18	13	5	5	45	50
14	2	4	5	12	7	12	10	7	13	25	6	9	43	69
15			1	4	14	18	6	7	12	9	6	6	39	44
16				1	8	13	6	4	13	13	3	5	30	36
17					1			1	2	3	1	3	4	7
18														
19														
Total	34	40	95	78	104	115	110	82	130	116	49	43	522	474

[a]Diagnosed when leukocyte count $> 10.6 \times 10^9$/l (for boys) or 11.0×10^9/l (for girls).

A40-T01. Number of children with thrombocytopenia by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City					1		1	1		1			2	2
Mozir City														
Dobrushskii R.														
Vetkovskii R.														
Gomelskii R.									1	1			1	1
Loevskii R.				1										1
Braginskii R.	1												1	
Checherskii R.														
Buda-Koshelevskii R.									1				1	
Rechitskii R.								1						1
Hoynikskii R.														
Narovlyanskii R.														
Kormyanskii R.														
Rogachevskii R.														
Zlobinskii R.								1						1
Svetlogorskii R.														
Kalinkovichskii R.														
Mozirskii R.														
Elskii R.														
Oktyabrskii R.														
Petrikovskii R.														
Lelchitskii R.														
Zitkovichskii R.														
Total	1			1	1		1	3	2	2			5	6

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A40-T02. Number of children with thrombocytopenia by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City			1		1	3	2	2	1	1	3	1	8	7
Bobruisk City														
Hotimskii R.														
Klimovichskii R.										1				1
Kostyukovichskii R.				1				1						2
Mstislavskii R.														
Krichevskii R.														
Cherikovskii R.								1				1		2
Krasnopolskii R.					1	1					1		2	1
Goretskii R.														
Chausskii R.						2		1						3
Slavgorodskii R.														
Shklovskii R.														
Mogilevskii R.				1										1
Bykhovskii R.								1						1
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total			1	2	2	6	2	6	1	2	4	2	10	18

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A40-T03. Number of children with thrombocytopenia by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	1			1	1	1				4			2	6
Gordeevskii R.								1		1				2
Klintsovskii R.														
Novozybkovskii R.					7								7	
Zlynkovskii R.														
Krasnogorskii R.										1				1
Total	1			1	8	1		1		6			9	9

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A40-T04. Number of children with thrombocytopenia by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City														
Polesskii R.														
Ivankovskii R.														
Borodyanskii R.							1						1	
Vishgorodskii R.								2						2
Irpenskii R.				1					1	3			1	4
K. Svyatoshinskii R.									2	1			2	1
Makarovskii R.			1			1							1	1
Brovarskii R.						1								1
Vasilkovskii R.														
Fastovskii R.														
Zgurovskii R.														
Baryshevskii R.														
Borispolskii R.														
Obukhovskii R.														
Belotserkovskii R.														
Skvirskii R.														
Yagotinskii R.														
P. Khmelnitskii R.														
Kagarlytskii R.					1								1	
Rakitnyanskii R.							2	2					2	2
Volodarskii R.									1				1	
Mironovskii R.														
Boguslavskii R.														
Taraschanskii R.														
Stavischenskii R.								1						1
Tetievskii R.														
Total			1	1	1	2	3	5	4	4			9	12

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A40-T05. Number of children with thrombocytopenia by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City		1					1	1	1	2			2	4
Ovruchskii R.											1	1	1	1
Olevskii R.							1						1	
Narodichskii R.								1						1
Korostenskii R.							1		1				2	
Luginskii R.						1								1
Emilchinskii R.							1				1		2	
Malinskii R.									1		1	1	2	1
V. Volinskii R.					2		3	3	1	1			6	4
N. Volinskii R.										3				3
Radomishliskii R.														
Brusilovskii R.														
Total		1			2	1	7	5	4	6	3	2	16	15

[a]Diagnosed when platelet count $< 100 \times 10^9/l$.

A41-T01. Number of children with thrombocytopenia by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	1												1	
6				1										1
7														
8														
9					1			1	1				2	1
10								2		1				3
11														
12							1						1	
13									1				1	
14										1				1
15														
16														
17														
18														
19														
Total	1			1	1		1	3	2	2			5	6

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A41-T02. Number of children with thrombocytopenia by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6			1										1	
7														
8														
9						1								1
10				1	1	1	1	1					2	3
11								1						1
12								2	1				1	2
13				1	1	3				1		1	1	6
14							1				1		2	
15						1		2		1		1		5
16											3		3	
17														
18														
19														
Total			1	2	2	6	2	6	1	2	4	2	10	18

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A41-T03. Number of children with thrombocytopenia by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6														
7														
8														
9														
10								1		1				2
11					1	1							1	1
12	1				2					1			3	1
13					1								1	
14				1	2								2	1
15					2					1			2	1
16														
17										1				1
18										2				2
19														
Total	1			1	8	1		1		6			9	9

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A41-T04. Number of children with thrombocytopenia by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6														
7														
8						1								1
9			1										1	
10							2	2	1				3	2
11								1						1
12										1				1
13							1		1				2	
14				1				1	2	1			2	3
15						1		1		2				4
16					1								1	
17														
18														
19														
Total			1	1	1	2	3	5	4	4			9	12

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A41-T05. Number of children with thrombocytopenia by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6		1												1
7														
8														
9										1				1
10							1				1		2	
11							2						2	
12					1		1	3	2	1		1	4	5
13						1	1			1	1		2	2
14							1		1	2		1	2	3
15									1		1		2	
16					1		1	2					2	2
17										1				1
18														
19														
Total		1			2	1	7	5	4	6	3	2	16	15

[a]Diagnosed when platelet count $< 100 \times 10^9$/l.

A42-T01. Number of children with thrombocytosis by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	7	4	3	1	7	6	3	3	3	4		1	23	19
Mozir City		1												1
Dobrushskii R.	5	4	6	1						1			11	6
Vetkovskii R.						1								1
Gomelskii R.	2		9	8	10	11	11	7	8	10	6	3	46	39
Loevskii R.			2	1	1	1		1					3	3
Braginskii R.	5	5											5	5
Checherskii R.				2										2
Buda-Koshelevskii R.	6	4							1	2			7	6
Rechitskii R.		1				1	8	7					8	9
Hoynikskii R.				4					3	1			3	5
Narovlyanskii R.														
Kormyanskii R.			1	2									1	2
Rogachevskii R.			1				1	5					2	5
Zlobinskii R.		1					8	7					8	8
Svetlogorskii R.						1				1				2
Kalinkovichskii R.					1								1	
Mozirskii R.														
Elskii R.			4	2				1					4	3
Oktyabrskii R.														
Petrikovskii R.		1												1
Lelchitskii R.														
Zitkovichskii R.										1				1
Total	25	21	26	21	19	21	31	31	15	20	6	4	122	118

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A42-T02. Number of children with thrombocytosis by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	1	3	8	11	12	10	11	9	3			1	35	34
Bobruisk City					1								1	
Hotimskii R.					1			1					1	1
Klimovichskii R.		1							2	1			2	2
Kostyukovichskii R.			1	1	30	45		1					31	47
Mstislavskii R.														
Krichevskii R.	6	3											6	3
Cherikovskii R.			3	3			3	4					6	7
Krasnopolskii R.							6	5		2			6	7
Goretskii R.										1				1
Chausskii R.	3	5	3	2	8	4	2	2		1			16	14
Slavgorodskii R.	4	4									1		5	4
Shklovskii R.														
Mogilevskii R.			14	6	1		2		2	3	4	1	23	10
Bykhovskii R.	4	9			8	9	3	4	1				16	22
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.														
Kirovskii R.														
Bobruiskii R.														
Osipovichskii R.														
Glusskii R.														
Total	18	25	29	23	61	68	27	26	8	8	5	2	148	152

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A42-T03. Number of children with thrombocytosis by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	5	7	10	6	35	25	4	3	6	6		1	60	48
Gordeevskii R.							3	3		2			3	5
Klintsovskii R.					2	9				1			2	10
Novozybkovskii R.					9	12	6	1					15	13
Zlynkovskii R.							15	7					15	7
Krasnogorskii R.									7	2	5	2	12	4
Total	5	7	10	6	46	46	28	14	13	11	5	3	107	87

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A42-T04. Number of children with thrombocytosis by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City					5	6	3	2					8	8
Polesskii R.	4	2	6	8									10	10
Ivankovskii R.	6	3	2	1			3	3					11	7
Borodyanskii R.	4	5	3	2			10	4					17	11
Vishgorodskii R.	5	4	2	3	8	15	6	4					21	26
Irpenskii R.			2		2	6	5	2	6	12	2	4	17	24
K. Svyatoshinskii R.					5	8	4	4	4		3	2	16	14
Makarovskii R.	6	1	4	1	2	2				1			12	5
Brovarskii R.					10	8	2	4	1				13	12
Vasilkovskii R.					9	9							9	9
Fastovskii R.								2						2
Zgurovskii R.														
Baryshevskii R.					1	3	1					1	2	4
Borispolskii R.					5	2		2					5	4
Obukhovskii R.					18	24		1					18	25
Belotserkovskii R.					3	1		1					3	2
Skvirskii R.							1						1	
Yagotinskii R.								1						1
P. Khmelnitskii R.														
Kagarlytskii R.					5	6							5	6
Rakitnyanskii R.							7	3					7	3
Volodarskii R.									8	7			8	7
Mironovskii R.								1						1
Boguslavskii R.									3	1			3	1
Taraschanskii R.														
Stavischenskii R.							3	4					3	4
Tetievskii R.										1				1
Total	25	15	19	15	73	90	45	38	22	22	5	7	189	187

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A42-T05. Number of children with thrombocytosis by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	2	4	6	4	4	6	14	10	5	4			31	28
Ovruchskii R.	2	2	1	1	2	1		1	1		6	9	12	14
Olevskii R.					3	4	1	1	2	4			6	9
Narodichskii R.		1		1			2	3					2	5
Korostenskii R.	1		1		5	3	8	14	2	7			17	24
Luginskii R.			3	3	1		1	1	3	2			8	6
Emilchinskii R.	1	1	2	1			2	2	4	4	7	4	16	12
Malinskii R.		2	9		1	2			1	8	2	4	13	16
V. Volinskii R.	1		1	5	10	13	2	7	4	3			18	28
N. Volinskii R.			1	2	1	1			2	6			4	9
Radomishliskii R.	1												1	
Brusilovskii R.			1	6									1	6
Total	8	10	25	23	27	30	30	39	24	38	15	17	129	157

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A43-T01. Number of children with thrombocytosis by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	6	1											6	1
6	7	7	6	4									13	11
7	6		6	3	4	4		1					16	8
8	3	7	3	6	9	4	4	3					19	20
9	2	4	5	3	3	5	7	5	3	2	1	1	21	20
10	1	1	2	2	1	3	3	4	4	4	1		12	14
11		1	4	1	2	1	4	6	3	6		1	13	16
12						2	3	7	1	4	1	1	5	14
13						1	5	2	2	2	2		9	5
14				1		1	3	1	2	1	1		6	4
15				1			2	1		1			2	3
16								1				1		2
17														
18														
19														
Total	25	21	26	21	19	21	31	31	15	20	6	4	122	118

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A43-T02. Number of children with thrombocytosis by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	6	8		1									6	9
6	6	11	6	4									12	15
7	6	3	4	5	9	6	1						20	14
8		1	4	2	7	4	8	2					19	9
9		2	2	2	4	2	9	7		2			15	15
10			4	3	5	7	2	7	1	1	2		14	18
11			2	2	13	21	5	1	2	2			22	26
12			3	3	3	10	1	4	2	2		1	9	20
13			3		9	10	1	3	1		1	1	15	14
14			1		7	4		1	1	1	2		11	6
15				1	3	1			1				4	2
16					1	3		1					1	4
17														
18														
19														
Total	18	25	29	23	61	68	27	26	8	8	5	2	148	152

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A43-T03. Number of children with thrombocytosis by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	2	3											2	3
6	2	2	2	1									4	3
7	1	2	2		10	10	1						14	12
8			3	1	10	14	3	1					16	16
9				1	7	7	3	1	4				14	9
10				1	3	7	5	1	3	4	1	1	12	14
11					5	2	3	2	1	1	1	1	10	6
12					2	2	5	5			2		9	7
13			3		3	1	5	1	2	1	1		14	3
14					6		2		1	1		1	9	2
15				2		1	1	3					1	6
16						2								2
17														
18									2	4			2	4
19														
Total	5	7	10	6	46	46	28	14	13	11	5	3	107	87

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A43-T04. Number of children with thrombocytosis by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	2	1											2	1
6	4	2	1										5	2
7	7	3	5	3	6	3							18	9
8	6	1	4	2	4	8	10	7		1			24	19
9	2	3	6	4	6	9	9	6	3	4			26	26
10	3	2	2	1	8	7	9	5	6	2	3	1	31	18
11	1	2			4	10	3	6	3	4	1	2	12	24
12			1	1	5	13	2	5	1	4		2	9	25
13				2	9	7	7	4	5	2	1		22	15
14				2	8	10	1	2	3	2		1	12	17
15		1			18	14	2	3		1			20	19
16					5	8	1		1	1		1	7	10
17						1	1			1			1	2
18														
19														
Total	25	15	19	15	73	90	45	38	22	22	5	7	189	187

[a]Diagnosed when platelet count $> 440 \times 10^9/l$.

A43-T05. Number of children with thrombocytosis by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6	2	1		4	2	1							4	6
7	2	1	7	3	4	4		3					13	11
8			8	6	5	4	9	7	2				24	17
9		1	4	5	4	6	5	5	5	8			18	25
10	4	3	2		3	3	5	5	6	9	4	4	24	24
11		3	3		6	5	2	2	2	5	2	3	15	18
12				2	1	2	2	3	5	4	3		11	11
13		1	1	2	1	3	3	3	1	7	1	4	7	20
14				1	1		1	4	2	1		2	4	8
15						2	2	1	1	3	5	1	8	7
16								6				1		7
17							1			1		2	1	3
18														
19														
Total	8	10	25	23	27	30	30	39	24	38	15	17	129	157

[a]Diagnosed when platelet count $> 440 \times 10^9$/l.

A44-T01. Number of children with low mean corpuscular volume by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City	16	3	10	2	218	146	106	72	61	30	23	16	434	269
Mozir City			1		9	5	1		3	3	4	2	18	10
Dobrushskii R.	13	7	25	14	10	5	1	1	2	1			51	28
Vetkovskii R.		1			10	5	5	5	1	2	2		18	13
Gomelskii R.	3	1	24	13	250	148	101	46	42	22	38	15	458	245
Loevskii R.			11	4	14	12	5	5	3	4			33	25
Braginskii R.	18	10			8	4	1	2					27	16
Checherskii R.			2		3		1	1	1				7	1
Buda-Koshelevskii R.	5	4	1	1	9	7	2	4	13	5	3	1	33	22
Rechitskii R.		1	1		7	6	151	69	5	7	13	4	177	87
Hoynikskii R.			8	3	2	1	2		22	4	1		35	8
Narovlyanskii R.									1				1	
Kormyanskii R.		1	3	4		1		2	4	3		1	7	12
Rogachevskii R.			2	1	2	3	48	35	2	1			54	40
Zlobinskii R.	1				1	5	16	7					18	12
Svetlogorskii R.			1		4	3	1	1	1	1			7	5
Kalinkovichskii R.					3	3			8	1			11	4
Mozirskii R.						1						1		2
Elskii R.			5	6	1	2	1	1	3	3	1	1	11	13
Oktyabrskii R.	1					1	4	2	1	2			6	5
Petrikovskii R.	7	8			1	2	3	3	2			1	13	14
Lelchitskii R.	1	3			2	4	1	2	1	2		1	5	12
Zitkovichskii R.														
Total	65	39	94	48	554	364	450	258	176	91	85	43	1424	843

[a]Diagnosed when mean corpuscular volume < 80 fl.

A44-T02. Number of children with low mean corpuscular volume by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	10	6	61	18	110	43	185	85	124	49	41	13	531	214
Bobruisk City					1								1	
Hotimskii R.					2		7	1					9	1
Klimovichskii R.	1						12	1	13	8			26	9
Kostyukovichskii R.			4	1	2	2	5	1	1				12	4
Mstislavskii R.														
Krichevskii R.	7	7							2	1			9	8
Cherikovskii R.			4	3	2	3	20	12		1	3		29	19
Krasnopolskii R.			5	1	7	2	34	10	35	18	10	3	91	34
Goretskii R.									2				2	
Chausskii R.	8	3	6	3	34	11	34	12	12	11			94	40
Slavgorodskii R.	8	3					1		3	2	5	3	17	8
Shklovskii R.														
Mogilevskii R.			35	18	5	3	13	5	13	6	21	11	87	43
Bykhovskii R.	9	2			21	4	34	28	21	6	3	2	88	41
Kruglianskii R.														
Belynichskii R.														
Klichevskii R.			1										1	
Kirovskii R.									1				1	
Bobruiskii R.					1	1							1	1
Osipovichskii R.														
Glusskii R.					3								3	
Total	43	21	116	44	188	69	345	155	227	102	83	32	1002	423

[a]Diagnosed when mean corpuscular volume < 80 fl.

A44-T03. Number of children with low mean corpuscular volume by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	35	13	43	28	161	52	127	75	34	24		1	400	193
Gordeevskii R.							203	132	5	2			208	134
Klintsovskii R.			6	4	30	11			18	2			54	17
Novozybkovskii R.					49	19	64	30					113	49
Zlynkovskii R.							111	58					111	58
Krasnogorskii R.									66	49	39	17	105	66
Total	35	13	49	32	240	82	505	295	123	77	39	18	991	517

[a]Diagnosed when mean corpuscular volume < 80 fl.

A44-T04. Number of children with low mean corpuscular volume by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City			1		1	2	22	15	17	6	15	5	56	28
Polesskii R.	4	1	12	5									16	6
Ivankovskii R.	14	5	1	2			5	2		1			20	10
Borodyanskii R.	4	3	9	2			127	57					140	62
Vishgorodskii R.	2	3	5	3	6	1	168	88		1			181	96
Irpenskii R.			6	2	8	4	103	46	274	118	193	95	584	265
K. Svyatoshinskii R.					2	2	27	15	116	54	83	57	228	128
Makarovskii R.	13	3	5	2	4	6			1	1			23	12
Brovarskii R.					5	6	77	46	20	10	1		103	62
Vasilkovskii R.					2	1							2	1
Fastovskii R.					1	4						1	1	5
Zgurovskii R.														
Baryshevskii R.					1						2		3	
Borispolskii R.						1			7	2			7	3
Obukhovskii R.					6	2							6	2
Belotserkovskii R.					7	7		1		1			7	9
Skvirskii R.														
Yagotinskii R.												1		1
P. Khmelnitskii R.							1	1					1	1
Kagarlytskii R.					3	5						1	3	6
Rakitnyanskii R.							12	7	1				13	7
Volodarskii R.									32	12			32	12
Mironovskii R.							1						1	
Boguslavskii R.								1	7	11			7	12
Taraschanskii R.														
Stavischenskii R.							4	3					4	3
Tetievskii R.									12	9	1		13	9
Total	37	15	39	16	46	41	547	282	487	226	295	160	1451	740

[a]Diagnosed when mean corpuscular volume < 80 fl.

A44-T05. Number of children with low mean corpuscular volume by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	3	5	7	6	26	12	18	27	78	24	2	2	134	76
Ovruchskii R.	2				12	6			4	1	81	57	99	64
Olevskii R.	1	1			8	5	22	13	18	7			49	26
Narodichskii R.		2	1		1	1	6	3					8	6
Korostenskii R.	3	2	3	3	3	2	25	15	26	9			60	31
Luginskii R.	3		6	1	4	6	8	3	23	8			44	18
Emilchinskii R.	4	2	6	2			27	8	44	18	22	8	103	38
Malinskii R.	2	2	6	2	8	2			53	25	44	18	113	49
V. Volinskii R.			8	2	18	12	10	2	47	21			83	37
N. Volinskii R.	3	4	9	6	6	2			11	10			29	22
Radomishliskii R.														
Brusilovskii R.			6	2									6	2
Total	21	18	52	24	86	48	116	71	304	123	149	85	728	369

[a]Diagnosed when mean corpuscular volume < 80 fl.

A45-T01. Number of children with low mean corpuscular volume by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	10	5											10	5
6	12	6	19	11	2	3							33	20
7	12	6	19	11	94	59	9	5					134	81
8	8	9	13	6	123	82	83	70	2	1			229	168
9	5	6	8	4	105	61	94	48	20	30	3	2	235	151
10	5	1	11	3	81	57	94	56	40	25	31	9	262	151
11	5	3	9	10	49	43	75	22	38	17	23	9	199	104
12	4		3	1	33	22	48	26	33	8	9	7	130	64
13	3		4	1	34	18	37	16	23	3	8	7	109	45
14	1	2	7	1	16	8	7	10	16	4	10	7	57	32
15		1	1		14	6	3	4	4	3	1	1	23	15
16					2	3		1				1	2	5
17					1	2							1	2
18														
19														
Total	65	39	94	48	554	364	450	258	176	91	85	43	1424	843

[a]Diagnosed when mean corpuscular volume < 80 fl.

A45-T02. Number of children with low mean corpuscular volume by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	9	5	6	1									15	6
6	10	8	21	6	4	1							35	15
7	14	3	19	7	50	12	1						84	22
8	4	1	24	4	37	15	58	30	2	2			125	52
9	5	2	9	8	27	7	85	47	40	27	6	2	172	93
10	1	2	6	2	19	9	76	36	53	28	25	13	180	90
11			13	3	23	9	44	19	50	15	16	7	146	53
12			6	6	9	4	32	15	42	11	11	7	100	43
13			9	1	12	6	19	1	21	10	7	1	68	19
14			2	3	4	3	19	1	15	5	10	1	50	13
15			1	2	3	2	8	4	3	3	4	1	19	12
16				1		1	3	2	1	1	4		8	5
17														
18														
19														
Total	43	21	116	44	188	69	345	155	227	102	83	32	1002	423

[a]Diagnosed when mean corpuscular volume < 80 fl.

A45-T03. Number of children with low mean corpuscular volume by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	13	3											13	3
6	16	5	3	6		2							19	13
7	4	3	8	3	36	10	7	2					55	18
8	1	1	7	3	41	16	87	54	1	1			137	75
9			8	3	47	17	94	60	25	29		2	174	111
10			10	5	40	13	66	61	24	10	11	6	151	95
11	1		5	3	24	8	80	43	23	8	5	2	138	64
12				1	17	4	64	28	17	6	6	4	104	43
13			2	1	15	7	46	18	13	7	7	2	83	35
14		1	5	2	16	3	46	13	14	6	7	2	88	27
15			1	4	4	1	13	10	5	4	3		26	19
16				1		1	2	6		1			2	9
17									1	5			1	5
18														
19														
Total	35	13	49	32	240	82	505	295	123	77	39	18	991	517

[a]Diagnosed when mean corpuscular volume < 80 fl.

A45-T04. Number of children with low mean corpuscular volume by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	1	1											1	1
6	10	4	2	1									12	5
7	4	2	12	6	10	6	12	5					38	19
8	10	2	5	3	10	11	108	67	4	8			137	91
9	8	3	8		5	5	99	67	72	36	9	8	201	119
10	1	2	2	1	6		99	43	106	46	64	43	278	135
11	1		3	2	5		76	34	97	43	78	46	260	125
12	1	1	1		3	3	58	21	89	33	73	26	225	84
13			4	2	3	2	38	16	63	19	37	15	145	54
14	1		1	1	3	1	45	13	41	21	29	12	120	48
15			1			4	9	9	7	4	4	7	21	24
16					1	7	3	4	7	13	1	2	12	26
17						2		3	1	3		1	1	9
18														
19														
Total	37	15	39	16	46	41	547	282	487	226	295	160	1451	740

[a]Diagnosed when mean corpuscular volume < 80 fl.

A45-T05. Number of children with low mean corpuscular volume by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5		1												1
6	2	3	7	3	4								13	6
7	3	3	7	6	15	4	12	2					37	15
8	3	2	14	1	20	11	20	7	3	1			60	22
9	5	3	7	4	9	6	17	9	52	26	2	2	92	50
10	3	4	3	5	12	2	23	7	56	29	37	21	134	68
11	4		4	1	8	3	9	9	53	18	25	20	103	51
12		1	3	2	4	5	14	8	55	19	28	13	104	48
13	1		5	1	3	4	8	5	36	9	22	12	75	31
14		1	2		6	4	7	6	31	5	19	6	65	22
15				1	4	6	4	8	11	9	12	8	31	32
16					1	3	2	9	6	6	4	2	13	20
17								1	1	1		1	1	3
18														
19														
Total	21	18	52	24	86	48	116	71	304	123	149	85	728	369

[a]Diagnosed when mean corpuscular volume < 80 fl.

A46-T01. Number of children with eosinophilia by place of residence and year of examination. Gomel region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Gomel City			7	4	57	69	32	38	29	39	6	3	131	153
Mozir City				1	2	1			3	1			5	3
Dobrushskii R.			67	62	2	2		4	1	5			70	73
Vetkovskii R.					2	2	2	1					4	3
Gomelskii R.			40	22	123	124	119	138	59	73	48	45	389	402
Loevskii R.			3	2	5	9	1	2	5	2			14	15
Braginskii R.					2	1		1					2	2
Checherskii R.					1			1	2	1			3	2
Buda-Koshelevskii R.					5	7	1	1	39	42			45	50
Rechitskii R.						2	96	68	3		2	5	101	75
Hoynikskii R.			27	12		1	1	2	33	27			61	42
Narovlyanskii R.														
Kormyanskii R.			7	6			1	2	7	12			15	20
Rogachevskii R.					1	1	23	27	1	3			25	31
Zlobinskii R.				1	1	6	27	40		1			28	48
Svetlogorskii R.					1	2			1	1			2	3
Kalinkovichskii R.				1	2	1			4	4			6	6
Mozirskii R.					2	1		2		1			2	4
Elskii R.			21	32						1	1		22	33
Oktyabrskii R.							3		2	2			5	2
Petrikovskii R.							1		2	1			3	1
Lelchitskii R.					1	4	1		7	7			9	11
Zitkovichskii R.									2				2	
Total			172	143	207	233	308	327	200	223	57	53	944	979

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9$/l.
Note: Analysis of hemograms was started in mid-1992 in Gomel region.

A46-T02. Number of children with eosinophilia by place of residence and year of examination. Mogilev region, Belarus.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Mogilev City	9	12	107	77	162	153	138	131	109	118	85	70	610	561
Bobruisk City										1				1
Hotimskii R.					5	2	5	1					10	3
Klimovichskii R.	18	10					27	14	16	16			61	40
Kostyukovichskii R.			35	32	1	3	9	7		1			45	43
Mstislavskii R.														
Krichevskii R.	53	44				1				1			53	46
Cherikovskii R.			30	28	7	4	46	51	3	3	17	19	103	105
Krasnopolskii R.			9	9	16	16	68	47	43	32	44	54	180	158
Goretskii R.				1						4				5
Chausskii R.	27	26	79	89	43	47	19	11	9	5			177	178
Slavgorodskii R.	51	35					1	3		2	19	30	71	70
Shklovskii R.										1				1
Mogilevskii R.			176	144	5	13	24	17	25	18	47	39	277	231
Bykhovskii R.	28	33	1		27	35	33	42	26	16	1	3	116	129
Kruglianskii R.														
Belynichskii R.							1						1	
Klichevskii R.			14	12									14	12
Kirovskii R.														
Bobruiskii R.						3								3
Osipovichskii R.														
Glusskii R.					2	1	1						3	1
Total	186	160	451	392	268	278	372	324	231	218	213	215	1721	1587

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9$/l.

A46-T03. Number of children with eosinophilia by place of residence and year of examination. Bryansk region, Russian Federation.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Klincy City	113	88	259	265	663	595	132	107	63	67	2	8	1232	1130
Gordeevskii R.							110	112	3	7			113	119
Klintsovskii R.	1		39	29	73	72		1	8	6		1	121	109
Novozybkovskii R.					190	180	55	66					245	246
Zlynkovskii R.							107	124					107	124
Krasnogorskii R.									56	69	48	57	104	126
Total	114	88	298	294	926	847	404	410	130	149	50	66	1922	1854

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9$/l.

A46-T04. Number of children with eosinophilia by place of residence and year of examination. Kiev region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Kiev City		1	3	2	14	15	15	18	5	6	4	2	41	44
Polesskii R.	17	15	88	63		1							105	79
Ivankovskii R.	52	63	24	35	1		26	27		1		1	103	127
Borodyanskii R.	23	31	15	25			131	115				2	169	173
Vishgorodskii R.	26	22	27	30	21	23	111	112		2			185	189
Irpenskii R.			19	29	35	39	46	57	130	135	36	43	266	303
K. Svyatoshinskii R.				2	32	37	4	3	24	28	11	21	71	91
Makarovskii R.	29	28	60	67	19	32			1	1			109	128
Brovarskii R.					66	83	21	29	2	9			89	121
Vasilkovskii R.					52	32		2					52	34
Fastovskii R.					30	50	3	2		1		1	33	54
Zgurovskii R.						1								1
Baryshevskii R.					16	16	4	4			8	5	28	25
Borispolskii R.					19	11		4	3	4			22	19
Obukhovskii R.					21	26	3	2					24	28
Belotserkovskii R.					11	22	1	1	1				13	23
Skvirskii R.							1			1			1	1
Yagotinskii R.								1						1
P. Khmelnitskii R.														
Kagarlytskii R.				1	67	73							67	74
Rakitnyanskii R.							66	75					66	75
Volodarskii R.									146	170			146	170
Mironovskii R.					1		2	1					3	1
Boguslavskii R.									14	16			14	16
Taraschanskii R.						1	1		1				2	1
Stavischenskii R.							52	51					52	51
Tetievskii R.									54	47			54	47
Total	147	160	236	254	405	462	487	504	381	421	59	75	1715	1876

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9$/l.

A46-T05. Number of children with eosinophilia by place of residence and year of examination. Zhitomir region, Ukraine.[a]

Place of residence	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Korosten City	25	25	93	102	84	117	118	176	59	61		4	379	485
Ovruchskii R.	27	39	24	28	39	47	2	3	5	10	37	50	134	177
Olevskii R.	14	13	2		70	91	46	45	102	107			234	256
Narodichskii R.	3	9	23	34	4	7	31	42					61	92
Korostenskii R.	9	10	47	48	32	58	117	131	43	54			248	301
Luginskii R.	20	15	36	44	49	57	57	54	16	11			178	181
Emilchinskii R.	14	21	39	29		1	74	78	37	45	26	35	190	209
Malinskii R.	16	19	76	85	48	35			50	55	30	35	220	229
V. Volinskii R.	1	2	48	35	146	147	58	80	47	43			300	307
N. Volinskii R.	13	31	61	56	16	20			95	106			185	213
Radomishliskii R.	9	12											9	12
Brusilovskii R.			42	36									42	36
Total	151	196	491	497	488	580	503	609	454	492	93	124	2180	2498

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9$/l.

A47-T01. Number of children with eosinophilia by age at the time of examination and year of examination. Gomel region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5														
6			19	17									19	17
7			31	20	30	23	1	1					62	44
8			33	22	40	41	44	44	1	4			118	111
9			24	25	52	35	67	52	40	32	4	4	187	148
10			22	12	26	37	55	62	39	46	10	9	152	166
11			12	14	19	23	57	50	41	33	13	7	142	127
12			11	8	11	32	36	47	30	36	10	9	98	132
13			11	12	8	14	25	33	18	41	7	4	69	104
14			5	8	13	19	17	31	22	20	8	15	65	93
15			3	5	7	3	3	7	7	9	4	5	24	29
16			1			3	2		1	2	1		5	5
17					1	3	1		1				3	3
18														
19														
Total			172	143	207	233	308	327	200	223	57	53	944	979

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9/l$.

Note: Analysis of hemograms was started in mid-1992 in the Gomel region.

A47-T02. Number of children with eosinophilia by age at the time of examination and year of examination. Mogilev region, Belarus.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	35	22	4										39	22
6	37	41	60	43	2								99	84
7	29	25	57	38	47	26	1	2					134	91
8	32	28	58	38	31	29	47	37	3	1			171	133
9	23	11	45	43	21	30	76	60	24	26	5	2	194	172
10	11	15	59	50	38	36	77	51	47	42	26	34	258	228
11	7	10	42	57	34	45	53	52	44	42	25	26	205	232
12	3	6	51	52	35	35	38	39	51	36	28	27	206	195
13	7	1	41	29	26	26	28	37	27	27	22	22	151	142
14	2	1	24	27	14	25	29	28	17	20	39	30	125	131
15			8	11	13	13	12	10	10	15	40	41	83	90
16			2	4	7	13	11	8	8	7	20	20	48	52
17										1	7	13	7	14
18											1		1	
19										1				1
Total	186	160	451	392	268	278	372	324	231	218	213	215	1721	1587

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9/l$.

A47-T03. Number of children with eosinophilia by age at the time of examination and year of examination. Bryansk region, Russian Federation.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	34	27											34	27
6	44	33	18	14	7	4							69	51
7	22	16	31	24	98	69	3	6					154	115
8	5	3	40	30	132	118	67	64	5				249	215
9	3	3	38	39	155	112	62	69	30	20	1	2	289	245
10	3	3	37	41	116	128	56	59	14	18	10	17	236	266
11	3		20	25	114	112	62	52	15	17	10	13	224	219
12		3	21	20	110	110	56	51	15	19	10	15	212	218
13			26	19	94	85	37	34	20	25	12	9	189	172
14			36	40	64	78	26	30	11	12	5	7	142	167
15			30	42	27	27	25	22	7	13	2	3	91	107
16			1		9	4	5	21	5	5			20	30
17							5	2	2	10			7	12
18									5	9			5	9
19									1	1			1	1
Total	114	88	298	294	926	847	404	410	130	149	50	66	1922	1854

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9$/l.

A47-T04. Number of children with eosinophilia by age at the time of examination and year of examination. Kiev region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	6	6											6	6
6	28	27	11	9		1							39	37
7	27	21	44	49	23	21	4	3					98	94
8	22	22	45	40	63	63	68	54	2	3			200	182
9	20	37	31	30	59	66	78	73	59	46	2	6	249	258
10	18	26	28	36	48	80	93	74	77	95	20	7	284	318
11	13	12	26	17	61	47	67	74	62	73	12	24	241	247
12	4	2	14	24	36	48	52	66	69	76	11	10	186	226
13	6	3	9	26	41	43	54	65	43	53	6	8	159	198
14	2	3	19	14	29	44	35	46	43	34	4	6	132	147
15	1	1	6	7	30	30	24	30	13	23	3	11	77	102
16			3	2	10	13	11	17	10	15	1	2	35	49
17					5	6	1	2	2	2		1	8	11
18									1	1			1	1
19														
Total	147	160	236	254	405	462	487	504	381	421	59	75	1715	1876

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9/l$.

A47-T05. Number of children with eosinophilia by age at the time of examination and year of examination. Zhitomir region, Ukraine.[a]

Age at the time of examination (years)	Year of examination												Total	
	1991		1992		1993		1994		1995		1996			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5	11	11	3	5									14	16
6	18	20	35	28	14	10							67	58
7	12	12	57	56	51	32	20	25					140	125
8	27	21	83	79	76	80	68	63	4	3			258	246
9	24	26	80	69	78	75	97	79	67	75	1	3	347	327
10	23	42	64	68	60	80	74	77	83	87	15	15	319	369
11	13	23	56	49	45	65	62	90	72	80	27	21	275	328
12	11	16	33	46	44	48	68	83	73	82	14	19	243	294
13	8	10	37	35	35	60	45	73	57	67	7	20	189	265
14	4	11	26	42	36	52	35	59	39	46	11	21	151	231
15		4	9	13	21	43	18	36	41	30	14	15	103	141
16			8	7	24	32	15	22	16	18	2	9	65	88
17					4	3	1	2	2	4	2	1	9	10
18														
19														
Total	151	196	491	497	488	580	503	609	454	492	93	124	2180	2498

[a]Diagnosed when eosinophil count $> 0.5 \times 10^9/l$.

A48–T01. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Boys. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Gomel City	18 (4)[a]	24 (1)	27 (1)	39 (2)	30	24	26 (1)	25	14	6	1
	18–64[b]	23–54	23–265	20–91	20–93	14–60	17–132	17–94	16–45	33–52	28
	29,36,44[c]	29,35,40	29,37,54	30,37,46	30,42,51	28,36,53	28,33,40	31,37,49	25,28,33	43,45,50	
Mozir City	1			2		2	2	1			
	132			33–40		18–31	36–54	13			
Dobrushskii R.	23 (1)	39 (2)	27 (2)	33	44 (1)	19	10	7	4	2	
	25–76	31–105	26–212	25–105	18–163	35–89	44–252	17–67	27–51	63–836	
	40,46,54	36,42,51	41,55,62	49,54,69	40,49,61	40,53,67	55,68,80	38,59,67	30,39,48		
Vetkovskii R.											
Gomelskii R.	3	2 (2)	7 (1)	9 (1)	4	2	7	4	8	6	
	39–165	37–42	34–91	26–57	26–155	38–50	15–94	38–138	20–241	34–234	
	39,82,165		39,44,62	27,35,40	30,36,96		36,45,54	44,54,98	23,35,46	39,83,129	
Loevskii R.						1	1				
						30	53				
Braginskii R.	10	25	26	30	23	22 (1)	29	39	23	34	9
	57–234	39–233	60–265	110–422	88–289	53–195	84–355	23–423	12–318	62–393	88–291
	123,166,211	128,138,171	124,160,178	155,185,223	149,170,195	98,139,170	143,186,223	123,157,197	91,151,214	146,169,199	144,181,228
Checherskii R.											
Buda-	6	12	16 (1)	11	15	8	15	10	15	10	7
Koshelevskii R.	33–57	25–114	30–566	34–172	36–345	32–78	24–89	20–127	18–135	37–176	43–153
	36,43,51	41,58,71	43,49,80	38,48,60	41,50,80	34,41,51	39,53,76	42,49,84	39,57,67	46,60,104	61,97,121
Rechitskii R.	(1)	2 (1)	1	1	1				1		
		37–52	18	30	33				31		
Hoynikskii R.											
Narovlyanskii R.			1			1					
			68			46					

(cont.)

A48–T01. Continued.

Place of residence	Age (years) at the time of examination									
	5	6	7	8	9	10	11	12	13	14	15
Kormyanskii R.			1		1	1					
			51		70	80					
Rogachevskii R.											
Zlobinskii R.			1	1 (2)	1		3	1	3	1	
			40	30	30		29–62	47	35–55	36	
							29,40,62		35,47,55		
Svetlogorskii R.	1			1							
	36			18							
Kalinkovichskii R.							2	1	1		
							23–39	36	31		
Mozirskii R.						1					
						41					
Elskii R.											
Oktyabrskii R.		1		1							
		106		40							
Petrikovskii R.	6 (1)	8	7	3 (1)	7	8	1	1	4	2	
	25–82	26–104	24–68	26–84	38–312	31–157	21	29	51–113	21–125	
	31,34,55	32,48,79	28,53,57	26,55,84	40,60,123	45,61,81			62,78,98		
Lelchitskii R.	4	4 (1)	3	1	1	3	3	1			
	46–163	39–68	194–470	185	544	116–258	55–143	54			
	50,95,150	46,54,61	194,215,470			116,136,258	55,70,143				
Zitkovichskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T02. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Girls. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Gomel City	15 (3)[a]	19 (3)	25 (3)	29 (2)	35 (1)	40 (2)	33 (2)	26	24	15	1
	26–55[b]	7–51	7–70	15–76	18–56	15–108	13–91	19–183	19–84	18–58	37
	35,38,45[c]	31,36,39	32,38,48	28,33,44	31,36,48	26,33,46	24,32,39	30,38,50	24,33,42	24,30,36	
Mozir City				2	1	1		1		1	
				32–163	30	29		23		43	
Dobrushskii R.	29 (1)	40 (1)	33 (1)	40	31	26 (1)	14 (1)	12	8	6	
	27–97	13–354	25–111	22–89	13–150	20–214	14–88	40–187	35–230	44–82	
	39,46,61	35,49,62	36,45,57	42,52,62	43,53,62	40,54,63	49,54,59	49,57,81	39,52,63	45,55,66	
Vetkovskii R.				1	1			1			1
				40	42			41			79
Gomelskii R.	3	5	2	6	4	6	5	5	2	1	1
	32–43	25–106	25–29	20–50	25–46	30–80	31–296	27–50	28–42	42	44
	32,33,43	29,50,51		31,38,49	32,40,43	31,35,47	31,46,66	41,42,46			
Loevskii R.						2	1				
						27–60	289				
Braginskii R.	11	15	29	30	28	31	22	24	17	30	5
	47–221	98–302	58–275	106–374	47–236	30–422	25–260	22–256	30–219	52–243	70–278
	106,128,158	135,150,219	117,158,187	140,170,189	125,158,184	93,148,177	108,136,178	102,130,150	101,141,195	100,128,155	136,152,225
Checherskii R.											
Buda-	3	14 (1)	17	17	17	10	13	17	16	20	8
Koshelevskii R.	36–54	33–127	37–167	32–100	16–396	26–80	36–107	25–109	26–115	20–77	10–249
	36,47,54	44,62,88	46,62,105	44,60,75	40,47,51	41,49,68	39,49,55	37,52,61	33,37,58	35,47,57	40,52,81
Rechitskii R.	1	2	1		1		1	1	1	1	
	30	31–83	49		35		40	57	14	30	
Hoynikskii R.					1	1				1	
					100	47				49	
Narovlyanskii R.				1							
				34							

(cont.)

A48-T02. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Kormyanskii R.	(1)										
Rogachevskii R.			1		1			1	(1)		
			23		22			30			
Zlobinskii R.					1	1	1		1	2	1
					31	44	35		30	31–42	41
Svetlogorskii R.									1		
									25		
Kalinkovichskii R.	1					(1)		1	1		
	27							56	31		
Mozirskii R.						1					
						44					
Elskii R.											
Oktyabrskii R.											
Petrikovskii R.	14	13 (1)	13	8	8	5	11	8	6	8	1
	30–105	33–80	24–77	27–96	40–81	21–97	22–116	37–203	29–111	15–98	29
	36,46,55	39,48,65	36,40,56	44,60,83	44,61,66	34,45,78	37,55,66	47,52,73	69,83,94	31,46,59	
Lelchitskii R.	4 (1)	7		5	3	3	5		3		1
	38–420	31–104		30–185	122–193	28–116	59–215		70–136		84
	50,161,340	34,72,80		61,62,68	122,163,193	28,74,116	93,180,188		70,124,136		
Zitkovichskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T03. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Boys. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Gomel City		1 (1) 41	4 (1)[a] 27–82[b] 31,48,72[c]	4 (1) 21–37 21,26,33	5 (1) 24–34 30,30,30	9 19–77 25,27,29	7 20–39 26,29,35	11 20–113 24,29,34	4 24–27 25,26,27	4 11–96 18,32,69	1 23	
Mozir City				1 26	(1)		1 22		2 38–48			
Dobrushskii R.		18 (10) 23–186 30,50,67	33 (14) 20–603 30,44,71	33 (12) 18–282 27,32,65	23 (6) 19–156 26,38,56	36 12–237 25,31,69	23 (2) 20–272 29,43,102	43 16–253 24,40,77	35 (1) 14–232 23,41,64	15 9–216 27,30,58	5 18–207 28,38,43	
Vetkovskii R.												
Gomelskii R.	(1)	39 (7) 20–89 30,39,50	50 (15) 20–98 29,32,41	51 (16) 16–1011 25,31,45	49 (6) 18–115 25,34,45	65 (6) 17–188 27,33,41	71 (3) 14–70 22,27,37	64 (3) 12–167 23,29,38	45 (2) 18–152 24,29,44	57 15–84 23,29,39	31 9–170 24,32,53	
Loevskii R.	3 (1) 25–29 25,29,29	35 (22) 22–96 27,32,42	25 (5) 23–138 29,35,47	32 (2) 19–281 27,37,63	21 (1) 18–155 28,31,58	19 22–773 23,32,43	19 18–850 23,36,49	21 (1) 18–92 27,32,47	15 24–271 29,33,47	10 21–685 30,41,49	5 19–105 37,54,68	
Braginskii R.							1 34					
Checherskii R.		(1)		3 25–30 25,29,30	4 36–47 40,45,47	3 31–62 31,60,62	1 40	6 31–55 33,40,48	3 43–372 43,56,372	8 29–87 34,43,51	2 55–57	
Buda-Koshelevskii R.				1 68				1 42				
Rechitskii R.				1 231		1 20			1 28			
Hoynikskii R.		10 35–70 36,41,53	27 26–116 44,50,56	23 28–87 32,43,50	22 23–242 41,48,60	24 22–88 43,51,57	4 33–52 35,40,49	6 30–58 32,37,39	15 32–264 43,52,58	15 35–79 42,49,58	10 37–64 43,51,60	
Narovlyanskii R.												

(cont.)

A48-T03. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15	16
Kormyanskii R.		7	8	12	12		2	1	4			
		46—124	40—261	70—368	89—517		35—55	114	106—142			
		78,86,93	74,109,149	119,153,190	121,142,163				106,118,136			
Rogachevskii R.						1				1		
						25				25		
Zlobinskii R.			1		1			1	1			
			29		20			26	22			
Svetlogorskii R.						1		1				
						26		33				
Kalinkovichskii R.				1						1		
				32						38		
Mozirskii R.												
Elskii R.		20	24	23	9	10	12	9	9	10	10	1
		51—313	60—474	34—211	44—108	48—288	51—207	54—165	65—274	61—325	78—361	296
		74,87,136	69,81,145	69,83,108	67,71,84	61,73,113	63,76,93	66,78,129	73,85,127	105,126,132	130,168,306	
Oktyabrskii R.												
Petrikovskii R.												
Lelchitskii R.												
Zitkovichskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T04. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Girls. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Gomel City		2 (2)	3 (2)[a]	5	10 (1)	6	11	5	4	5		
		35—40	35—39[b]	22—32	21—79	22—38	21—37	24—42	18—27	18—39		
			35,37,39[c]	24,28,31	30,35,40	22,24,37	22,27,33	26,26,32	19,21,25	24,26,33		
Mozir City				1	1							
				28	59							
Dobrushskii R.		18 (22)	29 (11)	35 (9)	23 (7)	40 (7)	46	33 (5)	29 (1)	28	11	
		27—228	21—205	16—252	16—263	16—280	13—237	17—308	11—243	10—253	16—175	
		33,59,107	26,35,56	27,44,65	21,33,61	24,35,57	24,32,61	24,31,62	21,30,50	20,27,34	18,25,46	
Vetkovskii R.												
Gomelskii R.	4 (1)	25 (12)	56 (20)	46 (18)	56 (16)	58 (5)	70 (5)	84 (1)	62 (1)	69 (2)	34	2
	26—65	22—60	15—89	19—82	15—55	16—893	15—89	12—203	10—73	10—90	11—96	14—18
	28,31,49	27,32,39	27,33,43	26,34,48	24,29,38	22,27,34	22,28,37	21,26,35	25,30,44	20,25,32	20,29,44	
Loevskii R.		22 (12)	19 (3)	24 (2)	13 (2)	15 (3)	23 (1)	34	11	11	4	
		21—78	22—123	21—88	19—245	12—115	19—84	19—118	19—188	12—85	16—86	
		27,29,32	29,36,53	25,29,40	26,29,33	20,32,46	22,36,51	26,31,42	24,53,104	22,28,37	19,37,69	
Braginskii R.							1					
							28					
Checherskii R.		3	2	4	7	7	4	5	5	5	1	
		28—41	32—44	24—38	24—59	29—51	21—32	22—68	26—43	19—30	45	
		28,30,41		25,29,35	27,32,49	30,39,44	23,28,31	23,25,27	32,33,36	23,25,28		
Buda-Koshelevskii R.		1										
		45										
Rechitskii R.				(1)			1	1		1		
							26	16		31		
Hoynikskii R.		6 (1)	15	10	28 (1)	15	6	9	19	24	9	
		27—46	24—68	30—72	24—169	30—68	32—51	14—82	20—57	24—68	23—48	
		37,43,46	29,45,54	34,41,48	40,46,54	43,51,54	36,39,48	22,41,52	33,35,45	36,41,49	40,44,45	
Narovlyanskii R.												

(cont.)

A48-T04. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Kormyanskii R.		10	12	8	8	3	3	1			2	
		80—241	67—248	109—293	76—210	136—178	70—147	86			87—185	
		81,104,127	104,127,181	154,167,180	93,109,162	136,148,178	70,142,147					
Rogachevskii R.				1		1						
				30		23						
Zlobinskii R.			(1)		1	1	1					
					38	35	26					
Svetlogorskii R.							1		1			
							31		28			
Kalinkovichskii R.							1	1	1	1	1	
							35	36	22	29	29	
Mozirskii R.				1 (1)				1				
				100				27				
Elskii R.		23	28	18	23	19	16	19	17	16	12	
		52—309	28—384	32—133	36—582	50—168	54—127	39—553	53—194	44—172	50—291	
		64,80,90	55,76,117	68,82,99	75,101,134	59,74,100	72,83,91	59,77,103	64,73,83	75,89,113	91,133,174	
Oktyabrskii R.								1				
								27				
Petrikovskii R.					1					1		
					28					29		
Lelchitskii R.												
Zitkovichskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T05. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Boys. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Gomel City	3 40—90 40,55,90	54 (13)[a] 19—184[b] 25,32,48[c]	116 (14) 17—289 27,36,47	101 (14) 12—206 26,33,46	61 (7) 14—94 23,29,40	44 (7) 13—142 21,28,39	45 (2) 12—830 23,28,36	40 (2) 13—81 22,29,41	21 (3) 14—142 19,26,46	29 (5) 12—419 19,22,34	19 (2) 13—177 16,23,30	7 13—147 14,19,47
Mozir City		2 (1) 36—51	4 22—51 26,38,48	3 44—55 44,46,55	3 24—39 24,34,39	2 21—38	3 19—36 19,25,36	1 33				
Dobrushskii R.		1 27		(1)	2 (1) 23—76	2 27—41	1 26	3 18—46 18,24,46	1 19		1 23	4 11—28 16,23,26
Vetkovskii R.		1 48	1 133	3 16—76 16,56,76	3 22—108 22,52,108	2 77—233		3 39—278 39,86,278	2 160—377			2 72—80
Gomelskii R.		91 (10) 21—329 32,42,81	118 (9) 18—352 30,37,55	122 (3) 11—389 31,52,72	97 (7) 16—210 37,62,99	79 11—190 42,63,102	51 (1) 12—182 45,66,108	61 11—306 43,65,127	55 25—182 51,68,106	29 17—176 74,114,138	13 14—389 35,59,120	3 (1) 19—73 19,20,73
Loevskii R.		4 17—47 20,23,36	5 33—74 33,34,48	4 23—147 33,53,106	8 20—89 26,39,57	5 25—68 29,36,41	4 25—32 25,26,29	4 17—46 21,30,41	8 23—92 28,33,40	2 38—305		2 33—45
Braginskii R.		3 29—75 29,43,75	2 (2) 23—145		4 22—71 26,44,65	1 59						
Checherskii R.							1 101		1 53	(1)		
Buda-Koshelevskii R.		3 (1) 22—35 22,27,35	2 (2) 86—111	3 26—34 26,31,34	1 89	2 27—312	3 (2) 24—56 24,27,56	1 38	3 (1) 27—296 27,37,296		1 113	
Rechitskii R.			3 42—55 42,52,55	3 24—35 24,29,35	3 (1) 31—44 31,39,44	2 25—29	1 21	3 31—46 31,41,46	2 17—50	1 77	1 24	8 17—74 17,33,51
Hoynikskii R.			1 59		1 22		1 52	2 40—141	1 61			2 19—31

(cont.)

A48-T05. Continued.

Place of residence	Age (years) at the time of examination										
	6	7	8	9	10	11	12	13	14	15	16	17
Narovlyanskii R.												
Kormyanskii R.					1 27				1 51			2 29—58 (1)
Rogachevskii R.			1 28	2 41—42	(2)	1 71	1 35					
Zlobinskii R.			1 (2) 38	1 (1) 30	(1)	2 39—43			1 23			1 24
Svetlogorskii R.			3 34—51 34,45,51	(1)	1 24	2 21—42	4 24—47 31,40,44	1 47	1 488		1 21	1 (1) 21
Kalinkovichskii R.			4 25—48 31,39,45		2 38—52	3 36—63 36,51,63	3 25—66 25,30,66		1 69			
Mozirskii R.		1 113						1 42	1 146			
Elskii R.								2 34—1111				
Oktyabrskii R.												
Petrikovskii R.					1 (1) 27	2 28—55	2 39—44			2 20—21		
Lelchitskii R.			1 (1) 239	1 103		1 83						
Zitkovichskii R.												1 42

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T06. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Girls. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Gomel City	2 (1) 38—46	64 (17)[a] 18—365[b] 25,29,37[c]	102 (29) 18—168 29,38,50	89 (12) 14—87 26,33,43	59 (16) 14—159 22,29,39	61 (19) 13—731 22,29,39	59 (8) 10—96 21,26,42	52 (8) 13—139 20,26,35	29 (3) 12—587 18,26,56	10 (8) 11—28 13,16,25	15 (4) 12—66 18,26,52	4 (1) 14—21 14,17,20
Mozir City		1 48	3 (1) 41—69 41,46,69	5 20—62 27,29,47	6 26—68 27,44,51	4 (1) 16—58 19,24,42	3 28—42 28,36,42	4 15—40 17,27,37	1 31			
Dobrushskii R.	1 79		1 22	2 29—41	(1)	(1)	4 23—85 25,53,82	3 14—38 14,25,38	1 17	1 14	2 10—27	2 59—72
Vetkovskii R.		2 55—139			2 85—173	4 23—898 58,121,523	1 250	1 224	1 33			1 53
Gomelskii R.		71 (9) 20—171 31,41,70	131 (7) 9—332 32,45,76	131 (7) 15—159 30,45,85	84 (3) 13—163 33,56,84	86 (2) 13—169 42,62,101	73 17—171 44,63,97	63 (1) 8—173 35,56,105	62 11—222 43,64,106	30 (1) 13—176 53,91,117	23 (1) 18—190 56,98,130	2 (1) 18—138
Loevskii R.	2 41—56	3 36—63 36,41,63	3 (2) 21—46 21,35,46	2 (1) 35—50	11 (1) 25—58 29,37,50	4 (3) 18—44 18,27,40	7 (1) 26—52 26,35,42	5 19—37 20,20,24	6 31—52 33,41,43	1 57		
Braginskii R.	1 34		2 31—40	2 38—54		1 33	1 40	3 30—48 30,31,48		1 66	1 32	
Checherskii R.		1 20										2 53—66
Buda-Koshelevskii R.		1 (1) 56	3 (2) 27—43 27,42,43	2 37—38	3 15—146 15,26,146	3 23—50 23,33,50	6 14—50 22,24,30	3 (2) 31—45 31,43,45	6 (2) 14—51 20,27,47	1 12		2 32—44
Rechitskii R.			2 40—45	5 (1) 34—91 47,54,56	2 33—41	4 14—72 21,31,53	5 12—55 26,29,36	5 (1) 13—54 23,42,45	2 38—57			1 18

(cont.)

A48-T06. Continued.

Place of residence	Age (years) at the time of examination										
	6	7	8	9	10	11	12	13	14	15	16	17
Hoynikskii R.		1				1						1
		32				23						37
Narovlyanskii R.												
Kormyanskii R.					1		1		2		1	1
					41		46		38—62		26	150
Rogachevskii R.					3 (1)	3		1	1			
					35—60	12—65		41	47			
					35,55,60	12,44,65						
Zlobinskii R.		1 (1)	3 (3)	3	4	1	3	1 (1)	1			2
		55	23—34	22—47	30—62	34	23—49	45	15			34—39
			23,32,34	22,34,47	38,47,56		23,45,49					
Svetlogorskii R.		(1)	1	1	1	1 (1)	4	3	1			9
			42	81	54	816	19—49	25—36	25			19—90
							20,24,38	25,33,36				21,25,30
Kalinkovichskii		2	1			3 (1)	2	1	2			1
R.		37—65	27			46—80	15—20	35	22—47			55
						46,76,80						
Mozirskii R.		1	2			2	1					
		60	67—67			27—61	42					
Elskii R.		1			1				1			
		38			54				249			
Oktyabrskii R.		1	1		2			1	1		(1)	1
		26	33		18—33			23	35			15
Petrikovskii R.			2						1		1	2
			26—41						36		35	16—23
Lelchitskii R.		2		4	1	2	3	1	1			4
		46—104		43—181	61	78—188	40—121	120	57			24—222
				53,63,122			40,68,121					38,52,137
Zitkovichskii R.			1									
			44									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T07. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Boys. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Gomel City	9 (3)[a]	36 (15)	36 (6)	32 (9)	32 (7)	57 (5)	47	35 (2)	7 (1)	4 (1)	2
	18–221[b]	16–190	18–466	14–67	15–253	11–102	12–526	15–83	12–37	14–28	29–30
	27,28,33[c]	24,27,32	21,26,35	19,29,40	22,29,40	20,27,31	21,28,34	22,26,33	17,20,26	17,19,24	
Mozir City			(1)								
Dobrushskii R.		2	1		1		1				
		19–23	48		24		22				
Vetkovskii R.		1	1		2 (1)	3					
		49	30		21–27	25–43					
						25,38,43					
Gomelskii R.	10 (2)	83 (23)	117 (36)	102 (23)	145 (14)	129 (7)	137 (2)	142 (2)	30	1	
	16–45	19–172	15–199	14–293	9–179	14–1067	14–94	12–105	17–71	31	
	23,25,34	25,28,36	23,28,37	24,29,34	22,28,34	21,27,35	24,28,35	23,30,36	25,29,35		
Loevskii R.		1	1	1 (1)	(1)	1 (1)	(1)	2			
		26	14	23		18		18–125			
Braginskii R.							1				
							33				
Checherskii R.								(1)			
Buda-Koshelevskii R.		2		1		1	2		1		
		17–32		15		22	19–46		41		
Rechitskii R.		73 (9)	124 (5)	118 (6)	81 (3)	99 (1)	97	68 (2)	29	7	
		17–831	15–2018	17–1351	16–221	17–219	14–211	24–274	24–193	40–106	
		30,40,55	32,43,58	29,38,58	30,40,56	33,44,59	31,42,54	40,50,66	41,56,68	49,71,100	
Hoynikskii R.		(2)				1	1	1		3	
						36	61	35		36–52	
										36,42,52	
Narovlyanskii R.											
Kormyanskii R.						1				1	
						30				80	

(cont.)

A48-T07. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Rogachevskii R.		40 (5)	43 (1)	47	41	43 (1)	31 (2)	30	16	1	
		16—66	20—74	20—112	21—175	19—172	22—158	20—92	23—91	178	
		26,35,40	30,35,43	29,35,42	29,39,49	28,39,49	41,41,53	39,46,61	38,48,62		
Zlobinskii R.		10 (2)	26 (8)	18 (1)	35 (3)	17 (1)	31	11	5		1
		21—42	17—69	17—133	18—693	17—91	14—150	18—63	22—77		14
		21,26,30	28,33,36	24,33,54	23,28,49	23,27,31	25,39,57	25,33,52	35,36,73		
Svetlogorskii R.		(1)			1		(2)				
					24						
Kalinkovichskii R.											
Mozirskii R.											
Elskii R.			1				1 (1)				
			51				30				
Oktyabrskii R.		3 (1)	1		2	1					
		27—33	22		26—49	20					
		27,32,33									
Petrikovskii R.			1			1		(1)		1	1
			43			29				99	19
Lelchitskii R.			1								
			80								
Zitkovichskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T08. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Girls. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Gomel City	10 (1)[a]	38 (26)	23 (15)	48 (10)	33 (9)	44 (9)	45 (11)	35 (8)	9 (2)	4	1 (1)
	23—58[b]	16—146	13—139	14—138	16—220	10—113	12—307	10—212	10—53	11—42	13
	25,29,35[c]	21,25,37	22,26,31	21,26,30	17,26,31	22,24,30	19,23,29	17,23,29	11,14,18	13,18,32	
Mozir City											
Dobrushskii R.		1 (1)		(1)		3		2	(1)		
		46				18—88		15—26			
						18,22,88					
Vetkovskii R.		2	3	1	1	1 (2)	2				
		40—48	29—38	48	96	47	15—42				
			29,34,38								
Gomelskii R.	8 (3)	67 (44)	76 (44)	118 (27)	133 (21)	120 (11)	134 (12)	119 (5)	37 (1)	(1)	
	19—69	14—73	14—215	7—81	12—123	12—215	9—154	11—877	8—75		
	22,23,31	23,25,34	23,27,32	22,28,35	21,26,32	21,26,32	20,24,33	20,25,32	25,27,33		
Loevskii R.		(2)	1	4	1 (1)	(1)	2			(2)	
			28	28—66	27		18—20				
				33,38,52							
Braginskii R.		1	1 (1)				1	1	(1)		
		27	28				25	153			
Checherskii R.						1	1				
						134	103				
Buda-Koshelevskii R.		2	2	2	(1)		1 (2)	1			
		16—27	26—48	14—17			29	16			
Rechitskii R.		68 (15)	93 (12)	104 (3)	98 (3)	102 (4)	87	89 (1)	44 (1)	8	
		20—113	13—238	19—223	12—1291	17—104	11—820	17—264	14—165	24—118	
		28,33,44	27,38,49	29,39,54	31,39,49	30,37,54	33,47,68	35,45,57	31,41,54	32,45,86	
Hoynikskii R.			1	2	(1)	(1)		1	4		
			23	16—38				19	23—100		
									25,31,68		

(cont.)

A48-T08. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Narovlyanskii R.											
Kormyanskii R.			2 (1)	1			1				
			25—27	23			17				
Rogachevskii R.		41 (10)	50 (3)	51 (1)	42	44 (2)	49	30 (1)	13	7	
		14—614	13—160	15—60	17—124	16—240	16—96	21—89	18—77	35—83	
		28,36,43	29,35,44	27,34,45	27,34,42	27,33,49	29,36,48	29,37,49	30,33,38	35,37,42	
Zlobinskii R.		21 (7)	31 (3)	32 (9)	25 (5)	23 (3)	32 (1)	25	13	3	
		20—46	20—70	21—101	19—52	10—92	12—1894	15—68	9—119	13—65	
		24,28,34	23,33,36	26,31,41	23,29,35	22,26,33	22,30,39	27,31,38	21,33,41	13,18,65	
Svetlogorskii R.			1				2	1			
			24				38—47	22			
Kalinkovichskii R.						1					
						31					
Mozirskii R.				1	1		1				
				20	30		17				
Elskii R.					2	2		1	1	1	
					23—100	40—103		145	326	44	
Oktyabrskii R.				1	1	1 (2)	2 (1)		1		
				31	46	20	16—25		28		
Petrikovskii R.	1				1	2					
	37				45	27—35					
Lelchitskii R.		1	1		2			3			
		51	46		24—47			14—44			
								14,34,44			
Zitkovichskii R.						1					
						65					

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T09. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Boys. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Gomel City	1 24	33 (12)[a] 14—49[b] 23,26,30[c]	50 (8) 16—102 21,26,33	45 (9) 13—892 22,26,31	51 (3) 12—135 21,27,34	47 (1) 9—105 19,25,35	31 (1) 11—62 23,32,40	6 10—75 10,29,44	2 12—18	1 69
Mozir City			1 34	2 35—54	5 (1) 17—35 27,27,35	6 (1) 15—60 22,30,42	1 26			
Dobrushskii R.		1 31	1 (1) 69	4 (2) 27—48 27,36,47	3 (1) 30—41 30,32,41	2 27—27	2 21—27			
Vetkovskii R.			2 24—63	3 34—43 34,34,43			1 352			
Gomelskii R.	16 (6) 11—48 23,29,32	88 (26) 17—102 21,27,32	71 (30) 15—217 21,27,37	74 (25) 13—88 20,25,37	96 (13) 9—146 19,24,34	70 (4) 11—235 19,26,36	76 (2) 11—132 21,27,35	39 (1) 13—117 21,28,39	4 28—36 29,29,33	2 20—22
Loevskii R.		1 (1) 201	1 (1) 35	(1)	2 15—80	4 46—124 48,67,104		2 20—251		
Braginskii R.										
Checherskii R.		1 26			2 54—171	1 165	1 460	1 200		
Buda-Koshelevskii R.		26 13—62 24,35,43	35 (1) 22—109 31,35,44	29 (2) 16—74 23,36,45	22 (1) 18—52 22,33,41	18 22—76 31,36,45	21 16—53 28,33,41	10 16—46 29,34,40	6 3—53 27,31,45	
Rechitskii R.		6 27—51 30,33,38	3 (1) 22—82 22,49,82	4 14—35 17,23,30	3 26—35 26,29,35	7 17—39 23,31,38	4 9—85 12,36,71			
Hoynikskii R.		42 (6) 20—292 30,35,43	52 (7) 19—163 25,34,40	34 19—109 25,41,54	58 (3) 20—163 28,36,48	62 14—2010 33,42,52	61 21—119 30,44,58	32 21—170 37,44,58	9 35—57 40,49,52	

(cont.)

A48-T09. Continued.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Narovlyanskii R.				1 109						
Kormyanskii R.		3 (1) 19–52 19,23,52	12 (1) 21–86 33,38,48	7 23–269 24,36,53	4 28–65 29,31,48	7 19–70 26,30,56	2 32–34			
Rogachevskii R.			1 27	1 29	3 21–32 21,31,32	1 24	1 126			
Zlobinskii R.					1 39					
Svetlogorskii R.			3 (1) 17–31 17,30,31		2 26–30		2 14–25	1 19		
Kalinkovichskii R.		5 29–95 37,38,42	9 (1) 20–108 24,28,49	4 23–36 26,31,34	7 28–45 28,32,39	2 26–36	5 23–148 31,32,44			
Mozirskii R.			1 29	1 65	1 22	1 45				
Elskii R.		2 54–60	4 32–162 36,79,141	2 53–58		2 38–117				
Oktyabrskii R.		1 35	2 28–30		1 27	1 34	1 25			
Petrikovskii R.		2 22–37	3 (1) 27–66 27,53,66	2 38–53	1 25					
Lelchitskii R.			2 47–50	1 207	5 110–825 211,262,625	1 406	5 128–806 265,451,592	5 312–484 334,407,428		
Zitkovichskii R.			(2)			2 31–37				

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T10. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Girls. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Gomel City	(1)	41 (13)[a] 16–77[b] 23,27,35[c]	54 (16) 12–253 22,27,33	62 (4) 15–111 23,30,37	68 (9) 17–88 23,28,33	60 (1) 11–173 19,25,33	42 (2) 10–127 20,26,32	6 (2) 16–35 18,21,33	5 14–61 16,25,32	1 24
Mozir City			2 21–40	2 20–36	3 (1) 20–41 20,29,41	4 20–45 21,27,39	3 13–32 13,27,32	1 31		
Dobrushskii R.		1 26	3 21–34 21,23,34	1 16	6 19–73 21,28,41	5 22–30 25,25,28	2 18–69	1 20	1 24	
Vetkovskii R.	1 60		1 37	1 145	2 27–47	2 21–22		1 30	1 32	
Gomelskii R.	6 (15) 21–35 22,25,26	71 (44) 2–131 22,26,32	66 (32) 13–128 20,25,33	86 (26) 12–126 19,23,29	93 (14) 11–323 19,24,34	67 (12) 9–330 19,24,30	64 (4) 10–140 20,25,32	46 (4) 10–273 20,25,30	2 13–14	1 70
Loevskii R.		3 27–173 27,49,173	3 21–30 21,24,30		4 34–81 34,39,62	1 39	3 (1) 12–18 12,13,18			1 102
Braginskii R.							2 24–37			
Checherskii R.			2 38–107	2 98–112	3 53–99 53,84,99	4 22–348 23,43,205	2 49–75		1 125	
Buda-Koshelevskii R.		22 (1) 20–80 26,33,40	47 (2) 21–62 27,34,38	24 (1) 12–270 27,31,40	32 17–105 25,35,41	30 11–61 23,32,41	25 19–42 25,27,35	12 18–39 24,27,32	11 15–45 18,28,40	1 51
Rechitskii R.		11 15–55 26,30,37	1 (1) 25	4 (2) 22–72 24,30,53	7 (2) 16–53 19,25,38	5 25–29 25,27,28	1 19	2 14–18		
Hoynikskii R.	1 20	47 (9) 19–110 24,32,41	39 (9) 16–454 24,34,51	24 (5) 15–79 24,31,45	44 (1) 15–72 28,33,42	46 (1) 20–284 27,35,43	53 17–152 34,42,53	37 9–1078 30,35,42	10 24–111 31,35,61	
Narovlyanskii R.										

(cont.)

A48-T10. Continued.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Kormyanskii R.		8 19—65 25,32,40	8 21—122 24,30,50	5 24—29 24,26,27	5 22—37 23,29,31	7 13—33 16,32,33	3 25—36 25,30,36	2 78—116		
Rogachevskii R.		2 28—38	3 21—29 21,25,29	1 19	3 22—33 22,30,33	2 26—37	2 35—38	1 14		
Zlobinskii R.		1 36	3 (3) 21—31 21,30,31	5 19—25 20,20,24		2 23—31	2 (1) 20—34			
Svetlogorskii R.		4 20—37 21,22,30	3 (1) 26—32 26,29,32	3 (2) 18—54 18,23,54	3 13—63 13,24,63	5 (1) 21—49 22,23,24	1 (1) 19			
Kalinkovichskii R.		5 23—99 26,30,58	4 (1) 26—113 26,66,109	4 (1) 31—41 32,35,39	1 54	4 21—45 24,29,37	2 19—31			
Mozirskii R.		3 26—62 26,31,62	2 18—27		2 38—48					
Elskii R.			2 32—54	3 40—122 40,86,122			2 41—87	2 32—33		
Oktyabrskii R.			2 24—58	1 21	1 22	1 (1) 23				
Petrikovskii R.				3 24—38 24,28,38	2 29—47	2 74—89			1 21	
Lelchitskii R.		1 870	1 30	2 31—36	1 630	3 196—306 196,298,306	9 124—434 173,288,370	8 177—491 186,265,353	1 201	
Zitkovichskii R.			2 (1) 36—63	1 39	4 13—30 18,24,28		3 36—94 36,40,94			

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T11. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Boys. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Gomel City	2 (2) 18–48	11 (1)[a] 15–78[b] 21,23,30[c]	8 (2) 16–153 25,44,55	4 17–39 18,20,30	4 (1) 18–29 21,25,28		3 21–27 21,21,27	1 11	1 50
Mozir City		1 17	2 20–22			2 15–30			
Dobrushskii R.									
Vetkovskii R.			1 43	1 27					
Gomelskii R.	10 (4) 22–103 23,34,62	53 (19) 13–156 25,34,44	54 (14) 12–134 25,35,42	54 (2) 14–96 24,33,45	80 (5) 12–115 21,28,40	64 (9) 11–74 18,21,35	33 (2) 10–99 18,23,38	3 18–35 18,26,35	
Loevskii R.					1 18				
Braginskii R.									
Checherskii R.									
Buda-Koshelevskii R.		2 13–35	2 16–34			1 56			
Rechitskii R.		3 16–43 16,31,43	3 16–31 16,22,31	4 26–35 29,33,35	2 22–27	6 13–39 16,18,19			
Hoynikskii R.			1 39	1 35					
Narovlyanskii R.									
Kormyanskii R.									
Rogachevskii R.									
Zlobinskii R.									

(cont.)

A48-T11. Continued.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Svetlogorskii R.									
Kalinkovichskii R.									
Mozirskii R.									
Elskii R.							1		
							85		
Oktyabrskii R.									
Petrikovskii R.								1	
								31	
Lelchitskii R.									
Zitkovichskii R.									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T12. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Gomel region, Belarus. Girls. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Gomel City		8 (1)[a]	10 (2)	10 (1)	7 (1)	8 (3)	5 (2)	3	1 (1)
		15–349[b]	11–57	12–97	18–89	10–114	11–27	16–27	45
		17,21,62[c]	14,18,39	12,16,22	18,24,45	14,16,26	13,24,26	16,25,27	
Mozir City		2	2	2	3			1	
		24–54	23–29	15–30	18–28			12	
					18,24,28				
Dobrushskii R.									
Vetkovskii R.					1	(1)	1		
					17		45		
Gomelskii R.	12 (9)	38 (26)	33 (13)	46 (14)	64 (15)	64 (17)	31 (5)	1	
	20–153	14–111	13–58	11–79	8–162	10–78	10–85	35	
	22,29,41	22,37,47	22,29,37	18,28,33	18,24,41	18,21,28	15,21,28		
Loevskii R.									
Braginskii R.			1						
			19						
Checherskii R.									
Buda–Koshelevskii R.		1	1						
		27	39						
Rechitskii R.		3 (1)	(1)	2					(1)
		17–19		15–21		4			
		17,18,19				13–23			
Hoynikskii R.						14,15,19			
Narovlyanskii R.									
						1			
Kormyanskii R.				1		19			
				46					
Rogachevskii R.									

(cont.)

A48-T12. Continued.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Zlobinskii R.		(1)							
Svetlogorskii R.									
Kalinkovichskii R.									
Mozirskii R.									
Elskii R.			1						
			114						
Oktyabrskii R.						1			
						23			
Petrikovskii R.	1								
	23								
Lelchitskii R.					1				
					47				
Zitkovichskii R.									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T13. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Mogilev City	1 (4) 26	8 (19)[a] 18—45[b] 25,30,36[c]	11 (13) 19—44 22,28,39			(1)	1 34	6 14—24 18,19,22	2 15—30		
Bobruisk City											
Hotimskii R.											
Klimovichskii R.	2 (1) 29—59	2 (4) 27—131	6 (2) 24—184 29,114,130	7 (1) 29—132 29,68,97	7 (1) 22—124 27,50,54	6 19—86 21,28,48	3 30—105 30,37,105	2 26—147	1 105		
Kostyukovichskii R.											
Mstislavskii R.											
Krichevskii R.	4 (14) 26—65 28,37,54	15 (21) 24—75 28,34,45	11 (17) 18—75 25,34,43	15 (11) 21—73 24,30,50	10 (6) 14—37 18,23,30	4 (3) 12—52 23,38,48	1 (1) 21				
Cherikovskii R.											
Krasnopolskii R.											
Goretskii R.											
Chausskii R.	5 (11) 18—52 32,44,47	10 (6) 24—149 33,38,51	10 (2) 24—127 31,38,51	13 (4) 21—119 24,39,65	7 (2) 21—96 29,32,61	3 (3) 30—84 30,42,84	(1)				
Slavgorodskii R.	9 (7) 25—136 28,39,53	12 (4) 26—142 34,44,70	20 (2) 20—327 27,45,63	14 (2) 21—133 28,41,57	20 (3) 19—234 27,43,63	11 17—102 36,41,74	14 (1) 16—80 19,30,48	16 14—196 20,25,74	25 16—258 21,34,44	15 14—132 22,29,52	1 61
Shklovskii R.											
Mogilevskii R.		(1)							1 15		

(cont.)

A48-T13. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Bykhovskii R.	33 (2)	33 (8)	23 (1)	9 (2)	17 (1)	5	2	2			
	27—133	30—381	21—125	33—116	25—86	32—77	47—178	68—68			
	37,47,61	40,51,79	41,50,63	39,70,77	36,54,64	58,66,76					
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T14. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Mogilev City	5 (2)[a] 26—34[b] 28,30,30[c]	11 (16) 19—44 24,27,30	14 (14) 20—36 24,25,30			1 34		1 (1) 21	(1)		
Bobruisk City											
Hotimskii R.											
Klimovichskii R.	3 (3) 29—80 29,34,80	3 (1) 17—78 17,38,78	2 (1) 33—37	6 (3) 23—74 29,40,59	5 27—96 29,31,32	6 19—243 36,43,90	5 19—137 35,50,90	3 26—59 26,45,59			
Kostyukovichskii R.											
Mstislavskii R.											
Krichevskii R.	3 (21) 25—38 25,34,38	10 (24) 25—96 29,36,63	13 (17) 19—62 26,33,45	10 (12) 19—70 25,29,45	9 (4) 22—42 23,24,29	9 (9) 12—41 19,22,28	2 14—19				
Cherikovskii R.											
Krasnopolskii R.											
Goretskii R.											
Chausskii R.	4 (10) 29—48 30,32,40	7 (8) 21—57 24,39,44	6 (4) 21—49 27,31,34	13 (4) 19—147 24,31,47	8 (3) 21—44 28,31,37	4 (2) 24—37 24,25,31	1 (1) 20			1 23	
Slavgorodskii R.	6 (7) 32—371 41,44,69	16 (8) 19—199 29,39,58	10 (8) 23—70 33,46,55	13 (5) 18—163 23,34,42	17 (2) 23—88 26,31,50	14 (2) 14—318 26,27,36	17 (4) 9—63 18,24,35	22 (3) 14—331 24,32,39	17 (3) 19—141 22,34,41	14 (2) 10—141 22,25,36	3 21—38 21,34,38
Shklovskii R.											
Mogilevskii R.				1 21							

(cont.)

A48-T14. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Bykhovskii R.	31 (4)	34 (5)	19 (3)	20 (3)	14 (2)	12	9 (1)	1			
	26—138	21—101	30—241	25—175	29—87	18—121	15—87	217			
	37,51,85	33,41,51	36,57,98	44,52,63	32,42,70	27,46,66	26,32,47				
Kruglianskii R.											
Belynichskii R.											
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.											
Glusskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T15. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Mogilev City	9 (5)[a] 22—46[b] 24,29,30[c]	29 (19) 23—40 28,29,31	45 (27) 15—67 24,28,33	79 (37) 18—90 24,28,32	63 (20) 11—86 22,26,33	72 (12) 15—77 19,23,29	102 (7) 10—85 21,25,31	75 (6) 9—126 18,23,27	70 (3) 6—69 18,25,30	86 (3) 11—92 20,24,29	29 (1) 13—75 19,22,28	1 12
Bobruisk City												
Hotimskii R.							1 16					
Klimovichskii R.												
Kostyukovichskii R.		13 (12) 20—85 30,37,44	4 (3) 20—129 37,55,93	4 54—120 63,86,109	9 (1) 16—228 26,38,109	8 (1) 18—83 22,24,69	11 (2) 20—116 22,28,47	26 (2) 12—354 18,26,40	30 (2) 11—292 19,23,37	7 17—933 18,27,91	1 33	
Mstislavskii R.												
Krichevskii R.												
Cherikovskii R.		9 31—100 47,52,63	14 (1) 24—58 32,34,41	1 36	2 30—45	24 21—115 27,35,45	15 19—80 29,33,61	17 20—153 31,39,45	21 17—92 24,28,36			
Krasnopolskii R.		12 (5) 21—97 32,58,66	5 (3) 25—61 25,33,54	2 62—68	1 25	1 29	1 56		2 20—44			
Goretskii R.												
Chausskii R.		26 (16) 26—131 37,51,67	22 (6) 21—100 28,39,51	15 (6) 21—88 28,43,53	11 (5) 25—91 32,53,61	25 (4) 17—118 26,34,50	17 (2) 17—71 20,32,43	18 (1) 12—103 23,42,57	9 (3) 12—122 20,31,74	21 (1) 21—94 35,50,58	13 24—105 34,47,64	3 40—362 40,122,362
Slavgorodskii R.												
Shklovskii R.												
Mogilevskii R.		10 (22) 17—52 27,30,36	44 (56) 20—125 24,28,39	56 (40) 16—80 21,26,31	47 (57) 14—94 21,24,28	59 (53) 15—57 20,24,30	62 (54) 13—112 19,25,35	79 (41) 10—243 16,21,28	88 (43) 10—129 15,19,26	85 (29) 9—162 13,18,25	28 (16) 10—243 14,18,27	14 (3) 9—50 12,18,25

(cont.)

A48-T15. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Bykhovskii R.									1			
									93			
Kruglianskii R.												
Belynichskii R.				1								
				32								
Klichevskii R.		3 (1)	4	4 (1)	7	10	10	9	2	8	2	
		46—50	55—160	39—114	18—96	24—109	26—152	36—131	19—30	21—144	58—59	
		46,48,50	57,61,112	52,66,90	27,60,79	34,51,81	40,57,94	56,66,76		50,64,77		
Kirovskii R.												
Bobruiskii R.												
Osipovichskii R.												
Glusskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Originial data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T16. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Mogilev City	2 (4) 33—39	25 (13)[a] 17—57[b] 27,32,37[c]	63 (21) 16—43 25,29,34	110 (24) 11—100 24,28,33	61 (25) 9—85 20,25,31	85 (13) 10—59 21,26,31	103 (7) 9—112 21,25,30	78 (11) 10—72 20,25,29	71 (7) 9—56 17,21,28	92 (8) 11—55 18,24,30	42 8—71 18,24,29	1 18
Bobruisk City												
Hotimskii R.												
Klimovichskii R.												
Kostyukovichskii R.		14 (6) 21—120 28,33,76	2 (1) 60—83	9 (2) 26—171 41,54,80	8 (1) 24—109 35,48,90	12 (1) 18—152 28,48,72	17 (3) 16—66 22,23,30	31 (8) 8—239 16,21,38	24 (3) 11—191 16,23,42	10 23—99 34,47,66	5 13—63 13,32,50	
Mstislavskii R.												
Krichevskii R.												
Cherikovskii R.		13 (1) 24—63 34,38,49	11 27—72 31,35,51	3 28—65 28,30,65	2 21—64	23 17—75 29,31,38	10 27—145 40,58,84	33 12—82 25,31,43	20 20—58 24,28,36			
Krasnopolskii R.		15 (4) 25—83 39,44,55	6 29—83 39,47,66	1 97	2 59—87			1 26		1 49	1 15	
Goretskii R.		(1)										
Chausskii R.		23 (14) 26—145 35,49,59	25 (6) 23—78 37,49,62	14 (2) 21—65 26,37,47	22 (7) 17—108 35,44,59	15 (4) 17—398 22,36,60	23 (4) 17—99 24,37,58	30 (2) 12—90 21,25,43	21 (1) 12—90 21,31,37	23 10—171 23,39,47	13 19—103 28,33,61	1 37
Slavgorodskii R.												
Shklovskii R.												
Mogilevskii R.		7 (19) 24—37 28,29,35	30 (52) 19—73 25,28,40	45 (47) 17—69 23,26,40	49 (58) 14—83 20,26,31	53 (46) 13—57 19,22,26	55 (66) 11—63 18,22,34	75 (42) 11—43 14,22,29	42 (57) 10—86 13,17,28	55 (49) 9—147 14,18,28	41 (35) 9—43 13,17,22	19 (17) 9—41 12,14,23

(cont.)

A48-T16. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Bykhovskii R.												
Kruglianskii R.												
Belynichskii R.				1								
				22								
Klichevskii R.		2 (1)	4 (1)	6	1	11	7	8	2	6	1	3
		52—88	32—41	26—108	80	18—112	16—144	31—96	38—48	37—145	267	49—126
			33,37,40	29,36,70		42,55,61	21,54,88	41,45,72		44,71,118		49,78,126
Kirovskii R.												
Bobruiskii R.												
Osipovichskii R.							1					
							46					
Glusskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T17. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	2 (17)	66 (212)[a]	55 (137)	75 (91)	87 (68)	79 (80)	121 (75)	127 (76)	126 (40)	82 (26)	56 (26)	6
	22—29	16—115[b]	16—60	15—127	14—69	11—65	11—138	9—95	9—125	7—409	8—188	11—22
		23,26,34[c]	21,25,32	21,23,28	18,22,26	17,20,24	15,18,26	15,18,23	15,19,36	13,19,26	11,16,23	14,15,18
Bobruisk City			1 (1)			1	1					
			27			29	22					
Hotimskii R.		(1)	1 (1)	(3)	(4)	(1)	1		1 (1)			
			23				42		18			
Klimovichskii R.							1					
							14					
Kostyukovichskii R.		6 (1)		5 (1)	2 (1)	4 (2)	6	10	13 (1)	5 (1)	3	
		26—79		18—60	24—432	17—49	21—79	15—106	14—131	16—77	31—56	
		28,43,66		24,35,46		22,34,45	32,34,39	23,31,42	34,58,80	28,34,45	31,37,56	
Mstislavskii R.												
Krichevskii R.				1								
				35								
Cherikovskii R.		1	2	1 (1)	3	3	7	3	7	7	5	
		41	22—60	33	32—165	77—141	53—124	50—76	84—200	60—167	75—190	
					32,100,165	77,84,141	59,83,106	50,58,76	96,145,194	86,100,110	78,89,137	
Krasnopolskii R.		1	6 (1)	18 (2)	33 (4)	8 (2)	8 (1)	17	11	8	4	2
		32	20—155	18—63	18—109	16—75	42—222	13—728	20—465	32—180	21—398	16—38
			30,35,51	23,26,34	24,31,39	20,32,54	52,70,110	35,48,124	34,102,148	36,49,78	26,39,221	
Goretskii R.							(1)					
Chausskii R.		12 (13)	42 (20)	35 (11)	66 (10)	56 (12)	22 (2)	48	9 (1)	4	1	
		22—107	16—97	19—85	16—86	12—63	15—164	14—93	18—59	20—42	46	
		24,28,34	24,28,37	22,29,42	21,26,34	21,29,36	19,29,36	20,26,31	21,32,38	22,29,37		
Slavgorodskii R.												
Shklovskii R.												

(cont.)

A48-T17. Continued.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Mogilevskii R.	(1)	5 (6)	5 (5)	16 (7)	10 (4)	9 (1)	12 (1)	8 (3)	8 (4)	5 (3)	3 (1)	
		25—46	22—41	19—57	16—75	12—60	13—32	12—58	11—30	15—44	13—34	
		26,29,30	24,24,34	21,23,26	20,25,32	19,21,26	18,22,26	14,21,34	15,18,23	16,27,35	13,14,34	
Bykhovskii R.	3 (1)	15 (11)	17 (2)	41 (4)	62 (13)	59 (10)	58 (5)	76 (4)	64 (3)	82 (2)	38 (2)	
	30—63	23—59	24—84	16—54	14—373	14—47	9—65	10—92	10—142	11—109	15—271	
	30,48,63	28,31,41	30,31,39	23,28,35	21,29,35	20,24,31	18,24,35	19,23,31	20,27,36	21,30,46	27,35,47	
Kruglianskii R.												
Belynichskii R.									1			
									15			
Klichevskii R.												
Kirovskii R.												
Bobruiskii R.		(1)	1		1	(1)		(1)				
			20		18							
Osipovichskii R.												
Glusskii R.		1 (2)	2	(5)	2	4 (5)		2	3	1	(1)	
		44	18—18		17—26	16—22		12—353	14—16	14		
						17,21,22			14,15,16			

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T18. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	1 (12) 22	40 (183)[a] 19–88[b] 24,28,36[c]	37 (125) 14–91 22,25,32	81 (101) 13–106 20,24,31	86 (66) 12–226 18,21,26	94 (100) 11–97 17,20,23	116 (88) 11–62 15,18,22	107 (70) 9–79 14,17,28	151 (70) 7–94 14,18,29	94 (33) 8–141 13,20,34	84 (45) 8–59 12,14,18	2 (6) 13–15
Bobruisk City		(1)	(1)									
Hotimskii R.				(3)	1 (3) 15	1 17	(2)	2 13–37	1 22			
Klimovichskii R.												
Kostyukovichskii R.		2 (1) 31–35	4 (1) 27–39 29,34,38	2 20–22	3 (1) 16–36 16,21,36	12 (5) 19–84 21,33,49	13 11–358 23,31,40	12 (1) 14–74 21,37,45	8 (1) 12–115 21,42,70	2 26–28	6 31–174 41,51,54	
Mstislavskii R.												
Krichevskii R.							1 19	1 10	1 41			
Cherikovskii R.			4 (2) 23–150 27,44,104	4 (1) 22–37 27,34,36	3 26–188 26,30,188	7 27–90 37,52,89	6 38–180 43,132,151	9 18–176 34,74,105	9 48–142 53,81,111	6 22–612 43,75,345	3 47–112 47,67,112	
Krasnopolskii R.		4 (1) 31–64 35,47,60	5 (2) 21–46 23,24,33	20 (15) 18–96 23,27,41	21 (9) 12–78 24,26,31	10 (2) 15–189 22,27,50	13 22–89 33,47,63	9 20–138 32,42,80	8 37–253 39,71,108	8 (1) 30–189 32,51,76	4 (1) 12–114 18,46,91	
Goretskii R.								1 12	(1)			
Chausskii R.		14 (13) 23–214 27,30,40	45 (27) 13–74 23,29,37	28 (8) 18–44 22,26,30	69 (15) 13–114 20,28,33	63 (18) 13–64 21,25,34	12 (1) 11–58 19,22,27	68 (2) 11–86 18,23,29	8 (2) 10–33 18,23,30	1 31		
Slavgorodskii R.												
Shklovskii R.												

(cont.)

A48-T18. Continued.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Mogilevskii R.	2 (1)	6 (8)	4 (9)	7 (4)	7 (6)	5	9 (4)	5 (2)	7 (5)	3 (5)	7 (7)	1
	23—25	19—34	23—34	17—28	14—27	14—25	14—35	11—17	9—29	16—16	12—34	16
		23,24,26	25,27,31	20,23,28	20,20,24	20,20,23	14,21,21	14,15,15	11,14,18	16,16,16	13,25,26	
Bykhovskii R.		16 (10)	18 (7)	25 (11)	46 (18)	78 (9)	63 (9)	49 (14)	46 (14)	61 (14)	42 (6)	
		26—62	22—54	20—85	14—57	11—66	11—158	9—57	10—87	11—98	12—163	
		27,32,37	28,31,40	27,35,38	21,24,33	20,25,31	18,24,31	16,19,30	18,22,34	18,25,39	19,22,30	
Kruglianskii R.												
Belynichskii R.								(1)				
Klichevskii R.				(1)								
Kirovskii R.												
Bobruiskii R.		(1)	1	(1)	(2)	2 (3)	2 (1)		(1)			
			37			17—18	16—61					
Osipovichskii R.												
Glusskii R.		1 (1)	(1)	(1)	1 (1)	(6)	3 (2)	2 (2)	1	2		
		31			22		16—18	15—21	18	24—35		
							16,16,18					

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T19. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	3 (4)[a]	97 (78)	150 (104)	145 (83)	147 (53)	99 (31)	87 (14)	165 (19)	89 (11)	53 (7)	20 (3)
	22—27[b]	15—65	12—115	12—274	10—298	10—82	8—69	9—72	8—82	7—41	9—70
	22,23,27[c]	22,25,28	21,23,27	20,23,30	18,22,27	15,20,27	15,20,23	15,19,23	14,18,22	13,16,21	11,15,20
Bobruisk City											
Hotimskii R.		1 (4)	2 (12)	6 (6)	2	2 (2)	1 (1)	(1)			
		20	22—68	20—37	17—17	14—16	14				
				20,21,27							
Klimovichskii R.		4 (2)	11 (1)	8	21 (1)	9 (1)	27 (1)	10 (1)	1 (1)		
		22—31	20—42	20—35	17—213	17—34	13—45	13—44	30		
		24,27,30	22,23,29	21,25,30	20,24,27	21,26,27	17,22,25	17,21,22			
Kostyukovichskii R.		1	3 (2)	9	8 (1)	6	7 (2)	5	5 (1)		
		22	33—43	29—155	20—90	17—58	14—124	28—192	25—62		
			33,34,43	35,39,53	21,28,40	27,32,37	15,60,76	45,54,74	47,60,62		
Mstislavskii R.											
Krichevskii R.								1			
								32			
Cherikovskii R.		32 (8)	35 (12)	43 (6)	37 (1)	24 (1)	19	14 (1)	19	11	1
		19—121	20—104	16—184	19—142	14—87	14—118	15—141	10—81	13—136	43
		27,35,44	25,33,56	25,33,56	24,30,44	19,31,49	18,24,31	19,43,71	23,27,43	20,44,62	
Krasnopolskii R.	3	21 (3)	46	36 (1)	49	30 (1)	35	37	22	20	4
	19—71	19—133	20—133	24—129	19—528	17—179	17—204	15—195	12—235	16—218	30—214
	19,53,71	28,47,61	29,38,52	33,46,63	33,48,85	25,31,49	27,36,54	29,40,64	25,37,57	33,46,92	32,46,136
Goretskii R.											
Chausskii R.		3 (10)	14 (8)	8 (4)	18 (8)	10 (11)	20 (1)	22 (2)	10 (1)	2	
		25—36	18—35	16—24	14—29	16—56	11—33	13—37	14—28	22—35	
		25,26,36	21,23,26	16,18,21	18,21,22	18,19,20	19,23,28	18,22,25	16,21,22		
Slavgorodskii R.						1	1	6		2	
						27	21	24—80		22—30	
								26,34,75			

(cont.)

A48-T19. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Shklovskii R.				1 20							
Mogilevskii R.		4 (3) 21—178 21,26,104	13 (3) 14—29 18,21,25	9 (5) 16—57 21,25,34	6 (4) 18—37 22,26,27	14 (6) 14—267 17,24,29	9 10—45 15,23,34	15 (2) 11—39 16,20,24	9 15—77 18,21,35	2 19—23	
Bykhovskii R.		22 (2) 19—315 27,38,52	21 (2) 13—106 27,32,42	30 (1) 18—85 25,34,46	27 19—242 23,34,59	44 (1) 19—110 25,32,49	33 (2) 14—309 26,33,43	19 13—83 23,35,54	29 10—117 28,37,47	14 28—106 32,39,57	4 27—55 29,34,47
Kruglianskii R.						(1)					
Belynichskii R.				1 23							
Klichevskii R.											
Kirovskii R.											
Bobruiskii R.											
Osipovichskii R.									1 18		1 29
Glusskii R.				1 28						1 10	

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T20. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Mogilev City	2 (7)	95 (89)[a]	132 (125)	148 (95)	143 (62)	97 (47)	87 (23)	118 (32)	80 (33)	73 (33)	19 (8)
	25—31	11—120[b]	11—72	10—154	10—218	9—125	10—119	8—74	10—77	9—73	10—63
		22,26,30[c]	21,25,31	20,24,29	17,22,30	17,21,28	15,18,23	13,18,24	14,17,22	12,15,21	13,17,23
Bobruisk City											
Hotimskii R.		(2)	(4)	2 (4)	(1)		3 (1)		(1)		
				14—47			8—17				
							8,16,17				
Klimovichskii R.		2 (1)	5 (1)	11 (2)	23 (3)	4 (1)	21	3		1	
		21—23	18—28	19—29	13—50	17—42	11—40	17—31		21	
			19,21,22	21,23,26	17,21,27	18,20,31	17,20,26	17,27,31			
Kostyukovichskii R.		1	3	7 (1)	5	12	6	5	4	4 (3)	
		23	21—29	19—440	20—64	17—162	22—68	11—56	12—40	13—78	
			21,21,29	23,44,181	20,29,55	24,53,89	23,39,63	32,40,53	13,20,33	17,26,54	
Mstislavskii R.											
Krichevskii R.											
Cherikovskii R.	1 (2)	13 (17)	55 (19)	43 (4)	37 (2)	26 (1)	10 (2)	14 (1)	23	8	3
	43	25—111	16—303	19—183	15—187	8—99	14—93	11—63	12—536	13—74	19—38
		25,42,55	26,34,52	26,36,52	24,32,44	17,30,42	18,29,37	26,41,47	18,26,36	23,41,46	19,27,38
Krasnopolskii R.		21 (4)	28 (4)	33	26 (1)	24 (1)	46 (1)	32	25	11	2
		23—194	18—122	17—156	14—113	17—171	15—284	13—143	17—784	21—402	34—36
		30,41,54	25,39,59	26,35,56	23,33,46	23,35,54	25,31,45	24,31,45	27,33,45	26,29,100	
Goretskii R.											
Chausskii R.		3 (10)	11 (7)	13 (10)	13 (6)	10 (4)	25 (6)	17 (2)	10	2 (1)	
		21—23	13—37	14—33	13—23	13—25	11—40	8—63	15—64	13—20	
		21,23,23	20,22,28	16,21,24	15,19,22	15,16,21	18,22,31	14,17,23	16,21,22		
Slavgorodskii R.					1	2	2				
					38	23—137	17—22				
Shklovskii R.			1								
			23								

(cont.)

A48-T20. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Mogilevskii R.		7 (5)	9 (2)	7 (8)	5 (3)	14 (6)	15 (1)	5 (1)	12 (1)	4	
		20—36	20—30	14—63	15—30	14—48	13—44	10—127	12—43	11—28	
		21,26,34	22,25,25	19,24,33	21,21,28	20,25,43	14,24,32	12,27,27	15,19,25	12,20,27	
Bykhovskii R.		20 (3)	37 (1)	30 (1)	45 (2)	46 (4)	43 (4)	30 (1)	21	32	7
		17—244	15—321	16—159	13—94	8—156	10—102	12—267	14—102	9—105	20—62
		22,34,74	33,43,57	24,33,46	24,30,40	24,29,36	20,25,42	20,25,43	20,24,37	18,28,49	22,34,57
Kruglianskii R.											
Belynichskii R.					1		1				
					18		22				
Klichevskii R.											
Kirovskii R.					1						
					21						
Bobruiskii R.		1									
		22									
Osipovichskii R.											
Glusskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T21. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Mogilev City	10	62 (47)[a]	84 (48)	115 (62)	114 (42)	92 (33)	131 (32)	66 (18)	23 (3)	1
	16—95	16—53[b]	13—180	11—130	11—89	8—52	7—155	8—121	10—206	19
	20,30,38	20,23,28[c]	19,23,30	18,22,29	17,21,25	16,19,24	15,19,27	15,18,25	13,20,27	
Bobruisk City										
Hotimskii R.										
Klimovichskii R.	1	12 (1)	10 (5)	10 (6)	22 (5)	20 (2)	19	10	8	
	27	21—29	15—54	14—52	13—76	12—85	13—55	12—138	11—29	
		21,23,26	18,26,29	19,24,25	16,19,28	16,22,29	15,23,26	15,24,27	11,12,21	
Kostyukovichskii R.				1	2					
				39	32—112					
Mstislavskii R.				(1)						
Krichevskii R.		1	2			3	2	2		
		57	24—25			19—75	83—98	56—177		
						19,23,75				
Cherikovskii R.	2 (2)	4 (1)			1			1		
	28—37	19—125			87			18		
		23,47,96								
Krasnopolskii R.	2	28 (1)	48 (2)	30 (3)	51 (2)	21 (1)	18 (1)	17	14	
	29—175	23—956	17—272	18—272	10—298	16—293	10—1590	14—246	31—3238	
		33,45,83	25,33,53	34,51,77	28,41,89	31,46,95	18,32,43	57,84,120	37,45,151	
Goretskii R.			1 (1)	1	3	(1)	3 (1)			
			17	21	18—23		14—21			
					18,19,23		14,14,21			
Chausskii R.	1	12 (3)	7	18 (2)	9 (5)	15	16	15	11	2
	20	16—67	21—51	16—330	15—81	12—41	11—93	12—79	16—146	22—181
		27,43,57	22,40,48	24,32,46	21,27,50	17,23,30	14,31,51	16,21,40	28,38,48	
Slavgorodskii R.		1	1	6	3	2	3			
		38	46	24—137	46—163	62—69	59—206			
				41,59,91	46,117,163		59,105,206			

(cont.)

A48-T21. Continued.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Shklovskii R.					(1)					
Mogilevskii R.	1	7 (20)	13 (18)	13 (12)	18 (10)	9 (6)	11 (3)	2	5	1
	23	17—48	13—46	14—116	12—26	11—30	8—36	10—16	12—30	23
		20,23,24	20,24,29	19,21,31	15,17,21	14,21,27	19,22,28		13,19,29	
Bykhovskii R.	1	14	17 (1)	21	35	29	30	15	16	6
	35	17—89	20—84	22—103	18—113	18—117	23—204	10—82	20—95	25—252
		32,40,47	25,37,50	27,33,49	29,37,68	31,39,51	36,48,75	30,39,57	33,45,59	49,62,85
Kruglianskii R.										
Belynichskii R.										
Klichevskii R.										
Kirovskii R.			1							
			32							
Bobruiskii R.			(1)							
Osipovichskii R.				(1)						
Glusskii R.										

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T22. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Mogilev City	8 (5)[a]	48 (34)	95 (56)	131 (65)	111 (52)	106 (47)	127 (42)	82 (36)	35 (14)	9 (1)
	22—42[b]	15—97	13—331	11—95	11—109	9—77	7—405	9—47	9—36	11—50
	24,26,30[c]	22,26,33	20,25,31	18,22,28	16,20,26	15,19,25	14,18,24	14,18,23	13,17,22	14,19,23
Bobruisk City				(2)						
Hotimskii R.										
Klimovichskii R.	1	11 (2)	8 (4)	13 (4)	15 (5)	29 (2)	22 (4)	20 (5)	4 (3)	
	35	17—28	17—68	16—59	14—33	11—42	11—69	11—123	13—21	
		21,24,26	20,24,30	19,23,26	17,19,25	13,18,23	15,22,28	13,16,21	14,17,20	
Kostyukovichskii R.							2			
							12—76			
Mstislavskii R.										
Krichevskii R.		1				4	3	3		
		24				18—25	13—23	23—33		
						19,20,23	13,21,23	23,33,33		
Cherikovskii R.	3	3 (1)	1		6					
	33—38	19—38	23		11—30					
	33,37,38	19,31,38			16,21,26					
Krasnopolskii R.	3	35 (1)	51 (3)	29 (6)	31 (5)	24 (4)	10	18	12	1
	30—50	19—200	16—191	15—180	14—220	16—263	17—239	21—257	22—123	259
	30,32,50	27,39,64	26,37,69	19,26,53	28,43,86	33,65,101	36,50,122	31,45,95	40,76,99	
Goretskii R.		1 (1)	4	2 (2)	4	1		2	1 (1)	
		22	14—24	21—78	16—28	21		14—15	20	
			16,20,23		18,20,24					
Chausskii R.	1	13	7 (2)	10 (1)	28 (2)	13	14 (4)	14 (2)	6	3
	34	17—81	19—73	17—96	9—67	15—333	11—48	10—57	14—78	16—38
		22,27,38	24,31,53	22,41,42	21,31,38	21,30,50	14,20,27	17,21,29	22,52,59	16,21,38
Slavgorodskii R.		1	2	4	4	1	1			
		37	22—49	19—53	73—152	110	73			
				30,41,47	73,81,120					

(cont.)

A48-T22. Continued.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Shklovskii R.		1	(1)	1 (1)		(2)				
		28		16						
Mogilevskii R.	(1)	7 (18)	10 (14)	14 (9)	12 (9)	12 (9)	4 (3)	2 (2)	2	
		18–52	15–35	17–44	15–48	11–26	13–35	13–16	12–21	
		18,22,38	17,23,27	20,24,35	16,18,33	13,17,21	14,21,31			
Bykhovskii R.	1	18	17	20	33 (1)	28	18	24	17	4
	66	24–51	17–114	14–157	17–131	14–119	20–253	15–91	13–166	32–92
		30,34,43	22,29,34	22,29,41	26,37,51	29,40,60	25,43,54	26,30,41	23,36,73	38,45,69
Kruglianskii R.										
Belynichskii R.										
Klichevskii R.										
Kirovskii R.							1			
							12			
Bobruiskii R.										
Osipovichskii R.				(1)				(1)		
Glusskii R.									1	
									31	

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T23. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Boys. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Mogilev City	11 (4)[a]	38 (30)	58 (12)	52 (8)	51 (10)	60 (17)	55 (29)	39 (11)	15 (3)
	16–34[b]	14–97	12–98	10–122	11–145	11–89	10–136	10–75	11–146
	22,26,33[c]	18,21,30	18,21,26	18,21,31	16,22,30	16,21,27	15,18,22	14,17,25	15,19,22
Bobruisk City									
Hotimskii R.									
Klimovichskii R.									
Kostyukovichskii R.									
Mstislavskii R.									
Krichevskii R.									
Cherikovskii R.	1	5 (2)	10 (1)	1	4	5	3	2	2
	28	19–44	22–318	83	34–98	46–113	66–108	48–56	52–57
		29,33,40	39,52,70		44,66,88	46,66,67	66,84,108		
Krasnopolskii R.	3 (1)	9 (1)	18 (1)	10	17 (1)	28	39	28	12
	21–82	16–53	20–124	20–83	15–81	19–108	11–239	6–157	13–617
	21,26,82	18,29,38	28,32,37	23,25,32	23,30,41	23,34,62	22,33,52	18,22,50	23,30,47
Goretskii R.									
Chausskii R.									
Slavgorodskii R.	1	15 (1)	10 (1)	20 (1)	18	10	5		
	46	18–120	17–189	16–75	20–83	14–90	19–63		
		28,34,47	31,37,85	22,28,47	26,34,53	38,51,74	42,44,60		
Shklovskii R.									
Mogilevskii R.	5	24 (4)	16 (1)	30 (1)	15 (1)	23	20 (1)	15	3
	23–76	16–49	16–98	10–51	11–73	11–66	13–71	11–79	19–85
	24,25,36	22,27,32	23,33,42	17,25,35	25,32,38	16,30,38	23,32,41	17,35,50	19,52,85
Bykhovskii R.	1	2	3	4	3	8	5	3	2
	33	28–31	23–28	44–92	36–40	30–65	36–54	39–70	64–104
			23,25,28	45,50,73	36,37,40	36,40,59	43,46,54	39,47,70	

(cont.)

A48-T23. Continued.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Kruglianskii R.									
Belynichskii R.									
Klichevskii R.									
Kirovskii R.									
Bobruiskii R.									
Osipovichskii R.									
Glusskii R.									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T24. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Mogilev region, Belarus. Girls. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Mogilev City	6 (5)[a]	41 (19)	52 (15)	44 (10)	61 (6)	54 (13)	43 (10)	24 (10)	9 (3)
	16—34[b]	14—116	11—77	13—84	11—54	10—93	10—44	10—79	13—64
	19,26,30[c]	19,23,29	18,22,29	22,26,34	17,20,29	16,18,25	13,16,21	13,18,21	18,22,31
Bobruisk City									
Hotimskii R.									
Klimovichskii R.									
Kostyukovichskii R.									
Mstislavskii R.									
Krichevskii R.									
Cherikovskii R.		2	7	4	6	6	10 (1)	3	2
		51—102	21—160	32—111	19—72	23—66	19—151	31—152	40—93
			24,29,79	35,38,75	29,48,67	26,35,59	34,69,84	31,44,152	
Krasnopolskii R.	3	9 (1)	14	22 (1)	18	40 (1)	37	32 (1)	18 (1)
	32—35	20—39	14—288	12—267	10—50	9—354	11—372	12—235	12—110
	32,34,35	25,30,34	22,27,37	19,28,52	22,24,28	21,33,55	19,25,38	16,25,51	18,21,26
Goretskii R.									
Chausskii R.	1			1	1				
	29			29	22				
Slavgorodskii R.		19 (1)	14	15 (1)	10 (1)	10	6		
		21—87	17—98	18—165	17—66	17—71	26—137		
		30,36,47	26,30,49	26,33,65	23,31,46	19,26,40	41,46,49		
Shklovskii R.									
Mogilevskii R.	6 (1)	20 (3)	35 (3)	26	26	18	23 (1)	13	6
	24—209	11—68	11—66	14—88	15—191	13—70	10—78	14—40	10—48
	25,29,36	20,27,39	18,22,31	19,23,33	20,26,36	19,24,33	19,27,30	14,22,30	16,17,34
Bykhovskii R.	1	4	3	6	4 (1)	10 (1)	6 (1)	2	
	24	26—56	25—34	22—36	31—286	17—63	11—124	33—43	
		30,40,51	25,27,34	23,30,33	33,41,166	28,32,46	33,37,45		

(cont.)

A48-T24. Continued.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Kruglianskii R.								(1)	
Belynichskii R.									
Klichevskii R.									
Kirovskii R.									
Bobruiskii R.									
Osipovichskii R.									
Glusskii R.									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T25. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Klincy City	98 (5)[a]	131 (3)	67 (1)	12 (1)	9	11	12	9	7	5	
	27–212[b]	22–667	28–462	23–75	14–70	14–69	14–113	14–428	12–76	22–83	
	46,56,73[c]	43,54,77	40,54,68	31,37,44	27,35,56	23,30,58	28,37,51	26,36,52	19,44,72	28,36,79	
Gordeevskii R.											
Klintsovskii R.	1										
	76										
Novozybkovskii R.											
Zlynkovskii R.							1				
							235				
Krasnogorskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T26. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Klincy City	100 (6)[a]	93 (6)	47 (2)	16	10	16	8 (1)	11	9	5	
	24—215[b]	24—978	24—319	21—95	24—278	17—97	13—46	22—120	9—108	29—92	
	44,54,71[c]	39,52,67	34,46,72	29,39,45	28,39,56	29,38,57	22,32,43	26,31,62	39,45,60	52,72,89	
Gordeevskii R.		1									
		197									
Klintsovskii R.	1										
	752										
Novozybkovskii R.											
Zlynkovskii R.											
Krasnogorskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T27. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Klincy City		36 (2)[a]	74 (4)	117 (5)	132 (4)	145 (1)	126 (2)	104 (1)	115 (3)	207 (1)	197 (1)	2
		28–208[b]	18–209	20–199	19–1757	17–410	12–711	15–292	14–519	12–378	13–904	33–85
		33,38,46[c]	32,40,55	30,34,45	31,40,52	32,38,53	28,37,59	27,38,59	30,39,61	33,41,62	35,43,55	
Gordeevskii R.												
Klintsovskii R.		15 (1)	23	12	10	14	4	15	12	6	4	
		43–184	28–234	29–172	25–464	28–295	42–89	21–206	29–395	33–162	48–787	
		74,119,137	35,93,161	40,80,134	50,131,223	32,50,90	45,55,75	29,45,128	32,49,135	35,68,100	51,58,424	
Novozybkovskii R.			1									
			58									
Zlynkovskii R.												
Krasnogorskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T28. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Klincy City		36 (2)[a]	85 (4)	96 (4)	134 (5)	136 (10)	103 (1)	110 (3)	123 (1)	236	318 (2)	3
		22—217[b]	20—197	19—277	15—1765	10—361	14—1057	10—196	13—190	10—374	9—365	24—88
		33,41,51[c]	32,40,55	31,39,55	30,40,66	31,41,64	25,32,50	25,32,53	26,34,52	26,36,47	27,35,46	24,26,88
Gordeevskii R.												
Klintsovskii R.		15	12	16 (3)	14 (1)	14	13	9	9	13	4	
		28—239	25—223	27—234	30—435	25—240	27—163	22—244	38—210	37—148	54—220	
		75,99,161	67,88,160	33,101,144	45,134,187	37,104,164	59,92,130	42,120,127	76,110,144	48,83,99	56,70,151	
Novozybkovskii R.												
Zlynkovskii R.												
Krasnogorskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T29. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Klincy City	14 (3)[a]	170 (37)	280 (27)	338 (28)	338 (12)	352 (10)	403 (7)	394 (7)	348 (4)	120	32	
	26—73[b]	20—362	19—540	11—543	13—570	13—1255	11—1917	8—665	9—797	14—262	15—152	
	31,41,49[c]	33,41,66	30,40,57	28,37,55	31,39,58	28,40,63	28,41,61	28,39,68	31,42,66	33,43,71	29,42,79	
Gordeevskii R.												
Klintsovskii R.	1	39 (2)	44 (1)	48 (3)	43 (2)	45 (1)	55	57	34 (1)	41	22	
	36	24—202	23—234	16—242	16—144	16—108	18—122	12—197	11—404	17—232	21—103	
		31,38,47	31,36,46	31,38,54	29,40,52	25,34,44	26,36,50	26,35,46	33,42,58	32,41,53	27,36,39	
Novozybkovskii R.		55 (1)	110 (2)	128 (3)	100	115 (2)	104	130	107	29	22	
		28—764	32—899	19—710	29—1882	20—894	18—1962	12—1397	13—1027	29—1572	23—746	
		92,156,219	68,112,187	65,93,158	75,110,260	83,122,187	74,135,221	77,128,232	79,134,237	98,150,271	63,139,233	
Zlynkovskii R.												
Krasnogorskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T30. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Klincy City	13 (5)[a]	165 (26)	259 (26)	296 (33)	385 (17)	350 (14)	384 (7)	375 (4)	343 (2)	143	39 (1)	
	29—117[b]	20—546	18—587	16—1090	10—881	12—644	12—602	11—616	9—516	10—301	7—253	
	35,49,52[c]	32,40,55	29,37,54	30,40,62	29,42,62	28,38,56	28,39,58	26,36,54	25,33,51	26,35,50	32,51,92	
Gordeevskii R.												
Klintsovskii R.	1	39 (4)	41	33 (5)	51	41 (2)	42 (4)	39 (1)	37 (1)	25	15	
	46	22—234	25—99	18—97	15—423	11—154	15—277	10—109	13—105	14—98	15—58	
		28,35,51	31,36,46	33,41,51	29,37,53	23,33,39	25,33,51	22,29,43	26,31,37	28,34,46	25,28,36	
Novozybkovskii R.		64	98 (2)	106 (3)	123	116 (1)	104 (1)	103 (1)	107	37 (1)	36	1
		20—590	22—1227	18—932	15—597	22—1476	10—1778	12—935	17—1830	17—490	13—767	36
		63,102,213	64,94,166	75,121,203	63,104,169	61,123,243	62,87,184	65,107,205	59,120,202	42,128,181	58,89,178	
Zlynkovskii R.												
Krasnogorskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T31. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Klincy City	9 (1)[a]	101 (9)	97 (8)	62 (3)	82 (2)	51 (2)	73 (3)	57 (1)	44	2	2
	21—282[b]	11—238	16—496	18—362	11—356	16—350	9—548	10—166	16—532	11—81	23—79
	30,38,46[c]	30,45,69	32,53,85	33,51,99	31,42,72	32,54,105	31,43,85	31,45,66	30,48,62		
Gordeevskii R.		26	77	82 (1)	93 (1)	103	82	80	54 (3)	28 (1)	2
		45—678	41—550	22—435	36—438	18—468	53—956	40—491	27—1343	46—561	75—203
		112,152,238	139,199,295	120,173,244	110,194,270	116,161,250	120,200,271	120,195,287	95,139,215	119,192,269	
Klintsovskii R.									1		
									44		
Novozybkovskii R.		57 (2)	43 (3)	54	50 (1)	69	58	56 (1)	47	27	17
		16—447	28—425	23—328	16—534	16—589	22—283	9—930	13—615	24—1102	21—734
		45,79,122	44,58,141	43,65,107	37,53,104	37,55,86	40,68,108	45,68,110	49,84,142	44,85,146	56,103,179
Zlynkovskii R.	13	70 (5)	79 (4)	102 (1)	94	99	99	90	64 (1)	69	22 (1)
	28—661	26—764	18—1035	19—1145	15—1592	17—1035	20—617	20—837	25—772	13—1009	34—1110
	85,122,169	69,110,178	59,107,160	64,107,168	51,107,186	59,93,157	58,104,204	55,97,185	71,119,154	77,117,213	111,185,285
Krasnogorskii R.											1
											51

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected. [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one. [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T32. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Klincy City	4 (2)[a]	76 (14)	74 (8)	52	52 (4)	55 (3)	61 (4)	54 (3)	22 (1)	4	1 (1)
	23—48[b]	18—314	19—391	18—344	10—185	11—205	9—179	12—479	17—83	22—170	20
	28,33,41[c]	27,40,62	32,43,87	29,43,73	28,43,66	22,35,54	23,30,46	26,37,66	28,44,52	45,68,120	
Gordeevskii R.		34	76	89 (1)	86	73 (1)	80	76	63 (1)	71	3
		48—397	32—446	36—2290	46—883	23—750	18—1073	32—958	25—720	24—572	76—155
		76,150,216	103,161,233	135,197,268	117,176,243	103,167,238	88,154,259	93,165,257	80,115,239	71,107,162	76,99,155
Klintsovskii R.			1	1	1		1	1	1	4	1
			33	30	32		1044	29	112	23—180	112
										71,134,164	
Novozybkovskii R.		56 (2)	54	51 (1)	62	56 (1)	48 (2)	60 (1)	46	40 (1)	16
		23—456	21—347	24—318	19—442	17—566	15—287	10—274	13—479	17—393	19—321
		38,55,88	38,51,90	42,54,71	31,44,76	27,40,87	31,48,83	28,41,76	34,62,125	31,54,120	23,41,73
Zlynkovskii R.	13	99 (5)	96	102 (5)	98 (1)	107 (2)	86 (1)	78 (1)	82 (3)	78 (1)	23
	20—231	15—2055	24—1148	19—1849	22—1705	17—2135	20—1671	9—2423	11—889	21—2828	18—295
	105,150,178	71,110,174	63,108,156	68,110,154	68,117,183	49,103,172	53,97,235	57,99,206	41,102,192	73,120,205	38,78,180
Krasnogorskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T33. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Klincy City	6 (2)[a]	22 (2)	24 (1)	40 (1)	33 (1)	39	43 (3)	30	28	43 (1)
	24—67[b]	27—130	17—115	18—613	13—536	17—398	13—657	11—672	12—214	11—436
	26,36,55[c]	34,49,79	23,39,63	35,46,80	28,42,77	30,45,58	24,44,70	37,74,145	39,53,85	31,67,109
Gordeevskii R.		1	4	3	7	4	6	2	1	
		280	57—134	36—90	21—618	22—92	48—102	20—88	277	
			59,94,131	36,68,90	54,103,158	41,73,89	55,61,83			
Klintsovskii R.		7	9	9	8	7	9	14	5	7
		30—149	30—280	26—141	33—327	52—411	47—438	20—539	60—157	33—188
		42,63,105	41,74,96	54,111,125	70,95,134	90,102,124	92,134,187	79,127,194	70,87,156	72,81,162
Novozybkovskii R.										
Zlynkovskii R.										
Krasnogorskii R.		47 (4)	45 (2)	53 (4)	44 (1)	64	29	34	22	4
		18—1298	16—701	14—537	13—739	14—514	11—236	11—145	25—423	79—189
		39,76,101	46,90,129	50,72,139	39,71,162	39,66,110	45,74,104	38,75,86	66,96,161	118,161,177

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T34. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Klincy City	4	27 (4)[a]	29 (1)	21 (3)	26 (1)	25 (1)	35 (1)	58 (3)	44 (3)	100 (4)
	37—64	18—423[b]	22—215	18—192	16—398	15—165	11—112	12—772	10—203	10—365
	39,44,55	28,36,44[c]	32,42,50	30,49,70	21,34,48	24,34,39	20,28,42	24,40,50	23,36,52	27,42,76
Gordeevskii R.		4	8	5	5	1	3	3	2	
		28—132	25—179	39—296	98—177	85	83—169	50—127	46—108	
		40,59,99	63,88,156	55,95,172	120,135,172		83,84,169	50,125,127		
Klintsovskii R.		2	4	7	5	9	8	10	12	10
		47—237	37—646	32—57	18—117	20—135	17—129	46—227	46—204	20—198
			50,66,357	39,49,54	51,55,78	43,67,72	48,61,76	49,117,154	54,72,111	45,70,86
Novozybkovskii R.										
Zlynkovskii R.										
Krasnogorskii R.		53 (5)	38 (3)	46 (2)	56 (1)	57 (2)	56 (2)	52 (1)	34 (1)	19 (1)
		20—235	22—425	16—438	13—439	12—436	12—586	11—237	15—176	15—137
		48,63,82	48,68,123	38,58,114	34,68,116	50,65,102	45,67,124	45,69,107	41,64,112	56,93,120

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T35. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Boys. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Klincy City	3	6	7	11	5	1	1	1	
	18—47	16—37	12—118	16—109	12—101	37	103	27	
	18,27,47	19,26,31	21,49,80	26,34,63	17,46,47				
Gordeevskii R.									
Klintsovskii R.				1		1		1	
				42		75		36	
Novozybkovskii R.									
Zlynkovskii R.									
Krasnogorskii R.	1	71 (2)[a]	57	74	85	61	25	1	
	80	26—306[b]	20—256	19—381	12—244	16—239	17—156	50	
		43,64,96[c]	45,67,83	43,64,90	39,53,74	43,59,81	49,71,97		

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T36. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Bryansk region, Russian Federation. Girls. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Klincy City	5 (1)[a]	6	5	2 (1)	3 (1)	4	2	2	
	23—76[b]	16—45	23—283	47—58	14—56	22—111	19—72	17—54	
	27,31,55[c]	19,22,24	38,55,85		14,28,56	23,28,71			
Gordeevskii R.									
Klintsovskii R.					2	1			
					33—55	83			
Novozybkovskii R.									
Zlynkovskii R.									
Krasnogorskii R.	1	76	74	73 (1)	61	44	16	3	
	30	19—314	17—238	19—281	12—179	15—224	16—350	40—162	
		43,59,88	43,55,86	32,53,89	31,51,82	39,55,84	28,52,85	40,50,162	

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T37. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys. Examined in 1991.

Place of residence	Age (years) at the time of examination									
	5	6	7	8	9	10	11	12	13	14	15
Kiev City		1									
		29									
Polesskii R.	2 (1)	11 (1)[a]	24	17 (2)	22 (2)	19	1	4	1	1	
	45–142	41–209[b]	26–225	28–98	39–148	23–279	48	101–113	22	47	
		53,61,117[c]	45,56,73	34,42,82	52,61,76	30,48,76		101,103,110			
Ivankovskii R.	7 (2)	31 (22)	31 (13)	37 (10)	39 (8)	28 (4)	29 (4)	15	9 (1)	1	2
	26–121	20–133	25–52	23–136	19–91	17–111	19–145	16–151	16–238	18	22–38
	35,42,57	31,40,47	33,43,52	29,38,47	24,37,49	24,34,42	27,39,70	22,34,59	29,45,59		
Borodyanskii R.	2 (1)	11 (5)	5 (4)	12 (4)	13	15 (2)		1			
	35–41	27–41	22–44	22–78	17–85	10–62		19			
		29,34,35	33,42,42	30,34,43	24,31,33	22,24,35					
Vishgorodskii R.	2	4 (1)	6	7 (1)	7 (1)	9 (3)	26 (2)	6 (3)	8 (2)	4	4
	40–72	45–90	22–101	21–64	14–214	18–84	18–262	20–67	40–111	39–101	19–67
		58,71,81	26,32,50	28,40,57	24,29,94	22,30,63	26,35,47	22,29,34	43,45,50	40,41,71	24,34,53
Irpenskii R.									1		
									23		
K. Svyatoshinskii R.											
Makarovskii R.	4 (2)	11 (3)	11 (6)	18 (5)	15 (5)	15 (2)	10 (1)	6	2	1 (1)	
	31–79	28–60	15–169	21–63	14–73	15–51	16–50	13–39	14–23	30	
	36,42,60	35,45,56	25,31,50	24,28,43	23,32,38	22,30,41	24,27,31	15,28,33			

(cont.)

A48-T37. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Brovarskii R.											
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.											
Obukhovskii R.											
Belotserkovskii R.											
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T38. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Kiev City				(1)	(1)						
Polesskii R.	3 (1)[a]	7 (4)	22 (3)	24 (2)	29 (1)	16	1 (1)	1		4 (1)	
	33–58[b]	42–110	34–159	19–326	26–203	22–177	76	44		11–21	
	33,38,58[c]	49,69,108	50,71,84	48,58,82	41,49,77	54,57,69				15,19,20	
Ivankovskii R.	2 (2)	42 (15)	24 (8)	21 (11)	40 (10)	35 (10)	26 (2)	7 (2)	3	4 (1)	2
	31–60	19–109	23–88	23–78	19–187	15–331	18–61	20–44	16–23	21–41	14–35
		31,41,61	37,42,57	28,35,46	28,36,50	25,35,49	23,30,36	26,31,44	16,23,23	26,35,40	
Borodyanskii R.	5	7 (4)	13 (4)	8 (3)	21 (3)	10 (2)	6		1		
	32–74	20–60	26–70	24–58	17–64	12–56	15–36		41		
	35,35,48	28,31,38	32,39,42	28,32,54	23,30,35	15,30,35	18,20,25				
Vishgorodskii R.	(1)	4 (2)	12 (1)	7 (3)	7 (2)	12 (7)	11 (7)	5	10 (2)	6 (2)	5
		27–128	27–124	22–67	26–103	14–63	13–61	13–55	20–115	26–62	26–189
		33,56,102	39,49,63	26,41,47	29,42,48	22,29,51	15,22,44	20,21,30	22,34,49	28,37,48	36,44,61
Irpenskii R.											
K. Svyatoshinskii R.											
Makarovskii R.	3 (2)	12 (6)	15 (9)	21 (2)	12 (10)	18 (2)	8 (7)	5	2 (1)	1	1
	52–110	22–185	22–140	20–156	25–100	15–142	18–162	12–26	15–22	36	22
	52,70,110	30,39,57	31,61,78	29,45,54	33,42,59	21,29,39	20,27,84	16,18,25			

(cont.)

A48-T38. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Brovarskii R.											
Vasilkovskii R.											
Fastovskii R.											
Zgurovskii R.											
Baryshevskii R.											
Borispolskii R.											
Obukhovskii R.											
Belotserkovskii R.											
Skvirskii R.											
Yagotinskii R.											
P. Khmelnitskii R.											
Kagarlytskii R.											
Rakitnyanskii R.											
Volodarskii R.											
Mironovskii R.											
Boguslavskii R.											
Taraschanskii R.											
Stavischenskii R.											
Tetievskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T39. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Kiev City				(3)	(2)		(1)	(2)	(2)			(1)
Polesskii R.		3	25 (1)[a]	31	37 (1)	35 (2)	31 (1)	22	32 (1)	26 (1)	18 (1)	14 (1)
		24—43	28—124[b]	19—206	18—366	28—670	19—83	22—135	12—253	15—339	21—156	42—269
		24,28,43	47,65,103[c]	38,66,93	37,56,68	43,56,88	27,43,59	35,45,68	25,45,68	31,42,101	47,60,76	89,124,171
Ivankovskii R.		4 (2)	8 (3)	12 (5)	15	11	13 (1)	5	4	9	5	4
		27—55	22—89	25—242	8—154	19—208	14—228	14—51	22—40	23—113	19—57	17—55
		28,34,48	30,41,77	32,40,77	24,31,64	23,32,68	30,49,95	22,29,33	24,32,39	25,31,44	24,29,43	22,32,46
Borodyanskii R.		3 (1)	11 (9)	8 (1)	9 (4)	3 (3)	9 (5)	11 (1)	5 (1)	4 (1)	1	2
		23—39	20—80	21—51	20—44	25—33	20—64	15—233	15—36	18—62	20	25—28
		23,26,39	25,29,55	27,29,39	24,28,36	25,28,33	23,35,41	19,39,71	18,21,35	20,31,51		
Vishgorodskii R.		7	22 (12)	18	27 (2)	17	14	18 (3)	17 (1)	22	10	
		40—1447	22—237	26—599	11—376	21—75	28—93	20—176	23—345	18—552	15—531	
		69,113,175	39,80,106	37,52,113	40,47,63	38,45,55	33,54,75	27,46,78	40,51,71	31,52,79	35,48,77	
Irpenskii R.		(1)	(38)	(24)	1 (18)	2 (13)	2 (7)	(5)	2 (9)	2 (4)	(9)	(1)
					20	29—33	16—24		11—18	12—16		
K. Svyatoshinskii R.					(1)							
Makarovskii R.		(7)	3 (24)	7 (22)	5 (11)	12 (13)	7 (2)	7 (8)	9 (3)	4 (7)	4	
			23—148	19—34	19—54	16—41	17—34	16—44	15—39	18—22	12—28	
			23,25,148	26,27,31	20,25,30	17,20,26	19,25,28	16,28,39	22,26,29	18,20,21	13,15,21	

(cont.)

A48-T39. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Brovarskii R.												
Vasilkovskii R.												
Fastovskii R.												
Zgurovskii R.												
Baryshevskii R.												
Borispolskii R.												
Obukhovskii R.												
Belotserkovskii R.												
Skvirskii R.												
Yagotinskii R.												
P. Khmelnitskii R.												
Kagarlytskii R.												
Rakitnyanskii R.												
Volodarskii R.												
Mironovskii R.												
Boguslavskii R.												
Taraschanskii R.												
Stavischenskii R.												
Tetievskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T40. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Kiev City			(1)	(1)	(1)	(2)	(3)	(3)		(1)	1 (1)	(1)
											36	
Polesskii R.		9	17 (3)[a]	25 (1)	34	37 (1)	37	20 (3)	44	26 (1)	11	16
		34–88	31–100[b]	21–200	22–122	15–383	15–227	11–132	10–3240	12–134	12–711	34–147
		47,55,59	45,49,87[c]	37,60,79	37,49,67	35,50,77	32,45,80	24,30,36	21,39,92	29,40,52	31,86,164	50,70,110
Ivankovskii R.		1 (4)	17 (5)	12 (1)	17 (4)	9	9	11	13 (2)	2 (2)	5	1
		50	25–249	17–64	15–94	21–132	19–97	11–41	18–104	31–35	10–207	51
			37,42,64	23,34,53	32,43,51	29,44,50	25,32,48	24,28,34	29,38,47		19,28,57	
Borodyanskii R.		1 (1)	13 (14)	5 (9)	6 (4)	7 (6)	5 (3)	11 (1)	7 (4)	5 (1)	1	1 (1)
		22	21–139	22–46	17–67	15–75	17–95	14–151	12–72	12–176	21	19
			28,31,39	26,31,44	19,43,62	17,28,49	17,33,51	17,23,32	13,24,48	26,38,67		
Vishgorodskii R.		1 (1)	19 (14)	22	17 (1)	26	16 (1)	23	22	18	17	
		105	21–134	21–298	27–130	18–384	16–578	21–113	15–244	14–218	15–262	
			34,54,65	33,52,63	33,51,78	39,52,81	39,64,89	35,52,60	41,59,83	34,56,121	22,37,70	
Irpenskii R.		(3)	1 (31)	1 (32)	1 (10)	1 (18)	(16)	(25)	3 (27)	2 (8)	1 (17)	1 (5)
			32	32	22	24			12–15	13–24	11	13
									12,14,15			
K. Svyatoshinskii R.								(1)		(1)	(1)	
Makarovskii R.		(3)	4 (18)	7 (17)	7 (18)	6 (16)	6 (15)	5 (9)	5 (4)	7 (10)	6 (4)	
			12–29	20–37	14–45	18–30	13–46	20–31	13–90	11–39	11–28	
			15,24,29	21,24,32	19,22,25	18,22,26	16,17,19	20,20,21	16,18,22	13,18,26	16,18,22	

(cont.)

A48-T40. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Brovarskii R.												
Vasilkovskii R.												
Fastovskii R.												
Zgurovskii R.												
Baryshevskii R.												
Borispolskii R.												
Obukhovskii R.												
Belotserkovskii R.			1									
			53									
Skvirskii R.												
Yagotinskii R.												
P. Khmelnitskii R.												
Kagarlytskii R.										(1)		
Rakitnyanskii R.												
Volodarskii R.												
Mironovskii R.												
Boguslavskii R.												
Taraschanskii R.												
Stavischenskii R.												
Tetievskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T41. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Kiev City		(7)	1 (20) 19	2 (19) 29—35	3 (18)[a] 16—29[b] 16,19,29[c]	4 (19) 14—20 15,16,19	3 (14) 14—15 14,14,15	3 (15) 15—21 15,19,21	5 (13) 11—41 14,15,16	2 (4) 11—24	3 (6) 11—14 11,13,14	
Polesskii R.		3 24—50 24,47,50	10 (2) 25—94 27,32,57									
Ivankovskii R.										(1)		
Borodyanskii R.								(1)	1 15		1 97	
Vishgorodskii R.		5 (36) 22—54 26,33,37	(12)	(9)	2 (15) 10—142	5 (9) 15—19 17,17,17	(12)	3 (27) 11—15 11,14,15	3 (35) 11—76 11,22,76	2 (24) 15—21	2 (14) 14—15	1 (8) 97
Irpenskii R.	(2)	5 (22) 21—48 31,35,38	14 (27) 23—44 26,30,40	5 (24) 21—96 24,25,36	11 (21) 18—153 23,38,53	14 (13) 16—39 20,24,32	4 (6) 21—48 21,34,47	14 (20) 10—69 15,21,28	7 (9) 16—51 16,17,24	10 (8) 11—43 13,14,21	1 (3) 12	2 10—13
K. Svyatoshinskii R.		(7)	5 (55) 19—90 21,31,70	4 (25) 19—77 22,27,53	2 (32) 19—32	2 (35) 19—21	4 (16) 11—63 14,19,42	6 (34) 13—28 15,17,25	19 (56) 10—19 12,13,14	29 (128) 10—24 11,12,14	4 (23) 12—18 13,15,17	2 (8) 12—13
Makarovskii R.		(2)	7 (3) 16—48 22,32,37	8 (5) 17—45 25,33,35	5 (6) 14—41 18,26,29	14 (8) 16—40 19,21,29	4 (9) 22—39 23,26,33	9 (10) 14—36 20,25,29	8 (8) 10—93 11,17,27	11 (4) 10—33 12,15,30	7 (5) 11—35 11,26,31	
Brovarskii R.		1 (16) 26	2 (38) 12—21	5 (43) 15—26 19,19,20	11 (63) 18—24 20,20,21	7 (43) 12—74 14,18,27	11 (51) 11—40 14,16,16	18 (46) 11—20 12,14,17	21 (40) 10—22 12,14,15	15 (31) 9—19 11,13,18	7 (8) 11—22 11,14,21	1 (8) 23
Vasilkovskii R.			2 (34) 21—22	2 (32) 11—48	2 (27) 22—28	6 (29) 14—40 17,24,32	6 (22) 19—297 21,28,46	6 (20) 12—19 12,14,19	6 (21) 12—128 12,15,21	7 (17) 11—60 11,20,51	2 (10) 14—15	5 (8) 11—17 12,12,14
Fastovskii R.			4 (12) 19—27 21,25,27	9 (8) 14—28 21,23,24	11 (17) 13—37 16,20,25	14 (11) 17—47 20,22,24	12 (21) 13—32 16,19,23	12 (16) 14—30 17,20,23	18 (13) 12—36 19,21,26	15 (13) 14—45 16,19,28	9 (2) 13—36 18,23,26	2 16—29

(cont.)

A48-T41. Continued.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Zgurovskii R.								(1)				
Baryshevskii R.		2 (1)	2 (8)	2 (15)	6 (10)	5 (6)	8 (4)	12 (5)	6 (2)	2	1	
		18—26	27—27	20—31	14—38	11—26	21—39	12—140	18—33	16—31	18	
					18,19,34	22,23,25	24,28,36	20,30,38	18,21,27			
Borispolskii R.		(2)	1 (13)	7 (18)	4 (11)	3 (18)	1 (9)	5 (14)	8 (11)	5 (14)	4 (5)	
			14	24—248	18—27	27—199	18	12—34	11—1091	10—103	14—27	
				26,36,124	20,22,24	27,48,199		19,21,23	12,13,19	11,15,22	17,20,24	
Obukhovskii R.		1 (19)	3 (34)	6 (36)	2 (33)	5 (34)	1 (33)	4 (41)	6 (26)	8 (24)	3 (6)	1 (5)
		35	15—35	19—50	34—41	19—27	34	15—23	13—18	10—75	11—82	11
			15,21,35	21,23,32		20,22,23		15,18,22	14,16,18	11,14,20	11,12,82	
Belotserkovskii R.		5 (4)	3 (5)	6 (15)	20 (8)	16 (12)	21 (6)	9 (11)	16 (11)	14 (3)	3	
		28—63	21—89	22—38	14—61	17—82	14—38	11—63	12—39	11—44	11—23	
		40,51,55	21,68,89	24,33,38	19,22,27	21,28,38	19,21,25	15,23,30	17,22,32	20,29,37	11,12,23	
Skvirskii R.										1		
										24		
Yagotinskii R.												
P. Khmelnitskii R.												
Kagarlytskii R.		3 (2)	15 (18)	20 (17)	22 (21)	27 (31)	21 (18)	13 (10)	25 (20)	14 (12)	8 (16)	6 (11)
		25—28	17—73	19—210	17—74	10—85	15—249	14—46	10—39	12—105	11—23	12—65
		25,27,28	23,31,39	26,29,39	20,26,30	18,22,27	20,23,31	17,18,32	18,20,28	14,20,24	13,14,18	12,18,42
Rakitnyanskii R.												
Volodarskii R.												
Mironovskii R.				(1)								
Boguslavskii R.		(1)										
Taraschanskii R.												
Stavischenskii R.												
Tetievskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T42. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Kiev City		(13)	1 (22) 24	2 (28) 18—23	5 (22)[a] 16—41[b] 16,16,32[c]	5 (17) 12—26 16,16,25	3 (16) 14—25 14,14,25	2 (18) 23—26	5 (29) 12—21 14,15,20	5 (14) 13—26 13,15,25	(15)	(4)
Polesskii R.		(2)	3 (2) 45—172 45,112,172	(1)								
Ivankovskii R.									1 21	(1)	1 19	
Borodyanskii R.								(1)				1 29
Vishgorodskii R.		(34)	(11)	(21)	1 (8) 30	2 (8) 34—49	1 (15) 22	3 (33) 11—16 11,12,16	6 (25) 12—36 12,15,24	(31)	2 (28) 13—22	1 (12) 14
Irpenskii R.	(3)	9 (11) 22—42 30,32,40	20 (19) 21—67 26,35,44	10 (19) 21—90 25,34,46	11 (22) 19—76 23,30,56	9 (10) 17—44 20,31,36	11 (16) 12—178 27,30,55	6 (14) 12—47 14,36,46	6 (8) 14—38 18,20,32	2 (7) 13—34	6 (2) 13—27 15,18,22	1 12
K. Svyatoshinskii R.		(6)	1 (53) 24	1 (34) 22	1 (40) 44	3 (30) 13—15 13,14,15	7 (43) 11—32 12,16,21	4 (40) 11—23 12,14,19	10 (54) 11—45 13,14,17	17 (122) 9—132 11,12,14	3 (35) 10—12 10,11,12	1 (10) 15
Makarovskii R.		1 (4) 25	8 (7) 26—39 26,27,35	13 (11) 19—64 24,27,33	4 (11) 21—131 23,27,80	9 (15) 12—34 17,25,33	13 (11) 14—47 20,25,31	16 (14) 10—36 17,21,26	12 (14) 12—46 15,19,33	18 (12) 13—44 19,25,29	6 (7) 13—41 15,26,41	2 (2) 15—21
Brovarskii R.	1 16	1 (18) 25	1 (46) 21	2 (45) 16—24	5 (55) 17—19 17,18,19	6 (59) 17—26 17,19,20	5 (50) 14—23 14,15,21	10 (41) 12—21 14,15,19	22 (40) 9—30 11,14,16	15 (39) 9—20 11,13,15	4 (21) 11—21 11,11,16	1 (13) 19
Vasilkovskii R.			3 (26) 18—42 18,23,42	(35)	5 (27) 17—21 17,19,20	5 (22) 16—85 17,20,24	6 (29) 12—24 14,17,23	9 (28) 14—30 16,17,27	6 (28) 13—36 13,18,23	4 (22) 13—62 15,17,40	3 (20) 12—35 12,18,35	2 (16) 10—18
Fastovskii R.			5 (7) 23—32 24,26,28	9 (22) 19—29 20,23,25	24 (21) 16—332 20,24,27	28 (21) 13—45 18,21,27	25 (22) 14—45 16,17,25	32 (25) 14—82 16,20,27	28 (41) 14—62 17,20,29	24 (29) 10—34 15,19,24	9 (6) 17—30 20,26,27	11 (4) 13—26 13,17,23

(cont.)

A48-T42. Continued

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Zgurovskii R.					(1)							
Baryshevskii R.			4 (6)	3 (4)	3 (4)	4 (2)	14 (3)	4 (8)	6 (5)		1	
			16—66	24—117	24—45	29—47	12—40	17—34	14—50		32	
			23,33,51	24,33,117	24,38,45	30,31,39	16,25,35	19,21,27	14,22,24			
Borispolskii R.			5 (11)	2 (15)	3 (15)	6 (11)	5 (5)	3 (9)	7 (11)	4 (10)	2 (5)	2 (2)
			18—471	18—21	18—22	14—21	13—132	20—180	12—39	10—21	11—20	12—549
			20,34,72		18,20,22	16,18,20	14,17,22	20,24,180	15,18,19	11,16,21		
Obukhovskii R.		1 (12)	2 (43)	2 (33)	4 (32)	3 (31)	6 (31)	1 (24)	4 (26)	5 (31)	7 (18)	1 (5)
		32	26—32	22—40	23—46	12—26	11—37	15	13—14	12—71	9—15	9
					24,27,38	12,24,26	14,15,34		13,13,14	13,15,22	10,12,15	
Belotserkovskii R.		7 (9)	13 (14)	23 (16)	6 (8)	14 (7)	14 (10)	13 (6)	12 (9)	9 (5)	1 (1)	
		26—69	15—68	16—63	16—57	11—51	16—85	10—50	11—43	9—34	12	
		26,45,57	26,32,49	24,29,45	19,21,41	22,25,31	22,30,36	20,25,31	13,17,25	18,22,26		
Skvirskii R.						1		(1)	1			
						19			20			
Yagotinskii R.												
P. Khmelnitskii R.												
Kagarlytskii R.		3 (2)	12 (15)	24 (15)	25 (29)	28 (24)	19 (33)	29 (30)	24 (28)	19 (19)	14 (27)	9 (14)
		21—68	13—35	18—46	16—58	15—76	16—57	12—48	12—49	12—38	12—68	12—39
		21,23,68	21,24,29	22,26,32	19,24,29	22,26,39	18,21,33	17,20,28	15,20,28	14,16,23	16,25,37	13,15,19
Rakitnyanskii R.												
Volodarskii R.												
Mironovskii R.		(1)										
Boguslavskii R.												
Taraschanskii R.									(1)			
Stavischenskii R.											(1)	
Tetievskii R.												(1)

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T43. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Kiev City	(1)	5 (14)[a] 17–36[b] 22,25,29[c]	4 (14) 21–25 23,24,25	1 (13) 17	5 (20) 18–24 18,23,23	7 (13) 13–26 15,20,25	4 (13) 13–14 13,14,14	8 (5) 13–40 14,18,24	(3)	3 (1) 11–26 11,15,26	(1)
Polesskii R.											
Ivankovskii R.		1 (19) 36	2 (14) 24–55	(13)	4 (11) 22–47 23,29,41	7 (18) 23–45 35,40,44	29 (9) 17–147 26,41,57	42 (15) 15–176 23,34,49	28 (9) 16–163 27,38,45	8 (5) 21–108 30,47,67	1 145
Borodyanskii R.		23 (42) 17–376 23,28,38	55 (54) 16–471 24,30,38	51 (99) 11–120 23,31,44	60 (68) 15–262 21,34,43	55 (35) 11–230 18,27,40	55 (43) 10–145 17,21,31	53 (32) 10–112 18,24,39	22 (17) 11–105 16,25,40	13 (5) 12–31 15,19,26	1 15
Vishgorodskii R.	1 (10) 29	39 (63) 15–69 21,26,33	30 (59) 14–173 23,26,36	50 (68) 15–69 20,25,35	47 (48) 12–72 20,27,35	46 (49) 11–118 16,23,35	62 (45) 10–73 15,19,26	53 (51) 10–221 15,17,28	28 (26) 11–51 15,19,26	32 (18) 11–101 14,19,28	7 (4) 11–40 13,26,35
Irpenskii R.	(2)	7 (38) 14–34 19,27,33	9 (37) 18–42 20,24,30	9 (36) 17–35 21,29,31	9 (62) 14–53 15,19,23	27 (54) 11–192 17,19,22	17 (68) 11–39 11,14,22	45 (101) 11–46 14,17,27	23 (30) 11–110 14,16,21	18 (25) 10–49 14,16,22	1 (4) 38
K. Svyatoshinskii R.		(4)	8 (24) 18–146 21,26,40	2 (12) 29–31	8 (14) 13–23 14,16,21	4 (38) 12–26 12,19,26	9 (15) 11–35 14,15,17	5 (11) 12–19 13,14,16	11 (20) 11–27 12,14,25	(3)	(1)
Makarovskii R.											
Brovarskii R.		3 (34) 18–25 18,20,25	7 (32) 18–22 18,19,22	17 (28) 16–28 18,19,23	15 (20) 13–47 19,23,26	10 (16) 12–65 15,16,33	7 (16) 12–26 15,18,22	7 (10) 12–18 12,13,18	3 (12) 22–45 22,25,45	3 (2) 15–21 15,16,21	4 (1) 12–18 13,15,17
Vasilkovskii R.							1 20				
Fastovskii R.			1 (2) 32	(1)	1 (1) 36	(1)	1 (1) 33	(1)			
Zgurovskii R.											

(cont.)

A48-T43. Continued

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Baryshevskii R.	1 (2) 26	(1)	1 (3) 24	1 (2) 24	4 (4) 16—23 19,21,22	2 (4) 24—32	2 (2) 16—50	2 (2) 11—16	(1)		
Borispolskii R.			(5)	(1)	1 (1) 37		1 (1) 16	1 (1) 23			
Obukhovskii R.		(2)	1 (1) 29	(2)	1 (1) 26	(2)	1 16				
Belotserkovskii R.		1 48	(1)	5 (1) 19—36 20,23,25	3 14—34 14,23,34	(3)	1 22		1 (2) 23	5 (2) 12—21 15,15,18	
Skvirskii R.							1 (1) 18				
Yagotinskii R.						1 14		1 20			
P. Khmelnitskii R.		(1)		(2)	(1)		(1)	(1)	1 (1) 30		(1)
Kagarlytskii R.			(1)								
Rakitnyanskii R.	4 (13) 19—32 19,21,27	23 (38) 18—64 21,26,36	35 (40) 17—51 20,25,32	34 (30) 14—45 22,26,32	33 (34) 13—76 19,21,28	26 (29) 12—60 15,18,21	23 (32) 9—34 15,17,22	26 (34) 11—37 16,18,21	30 (10) 13—50 15,17,22	10 (4) 12—28 13,15,23	6 (3) 13—25 14,15,19
Volodarskii R.											
Mironovskii R.			(2)	(1)	(1)	1 (1) 26	1 23	1 16			
Boguslavskii R.				(1)				1 22			
Taraschanskii R.								(1)	(1)		
Stavischenskii R.		8 (14) 20—42 23,31,35	19 (10) 17—55 29,38,40	23 (20) 16—173 20,25,42	12 (11) 15—44 18,21,27	25 (17) 14—176 18,23,38	28 (34) 13—117 17,23,29	30 (28) 12—36 14,18,24	17 (19) 12—98 14,20,26	13 (13) 10—37 13,16,22	1 16
Tetievskii R.						(1)					(1)

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T44. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Kiev City	(3)	1 (8)	1 (12)	4 (18)[a]	6 (19)	3 (21)	6 (19)	5 (8)	2 (4)	(1)	1
		18	32	15—53[b]	17—89	16—22	13—56	13—24	15—20		14
				16,20,37[c]	21,23,46	16,22,22	14,15,22	13,14,16			
Polesskii R.											
Ivankovskii R.		3 (14)	2 (13)	1 (12)	6 (14)	4 (9)	30 (4)	50 (13)	33 (17)	9 (9)	1 (1)
		24—42	39—58	67	19—53	26—54	17—190	11—98	20—114	22—61	56
		24,31,42			25,28,34	37,51,54	31,44,79	26,35,48	32,41,48	29,38,42	
Borodyanskii R.		30 (46)	46 (59)	45 (85)	53 (61)	55 (57)	51 (35)	47 (61)	42 (23)	8 (8)	1 (3)
		20—99	17—72	14—214	13—114	10—85	13—141	12—126	12—94	15—57	18
		25,31,37	24,30,39	21,25,33	19,26,39	18,23,30	18,24,28	16,21,28	16,22,30	22,26,33	
Vishgorodskii R.	1 (10)	20 (63)	33 (62)	28 (70)	36 (45)	49 (55)	56 (64)	45 (52)	34 (39)	20 (23)	7 (13)
	27	20—146	13—62	14—53	12—102	12—76	10—69	10—198	9—84	10—41	12—46
		23,25,39	22,24,31	18,23,28	18,21,29	17,21,26	14,17,25	15,21,35	13,20,30	12,15,21	13,15,23
Irpenskii R.		8 (39)	10 (41)	8 (52)	7 (47)	23 (80)	18 (95)	33 (114)	25 (56)	25 (53)	8 (9)
		20—27	15—41	17—48	14—33	10—144	11—122	11—52	10—29	12—64	10—95
		22,23,24	20,25,29	20,24,27	15,17,32	17,20,30	13,16,26	14,16,20	13,14,19	14,16,17	12,16,56
K. Svyatoshinskii R.	(1)	(1)	7 (27)	(9)	4 (16)	6 (32)	23 (15)	16 (9)	15 (27)	(5)	(1)
			19—25		17—32	13—23	11—30	11—30	11—22		
			19,21,23		18,23,30	14,15,19	14,16,22	13,18,23	13,15,18		
Makarovskii R.			(1)	(1)	(1)						
Brovarskii R.		11 (28)	11 (37)	10 (27)	10 (20)	11 (15)	11 (23)	10 (15)	4 (4)	4 (5)	5 (2)
		21—36	14—73	13—39	13—36	14—79	12—29	13—94	10—20	11—15	10—17
		22,25,29	20,25,28	15,21,29	16,18,21	16,19,34	12,15,26	13,16,37	10,14,18	11,11,13	11,11,11
Vasilkovskii R.		(1)		1	2						
				14	27—28						
Fastovskii R.		2 (1)		(1)	(1)	1		(1)	1		
		30—41				33			26		
Zgurovskii R.											
Baryshevskii R.		1 (1)	(3)	(5)	(2)	1 (2)	2 (2)	(1)	(1)	1	
		35				19	10—20			17	

(cont.)

A48-T44. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Borispolskii R.		(2)	2 (3) 19—30	1 (1) 29	2 (2) 21—33	2 (1) 19—20	(1)	(1)			
Obukhovskii R.		(1)			(2)	(1)			1 12		
Belotserkovskii R.		(1)	1 (5) 19	2 (2) 23—25	1 (3) 18		1 (1) 14	3 13—14 13,14,14	1 (1) 25	2 12—14	
Skvirskii R.		(1)		(1)			1 28				
Yagotinskii R.		(1)	(1)	1 (1) 30					1 23		(1)
P. Khmelnitskii R.					(1)		2 23—25	(3)			
Kagarlytskii R.				1 30		1 14		(2)			
Rakitnyanskii R.	5 (8) 21—25 23,23,25	28 (39) 15—149 23,27,35	32 (57) 16—427 22,27,37	31 (35) 6—250 19,27,40	33 (40) 13—80 15,19,28	28 (38) 13—43 16,22,25	41 (36) 12—38 15,17,20	29 (31) 12—31 17,21,26	37 (14) 11—143 15,19,24	27 (10) 13—275 15,20,29	13 (1) 15—61 21,24,30
Volodarskii R.											
Mironovskii R.					3 12—19 12,16,19	2 (1) 17—25	3 (1) 16—22 16,18,22	(1)			
Boguslavskii R.		(1)				1 (1) 19	1 15	1 19			
Taraschanskii R.			(1)			(1)	1 27	1 12			
Stavischenskii R.		14 (13) 24—133 32,41,44	18 (24) 19—55 25,30,39	24 (17) 16—113 23,30,40	25 (7) 17—103 21,27,35	25 (7) 11—47 17,23,28	24 (32) 11—54 16,20,33	30 (36) 12—219 17,20,33	23 (33) 12—44 17,25,32	23 (27) 12—38 14,18,25	3 (2) 14—33 14,21,33
Tetievskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T45. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Kiev City		1 (7) 34	5 (11)[a] 17—23[b] 19,19,22[c]	2 (8) 24—29	(4)	3 (1) 17—33 17,32,33	1 (4) 18			
Polesskii R.										
Ivankovskii R.							1 37			
Borodyanskii R.			(1)						1 28	
Vishgorodskii R.							1 21	1 23		
Irpenskii R.	(13)	16 (99) 18—40 19,25,32	42 (163) 13—169 20,24,30	66 (134) 11—433 17,21,27	66 (148) 12—180 18,21,26	64 (109) 13—195 18,23,32	93 (99) 13—84 18,22,33	39 (47) 12—179 18,28,40	20 (33) 12—33 17,20,24	1 (1) 17
K. Svyatoshinskii R.	(2)	19 (36) 14—45 20,24,28	42 (41) 14—50 20,26,30	50 (66) 14—53 19,23,27	41 (42) 14—47 21,26,32	33 (59) 13—126 18,21,25	62 (80) 13—45 16,19,25	36 (36) 14—50 17,22,35	31 (23) 12—225 17,20,33	3 (9) 17—27 17,27,27
Makarovskii R.			(2)	(1)	1 33	(1)				
Brovarskii R.		(1)	4 18—23 20,23,23	13 (1) 20—56 31,38,42	11 (2) 19—45 20,34,39	8 (4) 16—69 20,27,32	2 (6) 18—46	3 (9) 22—33 22,31,33	3 (7) 17—20 17,19,20	(4)
Vasilkovskii R.										
Fastovskii R.										
Zgurovskii R.										
Baryshevskii R.										
Borispolskii R.		2 (2) 26—40	3 16—42 16,19,42	(2)	2 (1) 23—30	(1)	1 30			

(cont.)

A48-T45. Continued.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Obukhovskii R.			1 (1) 27							
Belotserkovskii R.				1 44					(1)	
Skvirskii R.										
Yagotinskii R.										
P. Khmelnitskii R.										
Kagarlytskii R.										
Rakitnyanskii R.				1 14						
Volodarskii R.		27 (33) 16–53 23,29,37	45 (100) 16–51 26,29,34	40 (73) 16–52 21,24,31	49 (77) 16–57 22,26,33	21 (58) 16–54 23,30,36	13 (47) 15–154 18,19,31	4 (21) 17–33 18,21,27	2 (12) 16–22	
Mironovskii R.										
Boguslavskii R.		9 (6) 20–47 27,31,40	11 (11) 20–62 40,50,52	31 (6) 19–56 30,42,48	13 (14) 22–74 32,38,57	13 (12) 20–92 24,32,60	24 (13) 19–71 35,44,56	29 (6) 24–100 36,45,53	10 (8) 21–54 24,34,39	1 (6) 25
Taraschanskii R.		1 26								
Stavischenskii R.										
Tetievskii R.		4 (41) 27–54 30,36,47	3 (32) 24–41 24,33,41	3 (43) 20–23 20,21,23	2 (40) 17–24	1 (20) 15	1 (31) 28	(20)	(6)	(7)

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T46. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Kiev City		2 (10) 19—28	7 (9)[a] 22—34[b] 23,24,30[c]	2 (7) 17—19	(5)	1 (4) 29	1 (3) 25	(5)	3 (2) 18—24 18,21,24	1 18
Polesskii R.										
Ivankovskii R.	(1)	1 23	(1)		1 34					
Borodyanskii R.										
Vishgorodskii R.		(1)	2 (1) 21—24	(1)						
Irpenskii R.	1 (11) 23	7 (86) 19—109 21,26,29	35 (158) 17—159 21,22,26	67 (145) 13—149 19,21,27	62 (139) 12—68 18,20,24	57 (98) 14—62 16,20,24	53 (87) 13—98 17,23,28	38 (65) 14—55 17,19,28	25 (45) 14—108 18,24,39	2 22—28
K. Svyatoshinskii R.	1 (9) 21	14 (44) 18—38 20,27,31	46 (60) 14—79 19,23,27	45 (50) 14—47 20,25,32	54 (35) 13—79 18,24,32	33 (52) 13—44 16,19,26	39 (82) 13—38 17,20,25	36 (37) 14—92 16,22,29	37 (35) 14—94 18,24,30	18 (12) 13—30 17,20,23
Makarovskii R.		(1)	1 (1) 21							
Brovarskii R.			3 23—48 23,24,48	8 17—46 21,32,38	11 (2) 16—521 21,28,52	10 (7) 21—37 24,25,29	5 (11) 18—34 18,19,26	3 (14) 16—18 16,18,18	(12)	(2)
Vasilkovskii R.										
Fastovskii R.					2 (1) 21—23					(1)
Zgurovskii R.										
Baryshevskii R.										
Borispolskii R.		5 (2) 22—32 25,28,28	2 (2) 19—20	1 (3) 20		(1)	3 (1) 14—35 14,18,35			

(cont.)

A48-T46. Continued.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Obukhovskii R.			(2)						(1)	
Belotserkovskii R.					1 (1) 18					
Skvirskii R.			(1)							
Yagotinskii R.				(1)		(1)				
P. Khmelnitskii R.										
Kagarlytskii R.										
Rakitnyanskii R.			(2)							
Volodarskii R.		23 (43) 18—48 23,31,35	51 (97) 13—55 23,27,34	35 (87) 17—59 23,28,37	35 (90) 15—47 22,26,35	16 (78) 14—41 17,22,29	17 (90) 15—114 18,22,29	1 (52) 17	(26)	(2)
Mironovskii R.				(1)						
Boguslavskii R.		13 (2) 17—55 34,37,43	7 (6) 30—87 31,50,54	17 (18) 24—87 32,47,67	11 (16) 22—92 36,40,50	11 (13) 29—325 36,43,60	16 (14) 22—63 32,42,51	23 (7) 19—82 30,39,62	9 (8) 22—52 32,33,50	7 (8) 25—39 27,29,32
Taraschanskii R.				(1)		1 11				
Stavischenskii R.										
Tetievskii R.		5 (33) 19—45 20,21,26	2 (32) 30—45	10 (35) 15—37 19,23,28	4 (44) 16—47 21,29,39	3 (28) 20—26 20,21,26	5 (38) 16—39 17,23,25	1 (42) 28	3 (21) 16—33 16,20,33	2 (14) 217—19

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T47. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Boys. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Kiev City		2 (4) 24—32	1 (4) 18	2 (4) 22—25	3 (6)[a] 16—27[b] 16,20,27[c]	(7)	(1)	(1)	
Polesskii R.									
Ivankovskii R.									
Borodyanskii R.									
Vishgorodskii R.									
Irpenskii R.	9 (13) 19—29 22,23,27	33 (65) 17—47 21,23,30	38 (81) 17—82 19,25,37	55 (85) 16—1845 19,24,32	28 (72) 16—71 19,21,28	29 (57) 16—106 18,21,29	9 (19) 16—42 18,21,30	2 (10) 19—42	(1)
K. Svyatoshinskii R.		16 (25) 17—128 21,23,27	11 (46) 18—55 19,26,32	7 (35) 19—45 22,30,42	10 (29) 15—49 17,21,28	6 (31) 18—42 19,20,22	6 (20) 17—293 18,22,34	1 (12) 48	(2)
Makarovskii R.									
Brovarskii R.		(1)					1 27		
Vasilkovskii R.									
Fastovskii R.									(1)
Zgurovskii R.									
Baryshevskii R.		4 (8) 20—25 20,21,23	3 (2) 19—30 19,20,30	3 (5) 20—33 20,24,33	(6)	1 (4) 23	1 (6) 24	1 (1) 21	
Borispolskii R.								1 37	1 17
Obukhovskii R.									
Belotserkovskii R.									
Skvirskii R.									
Yagotinskii R.									(1)
P. Khmelnitskii R.									

(cont.)

A48-T47. Continued.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Kagarlytskii R.			1						
			24						
Rakitnyanskii R.									
Volodarskii R.									
Mironovskii R.									
Boguslavskii R.									
Taraschanskii R.									
Stavischenskii R.									
Tetievskii R.			(1)						1
									23

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T48. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Kiev region, Ukraine. Girls. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Kiev City		(4)	(4)	1 (5) 18	2 (2) 18—27	1 (8) 31	(3)	(3)	1 (1) 24
Polesskii R.									
Ivankovskii R.							(1)		
Borodyanskii R.	1 31					(1)			
Vishgorodskii R.						(1)			
Irpenskii R.	3 (19)[a] 18—27[b] 18,20,27[c]	30 (71) 17—157 21,25,33	53 (96) 17—119 19,21,27	26 (71) 14—39 18,21,29	30 (62) 17—125 18,23,31	31 (46) 13—59 18,21,31	9 (32) 15—304 17,21,24	(8)	(3)
K. Svyatoshinskii R.	(1)	11 (18) 17—40 18,21,28	16 (43) 17—67 22,27,31	7 (43) 19—27 20,25,26	5 (31) 18—759 22,28,33	2 (41) 17—20	4 (31) 18—30 20,23,28	3 (20) 23—29 23,23,29	2 (8) 17—21
Makarovskii R.				(1)		(1)			
Brovarskii R.					1 21				
Vasilkovskii R.									
Fastovskii R.	(1)								
Zgurovskii R.							(1)		
Baryshevskii R.		1 (8) 31	4 (3) 21—27 21,24,27	5 (7) 19—23 19,21,22	2 (2) 20—28	(5)	1 (1) 20	(1)	
Borispolskii R.				(1)		(1)			
Obukhovskii R.									1 22
Belotserkovskii R.					(1)				
Skvirskii R.									

(cont.)

A48-T48. Continued.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Yagotinskii R.		(1)	1						
			108						
P. Khmelnitskii R.									
Kagarlytskii R.					(1)		(1)		
Rakitnyanskii R.									
Volodarskii R.									
Mironovskii R.									
Boguslavskii R.									
Taraschanskii R.						(1)			
Stavischenskii R.									
Tetievskii R.				(1)					

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T49. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Korosten City	10 (2)[a]	25 (6)	16 (2)	6 (1)	7	17 (2)	17 (3)	7	2 (1)	2	
	26–164[b]	17–125	24–134	22–78	17–107	19–69	18–92	21–53	28–38	17–19	
	45,112,121[c]	32,50,99	30,32,69	26,37,60	27,35,57	27,29,36	28,35,48	24,31,46			
Ovruchskii R.		4 (3)	4 (1)	14 (7)	14 (4)	22 (7)	7 (4)	12 (3)	5 (2)	5 (2)	
		41–123	34–137	19–98	19–79	15–122	36–146	24–349	24–96	20–198	
		60,89,111	65,100,121	29,35,60	34,40,43	26,42,57	50,71,100	29,39,134	46,55,59	25,40,115	
Olevskii R.		2	2	8	9	7 (1)	11	1	7	3	
		67–103	58–165	38–344	49–475	28–318	60–225	45	28–747	107–371	
				74,94,178	70,99,172	80,93,142	69,104,156		36,63,78	107,265,371	
Narodichskii R.		1	2	2	6	4 (1)	1 (1)	4	4	1 (1)	3
		98	100–140	75–139	78–246	19–146	86	22–293	26–145	83	51–115
					80,104,147	27,64,119		23,69,204	41,76,120		51,98,115
Korostenskii R.		1	1	4 (1)	18 (1)	17 (3)	12 (1)	2	1		
		81	49	21–49	19–104	16–128	19–124	27–67	59		
				23,33,44	26,41,89	21,34,57	27,44,75				
Luginskii R.	3	7 (1)	3 (1)	9	4	5	5	8	8		
	39–77	26–112	60–105	34–170	58–126	43–184	59–155	43–190	46–253		
	39,60,77	27,36,59	60,75,105	51,87,104	78,103,117	114,151,175	72,74,77	78,102,143	76,100,159		
Emilchinskii R.			7 (2)	7	7 (3)	16 (3)	9 (2)	7	6	(1)	
			26–117	30–313	15–191	21–86	17–71	26–127	24–50		
			27,36,93	32,76,86	27,29,161	26,32,48	20,39,49	30,32,35	29,34,42		
Malinskii R.	(1)	(1)	(4)	7 (4)	5 (10)	8 (5)	7 (3)	1 (3)	1 (1)	(1)	(1)
				14–31	26–46	18–75	13–41	37	9		
				20,25,26	32,35,36	23,29,53	19,28,37				
V. Volinskii R.	1		(1)	1	(1)	(1)	1	1	2	2	
	46			44			45	41	44–49	49–50	

(cont.)

A48-T49. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
N. Volinskii R.	(1)		2	6 (2)	3 (5)	3 (3)	7 (2)	4 (1)	1	1	2
			42—107	34—120	20—131	20—45	16—215	25—49	17	66	25—65
				59,82,115	20,60,131	20,27,45	18,38,75	25,30,42			
Radomishliskii R.	(5)	1 (6)	(1)								
		54									
Brusilovskii R.					(1)						

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T50. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls. Examined in 1991.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
Korosten City	11 (2)[a]	27 (3)	8 (5)	10 (4)	10 (4)	12 (7)	5 (3)	9 (2)	5 (1)	4	(1)
	27—181[b]	16—119	21—92	22—119	14—154	14—176	12—29	11—36	15—29	13—49	
	58,105,125[c]	28,57,105	27,35,40	32,43,59	30,36,64	22,26,56	17,22,27	16,18,32	19,26,27	18,26,39	
Ovruchskii R.	4 (2)	5 (2)	7 (2)	21 (8)	17 (8)	20 (7)	12 (5)	12 (1)	19 (4)	7 (3)	3 (1)
	58—109	31—157	24—83	25—85	19—103	13—158	18—1000	15—175	13—415	37—365	17—188
	59,80,104	61,75,85	42,56,78	38,44,53	31,38,54	25,38,87	41,50,68	34,43,52	31,47,86	38,41,98	17,98,188
Olevskii R.		2	1	8	8	12 (2)	10	8	4	1	1
		97—210	290	42—145	15—160	48—398	20—186	57—99	56—241	131	67
				62,86,107	44,71,124	56,78,122	65,85,99	60,77,94	77,112,183		
Narodichskii R.	4	1	8	7	3 (1)	4 (1)	4 (2)	4	12 (1)	6	4
	32—88	59	48—216	46—495	35—258	20—171	56—114	54—97	19—207	40—190	36—84
	46,65,79		68,90,107	47,70,95	35,49,258	21,62,137	67,79,97	58,73,91	31,37,61	48,62,104	55,76,80
Korostenskii R.		1		5 (2)	18 (2)	19 (1)	7 (1)	2	1	1	1
		58		26—132	10—118	15—103	31—138	17—45	27	54	29
				36,53,89	28,41,83	22,29,49	33,45,94				
Luginskii R.	2	3	7	11 (1)	5	3	11	6	2		
	33—34	35—80	41—182	23—184	33—156	106—171	52—208	29—159	82—100		
		35,39,80	48,83,136	62,118,132	78,80,124	106,152,171	55,112,136	55,86,158			
Emilchinskii R.	1 (1)	3	6 (1)	7 (2)	13 (5)	35 (1)	21 (1)	7	13		1
	36	30—37	20—74	21—180	21—91	13—107	16—47	23—69	22—210		26
		30,31,37	22,30,56	23,32,133	28,40,43	23,26,38	21,28,36	24,29,50	32,38,55		
Malinskii R.		1 (3)	1	4 (6)	14 (8)	16 (12)	9 (5)	2	3		
		34	34	20—34	20—72	16—79	14—68	14—21	14—54		
				23,29,33	26,32,46	19,22,28	17,23,41		14,22,54		

(cont.)

A48-T50. Continued.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15
V. Volinskii R.			1 (1) 93		2 34—66		1 51	1 47	3 42—78 42,68,78	3 33—59 33,37,59	
N. Volinskii R.		(1)	(1)	4 (6) 25—58 26,34,49	5 (7) 22—37 22,23,24	11 (6) 18—82 23,29,55	7 14—166 16,35,142	8 (3) 14—41 16,24,30	6 (2) 22—104 32,40,72	6 19—43 20,26,40	2 16—60
Radomishliskii R.	(2)	(14)	(1)	(1)							
Brusilovskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of de-

A48-T51. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys. Examined in 1992.

Place of residence	Age (years) at the time of examination										
	5	6	7	8	9	10	11	12	13	14	15	16
Korosten City		1 (9)	20 (28)[a]	33 (33)	22 (31)	44 (19)	34 (24)	25 (19)	51 (20)	82 (22)	24 (6)	2
		52	20—167[b]	17—208	16—107	15—110	12—105	13—65	11—66	9—195	10—67	25—32
			26,33,49[c]	24,27,34	20,24,43	22,29,37	17,28,40	19,27,35	16,20,28	16,20,27	15,25,34	
Ovruchskii R.		7	4	5	8	4	8	2	3	7	2	
		30—320	44—133	37—257	42—627	44—204	44—533	177—266	62—114	68—233	115—167	
		49,74,170	45,55,98	52,52,167	59,76,257	61,80,143	54,114,240		62,70,114	70,81,126		
Olevskii R.				(1)	3	1	3	2	2	3	1	
					36—1049	56	62—181	78—120	17—43	31—231	278	
					36,94,1049		62,181,181			31,124,231		
Narodichskii R.		6 (3)	7	6 (3)	6	14 (2)	11 (2)	8 (1)	17	3	2 (1)	3
		60—101	30—218	21—374	27—580	21—263	28—138	51—147	32—260	18—196	31—97	44—55
		62,69,84	36,50,84	103,131,246	109,188,353	42,58,103	40,77,98	53,75,92	59,74,125	18,40,196		44,49,55
Korostenskii R.		3	11	12	19 (2)	21 (1)	18	15	18 (2)	25 (1)	11	18
		46—57	26—82	23—71	27—73	24—62	19—394	16—58	19—79	24—206	19—88	18—75
		46,51,57	31,35,46	48,54,58	36,50,64	32,39,44	30,38,44	23,28,39	27,39,51	36,44,51	40,52,66	26,42,54
Luginskii R.			4 (1)	24 (3)	28	8 (1)			2	7	17	13
			27—58	17—113	24—277	19—140			31—626	26—182	14—255	22—200
			32,40,51	25,33,59	36,62,109	31,40,72				35,49,97	43,61,123	30,39,81
Emilchinskii R.	2	9 (1)	10 (3)	13 (2)	18 (3)	12 (3)	14 (2)	12	11	8 (1)	3	3
	96—174	33—162	18—266	22—150	18—248	16—199	24—278	17—239	12—210	10—220	82—152	11—203
		54,62,80	28,45,78	31,47,58	27,36,63	25,35,75	28,60,83	25,27,68	20,33,47	23,33,115	82,151,152	11,30,203
Malinskii R.	(1)	2 (8)	8 (18)	18 (13)	9 (13)	6 (13)	9 (5)	11 (13)	7 (5)	4 (1)	(1)	2 (1)
		68—74	19—80	20—75	20—103	17—77	19—59	15—85	10—51	10—29		16—28
			27,36,46	25,34,45	29,36,43	20,27,34	20,24,34	19,22,26	19,31,47	17,25,28		

(cont.)

A48-T51. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
V. Volinskii R.		(7)	(26)	3 (33)	3 (42)	(36)	2 (31)	6 (27)	10 (27)	(4)		
				15—33	16—22		14—18	12—414	10—20			
				15,25,33	16,21,22			17,18,26	11,16,19			
N. Volinskii R.	1	3 (5)	8 (4)	13 (5)	9 (9)	16 (5)	16 (5)	11 (3)	14 (4)	13 (2)	(1)	(1)
	67	24—30	24—267	24—578	24—158	16—201	18—402	12—269	19—516	15—267		
		24,30,30	39,55,135	41,149,235	27,48,91	28,76,96	35,60,119	18,22,89	29,41,280	30,53,111		
Radomishliskii R.												
Brusilovskii R.	(2)	(5)	5 (8)	1 (11)	5 (8)	(13)	5 (10)	5 (18)	2 (11)	1 (11)	2 (4)	(1)
			25—309	225	26—156		14—74	19—86	32—79	45	24—391	
			65,72,165		30,116,120		24,25,67	20,27,56				

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T52. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls. Examined in 1992.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
Korosten City	(2)	2 (6)	9 (48)[a]	29 (43)	37 (38)	42 (30)	43 (27)	36 (23)	30 (33)	87 (59)	32 (8)	12 (8)
		20—21	17—139[b]	20—53	10—97	17—72	13—78	11—226	11—88	9—79	10—66	8—290
			21,31,33[c]	22,26,30	20,23,30	20,23,33	18,22,30	17,24,40	14,17,27	14,19,25	13,18,26	12,16,31
Ovruchskii R.			7 (1)	10	9	5	5	12	8	7	1	
			40—186	42—568	43—318	40—291	36—175	36—205	46—190	46—311	57	
			47,77,174	50,82,95	47,53,81	84,104,185	53,97,168	69,102,139	54,111,150	57,84,155		
Olevskii R.			1	2	1	2	1		5	4	2	
			25	114—154	184	36—106	67		72—649	24—165	60—193	
									76,91,207	35,89,149		
Narodichskii R.	1	1 (1)	7 (6)	14 (3)	11	15 (2)	15 (1)	15 (1)	10 (1)	16	3	1
	27	32	22—190	20—193	23—123	22—112	18—199	36—148	23—89	15—260	18—63	140
			41,56,120	46,60,84	26,47,90	33,48,81	25,60,85	47,65,126	34,37,51	29,52,68	18,26,63	
Korostenskii R.		10 (1)	19	10 (2)	16	22 (1)	13 (2)	3	17 (1)	25 (1)	17	11
		33—91	28—58	28—112	33—85	21—78	15—67	18—62	17—48	17—75	24—79	28—50
		42,45,58	33,43,51	31,43,55	37,45,52	28,33,41	19,32,39	18,39,62	31,34,38	31,41,50	40,42,47	29,36,48
Luginskii R.		(1)	4 (1)	29 (1)	33	9 (3)	3		2 (1)	11 (2)	25	8
			81—194	18—239	21—289	13—101	25—63		18—29	21—72	10—564	10—59
			109,161,189	31,42,59	33,43,55	40,54,73	25,30,63			34,48,64	20,29,51	29,41,51
Emilchinskii R.	(3)	4 (1)	12 (5)	14 (2)	17 (6)	19 (5)	14 (1)	21 (1)	20 (2)	7 (1)	2	1
		33—156	23—200	23—221	17—147	19—229	16—188	15—220	13—147	11—39	20—79	102
		36,46,104	32,40,58	29,54,105	23,36,49	23,35,66	26,35,46	21,34,88	18,26,62	15,29,33		
Malinskii R.	(1)	4 (10)	8 (24)	17 (16)	6 (12)	17 (18)	14 (17)	14 (14)	9 (16)	6 (8)	5	1 (1)
		23—61	20—51	18—119	21—69	16—123	15—110	11—63	10—37	14—41	19—61	13
		25,33,51	24,28,41	29,33,42	26,34,49	19,25,39	19,23,28	20,31,44	18,22,35	17,26,31	20,21,23	

(cont.)

A48-T52. Continued.

Place of residence	Age (years) at the time of examination											
	5	6	7	8	9	10	11	12	13	14	15	16
V. Volinskii R.		(2)	1 (13)	(34)	1 (52)	2 (29)	3 (36)	5 (25)	7 (41)	4 (19)	(2)	1
			28		17	19—21	14—32	14—28	13—27	10—23		18
							14,15,32	15,16,23	13,14,15	12,14,19		
N. Volinskii R.	1 (1)	2 (1)	8 (6)	12 (11)	15 (9)	9 (3)	14 (6)	17 (5)	14 (5)	21 (4)	7 (2)	2
	29	33—97	21—182	19—211	18—373	15—62	23—263	13—135	16—198	12—362	10—90	23—25
			29,51,128	29,86,117	30,41,88	21,22,28	25,47,84	21,38,47	19,32,39	21,31,56	14,32,41	
Radomishliskii R.												
Brusilovskii R.	1 (1)	2 (9)	3 (11)	2 (9)	2 (8)	3 (10)	1 (11)	7 (8)	1 (10)	1 (17)	(3)	1 (2)
	67	34—71	19—72	30—30	17—66	15—48	14	16—335	18	40		30
			19,26,72			15,32,48		20,55,206				

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T53. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Korosten City	1 (3)	22 (44)[a]	38 (58)	35 (34)	40 (36)	40 (29)	44 (11)	80 (10)	47 (10)	23	9 (1)	
	21	18—49[b]	18—129	12—107	16—99	11—41	10—96	10—150	8—198	10—76	18—48	
		23,27,33[c]	22,27,34	20,23,30	22,26,33	17,20,27	18,24,31	15,20,28	15,19,24	20,24,41	19,24,28	
Ovruchskii R.		8 (3)	11 (2)	15 (5)	17 (3)	20 (3)	18 (5)	29 (6)	22 (2)	14	5	
		21—140	26—493	28—401	11—189	15—2380	17—249	14—393	12—118	20—197	21—50	
		25,28,36	28,41,239	34,47,121	23,33,43	28,44,98	27,38,50	23,30,38	27,38,49	36,68,91	24,32,32	
Olevskii R.	(2)	15 (4)	26 (4)	20 (4)	39 (1)	28 (2)	27 (5)	46 (2)	49 (5)	36 (2)	31 (1)	19
		21—438	17—154	26—1255	12—416	14—149	19—223	25—697	17—342	27—793	27—469	19—560
		40,72,257	42,53,85	46,75,133	43,71,115	38,56,90	51,81,106	61,86,120	67,96,127	83,127,209	70,126,203	50,121,219
Narodichskii R.		2	4	1	1	4	4	3 (1)	4	3	1	
		96—142	45—466	294	168	42—349	34—216	39—358	33—270	23—232	162	
			53,180,382			111,196,281	65,102,161	39,128,358	40,49,161	23,79,232		
Korostenskii R.	3 (1)	10 (5)	12 (14)	17 (12)	26 (5)	12 (15)	20 (15)	27 (6)	20 (7)	21 (2)	10 (1)	1
	30—66	19—153	13—86	17—139	17—189	15—96	18—69	10—130	11—302	11—217	15—161	129
	30,30,66	29,43,86	23,33,62	23,44,62	25,36,71	17,20,31	21,24,45	14,19,22	18,31,56	19,24,39	24,47,87	
Luginskii R.		6 (2)	7 (6)	17 (8)	19 (7)	11 (1)	15 (3)	23 (3)	29	21 (1)	8 (2)	
		31—213	22—409	21—189	16—713	14—252	14—233	14—136	18—754	16—454	13—212	
		40,46,52	33,52,69	34,48,56	32,51,85	17,44,93	29,47,69	28,37,51	34,61,104	38,51,104	39,49,75	
Emilchinskii R.				(1)	1							
					22							
Malinskii R.	8 (5)	9 (7)	16 (5)	19 (2)	11 (4)	14 (5)	17 (4)	18 (1)	10 (3)	6 (1)	1 (2)	
	23—70	23—87	22—109	20—89	21—60	17—83	15—72	14—86	25—117	22—65	106	
	28,39,46	26,38,51	39,43,62	30,34,53	27,36,53	22,41,50	33,38,49	20,34,46	36,43,53	24,40,62		

(cont.)

A48-T53. Continued.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
V. Volinskii R.	3 (2)	17 (9)	48 (43)	38 (41)	35 (52)	40 (28)	70 (19)	35 (14)	37 (13)	50 (32)	102 (30)	
	18—46	20—53	16—216	17—82	17—111	12—69	11—226	13—121	13—75	11—90	10—118	
	18,20,46	30,33,39	24,33,43	23,32,38	21,26,32	23,30,36	18,26,38	20,34,55	21,30,46	19,26,38	16,21,30	
N. Volinskii R.	1 (2)	3 (2)	5 (5)	7 (8)	7 (6)	6 (2)	6 (2)	5 (2)	7 (1)	2	4	
	51	30—67	25—85	23—41	20—53	16—41	19—248	19—41	21—92	34—37	10—35	
		30,59,67	33,39,41	25,31,34	22,26,48	20,36,37	19,21,103	19,26,31	24,29,41		14,19,28	
Radomishliskii R.												
Brusilovskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T54. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls. Examined in 1993.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
Korosten City	3	32 (31)[a]	25 (68)	28 (50)	33 (51)	39 (35)	25 (28)	67 (43)	43 (38)	36 (12)	12 (9)	3 (3)
	23—45	19—196[b]	16—54	13—163	14—728	12—136	14—180	10—123	9—62	10—95	16—38	12—159
	23,30,45	27,34,46[c]	22,23,30	19,30,38	18,23,32	16,24,27	15,17,27	14,17,26	13,15,19	12,20,30	21,22,31	12,23,159
Ovruchskii R.	1	4 (2)	7 (2)	20 (5)	23 (4)	18 (3)	33 (4)	49 (9)	47 (8)	24 (4)	11 (3)	
	40	32—70	19—88	18—146	17—87	14—108	14—105	12—1179	10—124	12—178	19—47	
		34,40,57	26,55,74	25,37,49	29,37,56	24,34,62	27,35,46	29,40,55	20,33,48	22,35,47	26,40,44	
Olevskii R.	(1)	7 (5)	31 (10)	27 (5)	37 (8)	43 (6)	28 (2)	40 (3)	51 (5)	47 (8)	63 (10)	30 (3)
		35—142	24—183	24—424	24—540	17—348	18—495	14—179	12—403	10—287	11—225	18—153
		37,40,52	34,50,81	39,60,121	52,70,92	40,73,87	59,89,124	35,66,93	36,59,96	40,59,88	32,49,97	39,56,84
Narodichskii R.		(1)		3 (1)	1 (1)	3 (1)	1	2	2 (1)	(1)	2	
				51—289	21	44—186	23	38—471	29—102		51—145	
				51,219,289		44,60,186						
Korostenskii R.	(2)	8 (10)	12 (21)	19 (8)	21 (18)	21 (8)	20 (18)	34 (13)	31 (13)	21 (4)	12 (4)	5
		19—251	22—151	14—244	16—94	10—90	9—68	11—115	9—126	10—213	10—129	14—43
		21,27,130	28,42,60	28,33,47	24,31,37	22,26,34	18,25,50	14,20,29	14,22,40	16,24,46	14,21,32	16,19,31
Luginskii R.	(1)	2	22 (4)	16 (12)	30 (10)	15 (6)	22 (4)	25 (3)	28 (1)	26 (1)	29 (1)	1
		46—51	20—374	17—175	20—245	15—177	12—302	12—1125	10—158	11—88	10—194	22
			27,48,85	31,44,63	26,47,75	23,34,119	25,37,117	27,48,115	23,36,59	24,39,49	20,34,58	
Emilchinskii R.									2		(1)	
									22—41			
Malinskii R.	4 (1)	4 (1)	9 (8)	12 (4)	18 (10)	18 (2)	19 (4)	10 (6)	8 (3)	6 (1)		
	49—53	28—53	33—45	20—50	18—96	17—188	17—105	17—52	15—37	11—44		
	49,50,51	31,35,44	35,39,43	22,35,44	26,40,54	21,30,45	25,38,50	19,33,42	20,30,35	13,28,43		

(cont.)

A48-T54. Continued.

Place of residence	Age (years) at the time of examination											
	6	7	8	9	10	11	12	13	14	15	16	17
V. Volinskii R.	3 (4)	8 (7)	40 (34)	23 (40)	34 (36)	54 (25)	50 (25)	35 (14)	40 (36)	86 (64)	92 (80)	
	38–58	21–65	18–83	17–86	14–65	12–89	11–132	13–67	13–58	11–105	11–89	
	38,52,58	33,43,51	25,30,36	20,29,41	20,28,34	20,26,40	17,26,36	19,26,34	18,27,36	16,23,35	16,21,28	
N. Volinskii R.	(1)	4 (2)	7 (5)	7 (6)	6 (7)	16 (6)	10 (5)	9 (4)	8 (2)	7	3	
		23–54	24–116	15–73	19–87	12–75	13–64	18–60	15–38	11–24	13–145	
		25,31,44	24,29,52	19,28,57	21,33,47	20,27,39	19,28,41	26,28,37	20,30,35	13,18,22	13,38,145	
Radomishliskii R.												
Brusilovskii R.												

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T55. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Korosten City	9 (13)[a]	76 (73)	82 (69)	128 (70)	128 (52)	103 (40)	168 (37)	165 (19)	123 (12)	109 (12)	21 (3)
	19–81[b]	10–93	12–163	14–217	11–360	13–204	8–251	10–203	10–151	9–166	12–147
	27,38,45[c]	25,33,44	25,34,46	22,31,44	21,31,44	20,26,41	20,32,43	21,33,45	25,37,54	23,31,50	31,34,45
Ovruchskii R.		2	1	3	1 (1)	1 (1)	1	1			
		36–69	62	29–51	23	48	25	129			
				29,38,51							
Olevskii R.		29 (1)	36	35	25	23	26	32	1	7	
		23–185	23–179	15–168	18–104	18–164	16–184	30–159	48–152	23–148	
		51,61,77	49,66,90	36,58,80	40,50,65	37,45,104	41,58,77	48,68,101	55,73,109	30,49,81	
Narodichskii R.	1	12 (3)	11 (1)	24 (1)	27 (3)	25	16	21	24	18	
	186	34–163	45–394	15–543	20–1101	19–374	53–444	39–891	36–381	33–399	
		41,89,143	99,129,301	86,128,161	105,157,265	63,117,218	119,147,215	123,192,395	101,163,245	76,164,248	
Korostenskii R.	37 (24)	61 (23)	92 (30)	95 (23)	87 (21)	106 (8)	104 (8)	125 (4)	89 (4)	68 (2)	22
	21–159	14–237	18–288	15–632	16–614	14–578	11–519	8–580	10–397	10–364	10–134
	27,35,53	31,46,66	28,36,64	26,42,89	25,39,66	28,41,62	22,35,56	28,43,64	30,48,87	33,49,88	18,53,71
Luginskii R.	9 (1)	25 (2)	28 (3)	28 (4)	36 (1)	23	23	15	10	6	
	35–215	26–323	16–199	22–388	28–625	25–244	18–273	24–401	54–325	43–404	
	40,78,117	53,71,118	33,59,98	43,63,120	50,85,185	45,66,97	54,69,119	79,150,251	81,107,180	72,128,190	
Emilchinskii R.	1 (7)	19 (18)	22 (22)	24 (28)	16 (10)	23 (11)	13 (8)	14 (7)	10	6 (2)	
	22	20–263	12–368	15–141	13–182	12–131	13–330	14–285	13–106	16–43	
		31,47,103	19,40,81	18,24,44	21,28,59	18,22,40	22,44,109	19,28,57	19,23,26	18,21,33	
Malinskii R.											

(cont.)

A48-T55. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
V. Volinskii R.	(2)	16 (7)	31 (7)	34 (10)	24 (8)	32 (4)	33 (5)	32 (1)	5	1	
		22—69	15—82	15—55	16—52	15—58	16—60	12—58	18—44	59	
		24,32,65	25,29,38	23,28,46	23,27,42	25,31,45	21,28,38	25,35,43	18,29,30		
N. Volinskii R.								1			
								40			
Radomishliskii R.											
Brusilovskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T56. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls. Examined in 1994.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
Korosten City	18 (19)[a]	71 (85)	79 (78)	82 (81)	124 (54)	128 (43)	152 (41)	153 (43)	111 (27)	119 (27)	36 (5)
	22—61[b]	15—109	16—105	12—156	11—139	10—123	9—103	11—23481	10—226	10—140	10—162
	30,38,41[c]	24,33,47	26,32,47	23,31,50	18,26,38	20,27,40	18,25,35	21,30,41	19,31,46	19,29,42	18,26,43
Ovruchskii R.		(2)	(1)	2	4		2	1	1	1	
				28—32	18—125		11—29	27	192	140	
					18,21,74						
Olevskii R.		20	47 (5)	38 (2)	38 (1)	35	31	50	26 (2)	15	3
		24—205	18—174	17—174	14—202	23—187	10—133	18—241	24—134	27—183	38—75
		44,60,107	35,56,89	36,57,72	30,45,61	35,51,67	36,53,75	45,61,81	34,58,87	39,58,79	38,61,75
Narodichskii R.		8 (2)	9 (3)	35 (1)	33	21	35 (1)	29 (1)	33	18	
		31—249	25—628	13—369	20—458	12—293	12—1003	16—460	28—288	23—205	
		45,126,155	56,76,166	68,122,189	53,91,167	61,102,168	40,88,165	86,116,267	88,130,179	66,92,156	
Korostenskii R.	34 (28)	59 (35)	91 (36)	91 (28)	115 (33)	101 (8)	111 (10)	95 (18)	81 (5)	62 (9)	18
	20—85	15—293	15—804	14—492	12—274	11—465	10—566	12—267	9—296	10—309	13—126
	30,39,52	31,41,71	29,43,106	26,38,68	25,36,50	24,33,48	21,33,69	21,34,48	21,30,50	23,34,56	20,37,51
Luginskii R.	7	20 (2)	24 (1)	29 (3)	33 (3)	38 (1)	17 (1)	22 (1)	7	7	
	33—124	30—240	24—374	24—348	20—286	16—362	31—192	20—214	49—195	65—340	
	34,106,121	55,68,112	46,59,100	55,73,104	44,67,102	41,57,93	44,69,103	44,70,121	68,130,185	67,113,202	
Emilchinskii R.	1 (8)	10 (23)	17 (26)	27 (26)	19 (20)	26 (17)	43 (12)	23 (18)	20 (6)	4 (1)	1
	135	18—70	17—134	12—158	11—61	13—149	9—142	11—86	12—101	24—108	21
		25,28,42	22,24,34	23,26,49	17,24,34	16,24,34	18,26,42	16,28,43	17,22,31	28,67,105	
Malinskii R.						(1)				1	
										18	

(cont.)

A48-T56. Continued.

Place of residence	Age (years) at the time of examination										
	7	8	9	10	11	12	13	14	15	16	17
V. Volinskii R.		14 (6)	28 (13)	23 (8)	38 (4)	46 (2)	45 (1)	39 (2)	1 (1)	2	1
		22–73	20–71	16–67	16–54	12–93	11–62	10–54	20	31–52	31
		28,40,45	24,30,39	20,25,40	24,28,36	25,37,45	27,36,42	17,35,42			
N. Volinskii R.			1	1			1				
			24	27			27				
Radomishliskii R.											
Brusilovskii R.											

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T57. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Korosten City	17 (11)[a]	82 (87)	60 (36)	48 (44)	95 (31)	64 (16)	101 (22)	90 (9)	79 (8)	13 (1)
	18—79[b]	12—140	15—117	14—101	10—130	10—192	8—321	9—120	8—163	11—100
	22,25,30[c]	22,29,37	20,27,41	20,27,42	18,24,34	20,26,33	17,26,40	17,24,39	17,27,38	17,26,63
Ovruchskii R.	1	12 (2)	15	19	15	20	13	11	14	1
	49	26—195	29—322	28—336	15—158	21—282	32—353	27—309	16—166	156
		61,73,91	53,78,145	57,77,120	48,74,97	53,79,116	54,96,121	58,67,181	52,66,81	
Olevskii R.		59	61	53 (1)	65	45	53	50	32	15 (1)
		33—329	33—315	30—294	26—467	38—312	34—289	39—235	39—360	41—173
		63,82,122	74,104,132	70,118,166	58,101,165	67,101,158	59,95,136	70,100,141	69,111,170	47,63,128
Narodichskii R.										
Korostenskii R.	15 (2)	29 (15)	60 (7)	51 (9)	71 (9)	56 (8)	82 (9)	55 (4)	44	11
	22—104	17—194	13—125	14—318	13—120	16—88	10—136	12—127	16—133	22—91
	25,33,41	28,31,72	24,31,44	27,38,53	25,34,46	24,32,41	26,35,44	25,41,56	27,36,62	42,51,73
Luginskii R.		15	20	28	40	24	13	17	11	1
		27—264	24—166	27—357	32—885	21—255	58—275	41—250	57—157	65
		65,71,102	43,65,110	48,78,101	56,74,108	55,83,125	72,107,138	64,81,118	80,104,129	
Emilchinskii R.		7 (1)	33 (2)	28 (2)	39 (4)	42	29 (2)	28 (1)	18	
		25—54	19—163	16—54	17—101	11—245	19—122	19—213	22—63	
		30,34,45	31,34,45	26,32,39	27,35,41	26,32,46	26,30,50	29,34,50	31,36,53	
Malinskii R.		11 (2)	21 (10)	27 (10)	30 (5)	45 (5)	49 (1)	36 (3)	27 (1)	1
		27—60	28—90	17—57	20—64	14—76	20—88	13—73	20—71	32
		32,41,50	34,41,46	26,34,42	31,39,46	31,40,45	30,38,51	26,33,45	34,42,52	
V. Volinskii R.		22 (3)	48 (4)	55 (3)	49	39	42	44 (1)	18	1
		21—59	18—48	19—49	14—49	14—56	15—85	12—49	15—41	30
		29,33,38	29,33,40	29,34,41	28,35,39	27,35,41	27,34,40	25,31,34	22,28,32	
N. Volinskii R.		29 (22)	32 (18)	32 (13)	32 (17)	29 (21)	14 (5)	5 (4)	2	
		14—218	16—315	13—372	11—305	13—136	12—320	19—58	26—27	
		22,29,65	21,27,57	22,30,68	19,33,47	24,30,41	23,35,52	20,40,52		
Radomishliskii R.										
Brusilovskii R.										

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T58. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls. Examined in 1995.

Place of residence	Age (years) at the time of examination									
	8	9	10	11	12	13	14	15	16	17
Korosten City	6 (10)[a]	68 (102)	54 (50)	54 (41)	89 (37)	75 (34)	88 (28)	79 (26)	55 (10)	11 (2)
	21—61[b]	15—132	12—132	9—169	10—149	12—101	9—88	9—486	11—76	11—88
	31,35,45[c]	21,28,39	21,28,37	18,25,36	17,23,32	19,25,35	16,20,34	15,25,38	18,27,35	13,18,36
Ovruchskii R.	1	12 (1)	13	20	15 (1)	11	17	17 (1)	22	3 (1)
	47	32—141	19—143	27—231	25—183	50—141	13—223	13—142	14—248	38—82
		48,62,106	49,65,88	57,77,93	55,88,113	53,73,97	42,67,104	40,52,79	45,63,94	38,77,82
Olevskii R.		58 (1)	56	49	75	54	48	45 (1)	39	40
		23—245	27—382	26—259	20—345	25—443	23—499	12—355	26—218	25—180
		59,88,135	58,92,127	62,84,115	58,81,105	66,89,130	62,86,116	47,76,125	49,64,93	35,59,88
Narodichskii R.										
Korostenskii R.	8 (2)	38 (25)	57 (15)	58 (12)	52 (6)	56 (9)	53 (6)	47 (6)	50 (5)	10 (1)
	27—101	16—258	14—228	12—164	15—355	11—251	13—99	13—123	10—113	18—81
	32,40,66	28,38,48	26,35,49	25,32,45	25,32,41	26,37,49	23,28,36	24,31,44	24,30,43	24,31,48
Luginskii R.		5	12	20	21	22	14	19	15	
		47—206	25—155	22—316	52—330	28—240	21—446	30—351	41—137	
		77,77,120	57,100,134	44,53,80	64,80,108	45,52,85	53,78,90	50,71,127	54,89,109	
Emilchinskii R.		6 (4)	35 (4)	35	28 (1)	35 (2)	38 (3)	21 (1)	21	
		29—42	23—172	20—82	16—63	12—66	13—153	22—221	13—72	
		29,32,38	32,43,62	24,33,40	26,31,38	27,30,38	23,35,50	27,34,62	22,42,51	
Malinskii R.		14 (3)	28 (11)	32 (3)	36 (12)	39 (4)	47 (4)	35 (1)	31 (2)	2
		20—68	22—60	17—59	11—78	21—78	17—66	12—94	9—49	33—35
		35,39,43	32,38,47	28,34,43	27,31,40	30,35,39	30,36,40	28,33,45	27,29,37	
V. Volinskii R.		28 (1)	49 (2)	42 (2)	50 (2)	38	37 (2)	50 (3)	19	1
		20—46	16—64	19—50	19—55	19—49	11—53	12—46	17—42	17
		30,31,38	30,33,37	29,33,38	32,36,41	27,33,39	27,32,39	22,25,31	22,28,32	
N. Volinskii R.		32 (17)	52 (30)	61 (30)	50 (16)	51 (19)	27 (12)	15 (2)	3 (2)	1
		15—162	12—192	14—276	11—204	11—322	13—187	10—119	11—34	26
		25,33,53	20,25,41	22,30,43	19,25,48	18,23,39	23,29,37	13,22,26	11,22,34	
Radomishliskii R.										
Brusilovskii R.										

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T59. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Boys. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Korosten City		2		2 (1)	9 (3)[a]	4 (1)		(1)	
		32—50		22—39	17—94[b]	14—39			
					22,28,43[c]	20,27,34			
Ovruchskii R.	10	78 (4)	91 (11)	95 (6)	99 (3)	122 (4)	119 (1)	78	31 (1)
	20—201	16—472	12—952	12—660	13—788	15—380	10—365	15—463	13—580
	36,42,107	32,68,89	34,56,75	41,67,100	40,62,84	35,57,91	35,56,95	47,74,122	48,82,191
Olevskii R.									
Narodichskii R.									
Korostenskii R.									
Luginskii R.									
Emilchinskii R.	4	27 (13)	27 (15)	34 (7)	21 (10)	26 (7)	54 (3)	23 (2)	7
	26—65	15—236	19—130	13—308	18—267	10—267	11—300	10—199	12—272
	28,43,61	22,42,79	24,40,94	28,41,75	23,40,55	23,48,66	21,33,71	21,48,114	20,45,166
Malinskii R.		14 (46)	21 (50)	17 (43)	37 (42)	34 (53)	32 (21)	11 (12)	7 (7)
		16—83	15—78	12—38	11—86	12—105	11—406	11—23	13—59
		20,26,36	22,25,37	16,20,29	16,18,26	16,19,23	14,17,26	15,16,19	14,15,21
V. Volinskii R.									
N. Volinskii R.									
Radomishliskii R.									
Brusilovskii R.									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

A48-T60. Distribution of whole-body ^{137}Cs count per body weight (Bq/kg) by place of residence and age at the time of examination. Zhitomir region, Ukraine. Girls. Examined in 1996.

Place of residence	Age (years) at the time of examination								
	9	10	11	12	13	14	15	16	17
Korosten City		2 (1)	9	9 (1)[a]	10 (4)	4	1		
		42–55	17–56	19–155[b]	12–39	14–49	12		
			26,33,44	22,24,32[c]	13,20,27	15,24,41			
Ovruchskii R.	20	76 (8)	108 (15)	122 (5)	125 (8)	109 (7)	99 (7)	107 (2)	23 (1)
	21–268	16–365	14–522	13–323	15–306	13–359	11–367	13–238	14–101
	49,58,75	38,57,83	35,54,73	32,56,75	33,48,72	35,53,74	35,53,68	33,50,80	28,42,59
Olevskii R.							(1)		1
									42
Narodichskii R.									
Korostenskii R.			(1)		1			1	
					11			52	
Luginskii R.									
Emilchinskii R.	1 (1)	26 (17)	14 (19)	19 (13)	16 (9)	25 (17)	50 (12)	23 (7)	11 (1)
	19	18–252	13–232	13–190	12–145	9–209	10–129	12–181	9–147
		27,46,62	21,32,56	16,33,74	14,20,59	18,25,46	17,24,35	17,34,70	28,62,80
Malinskii R.	(2)	9 (45)	16 (59)	24 (44)	17 (48)	23 (52)	15 (33)	6 (23)	2 (9)
		19–265	14–35	11–350	13–64	12–70	11–40	12–26	20–21
		22,28,36	18,20,24	17,24,35	18,20,24	15,21,31	13,18,22	15,20,22	
V. Volinskii R.									
N. Volinskii R.									
Radomishliskii R.									
Brusilovskii R.									

[a]Number of subjects in whom ^{137}Cs was detected. Detection limit was 540 Bq. Numbers in parentheses refer to subjects in whom ^{137}Cs was not detected; [b]Range of detected whole-body ^{137}Cs counts. Original data are given if the number of subjects was one; [c]The 25th, 50th and 75th sample percentiles of detected whole-body ^{137}Cs counts. Data are not given if the number of subjects was less than three.

Appendix B

List of participants in the Chernobyl Sasakawa Health and Medical Cooperation Project

Belarus

Gomel Region

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Blood examination: Nelly K. Derzhitskaya, Alla N. Demidenko, Tatyana B. Artyuh, Nina P. Komissarova, Irina V. Aparovich, Elena I. Leonenko, Oksana V. Zhuk, Natalya N. Shvedova, Alexander V. Makeev

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Belarus

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Transport: Vladimir N. Yermachenko, Alexandr N. Katsapov, Nikolay G. Dorozhko

Russian Federation

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Ukraine

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Dosimetry: Vladimir P. Shevchuk, Vadim E. Goncharenko

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Appendix C

Sasakawa Memorial Health Foundation

Establishment of the Foundation

The late Mr Ryoichi Sasakawa, the then president of the Japan Shipbuilding Industry Foundation (now the Nippon Foundation), out of his lifelong conviction that "The world is one family and all mankind are brothers and sisters", offered a portion of his personal fortune to promote international cooperation in the field of health and welfare with special emphasis on leprosy in the developing countries. Following this generous offer, Sasakawa Memorial Health Foundation was established in 1974 to realize Mr Sasakawa's ideals.

Outline of the activities

Although leprosy control has been its main objective since establishment, the Foundation has also addressed public health problems other than leprosy that will have a higher priority in the future since the multidrug therapy (MDT) recommended by WHO is achieving remarkable success in leprosy control and elimination of leprosy as a public health problem is no longer a dream.

The activities of Sasakawa Memorial Health Foundation currently being implemented are as follows:

1) leprosy control,
2) parasitic disease control,
3) Sasakawa Medical Scholarship Programme,
4) WHO Sasakawa Health Prize,
5) Chernobyl Sasakawa Health and Medical Cooperation Project, and
6) HIV/AIDS control.

Source of funds

A large portion of the Foundation's budget is made available by the Nippon Foundation, which provides various grants annually to a multitude of nonprofit organizations both in Japan and abroad. In addition, there are individuals and organizations with a keen interest in the Foundation's activities who make regular monetary contributions.

Postscript

The Fifth Chernobyl Sasakawa Medical Cooperation Symposium held in Kiev, Ukraine in October 1996 brought the 5-year Chernobyl Sasakawa Health and Medical Cooperation Project to a successful conclusion. Launched as an international humanitarian undertaking prior to the collapse of the Soviet Union, the project was punctuated by annual workshops and symposia, and has published its results in an English and Russian annual report on four occasions. The present volume, a comprehensive synopsis of the 5-year examination results published on the 10th anniversary of the Chernobyl accident, includes addresses, debates, and special contributions from concerned persons, in addition to the reports in specific fields from each center. The detailed data obtained in the 5-year examinations at the five centers are also included in the volume as an appendix for future analyses, as well as for understanding the project.

Although the project was a process of trial and error, it is indeed extraordinary, in light of the severe social and economic turmoil after the collapse of the Soviet Union, that the five centers managed to continue their examination activities right up to April 1996 under unified diagnostic criteria. The accumulated data and know-how will undoubtedly contribute greatly to future activities and to the improvement of medical services to local residents. We would like to express our gratitude for the efforts of the health departments, health offices, and diagnostic centers in each country and for the support extended by so many people.

Although the reader is asked to refer to the comments of the Japanese specialists on the content of the reports from each center, the results of the Chernobyl Sasakawa Health and Medical Cooperation Project have been very well-received internationally, and the data presented here are provided for the use of the international community as an asset for all of humankind.

As the only country in the world exposed to atomic bombings, Japan must continue to provide support and cooperation in response to demands from abroad. We ardently hope that the examination results collected by Belarus, Russia, Ukraine, and Japan and now stored mainly in the Mogilev Diagnostic Center database will be used in research and medical treatment for persons around the world suffering from exposure to radiation.

Finally, we would like to extend our deep gratitude to the many people involved in the project over the years.

Shunichi Yamashita
Yoshisada Shibata

Index of authors