

Editor - in - Chief

A.F.Tsyb

Academician of RAMS; Chairman, All-Russia Scientific Commission on Radiation Protection; Director, Medical Radiological Research Center of RAMS (Obninsk)

Deputy Editor

V.K.Ivanov

Corr. Member of RATS; Member of All-Russia Scientific Commission on Radiation Protection; Deputy Director, Medical Radiological Research Center of RAMS (Obninsk)

Editorial Coordinator

V.A.Sokolov

Cand.Sc., Biology

Editorial Board

R.M.Alexakhin	Academician of RAAS, Member of ARSCR (Obninsk)	N.A.Meshkov	D.Sc., Medicine (Moscow)
A.V.Akleev	D.Sc., Medicine (Chelyabinsk)	A.M.Nikiforov	D.Sc., Medicine (St. Petersburg)
M.I.Balonov	D.Sc., Biology, Member of ARSCR (St. Petersburg)	R.G.Oganov	Corr. Member of RAMS (Moscow)
I.I.Dedov	Academician of RAMS (Moscow)	G.G.Onishchenko	First Deputy Minister, Ministry of Health RF (Moscow)
V.Ya.Golikov	D.Sc., Medicine (Moscow)	V.A.Pitkevich	Cand.Sc., Phys.-Math. (Obninsk)
L.A.Ilyin	Academician of RAMS (Moscow)	Yu.D.Skoropad	D.Sc., Medicine (Obninsk)
S.V.Khetagurov	Deputy Minister, Ministry on Civil Defence, Emergencies and Elimination of Natural Calamity Effects RF (Moscow)	G.N.Sushkevich	D.Sc., Medicine, WHO (Geneva)
M.A.Maksyutov	Cand.Sc., Tech. (Obninsk)	V.M.Shershakov	Cand.Sc., Tech. (Obninsk)
		A.I.Vorobyov	Academician of RAMS (Moscow)
		A.Yu.Yakovlev	Academician of RANS (St. Petersburg)

Advisory Council

G.D.Baisogolov	Professor (Obninsk)	T.Kumatori	Professor, Chairman Board of Directors, Radiation Effects Association (Tokyo)
W.Burkart	Ph.D., Institut fur Strahlenhygiene (Munich)	K.Mabuchi	Professor, Radiation Effects Research Foundation (Hiroshima)
E.B.Burlakova	D.Sc., Professor (Moscow)	E.G.Matveenko	Professor (Obninsk)
E.Cardis	Ph.D., International Agency for Research on Cancer, WHO (Lyon)	D.L.Preston	Ph.D., Radiation Effects Research Foundation (Hiroshima)
K.Chadwick	F.Inst.P., Commission of the European Communities (Brussels)	P.V.Ramzaev	D.Sc., Professor (St. Petersburg)
V.F.Demin	Cand.Sc., Phys.-Math. (Moscow)	A.V.Sevankaev	D.Sc., Professor (Obninsk)
M.Goldman	Ph.D., Professor, University of California (Davis)	Y.Shibata	Ph.D., Radiation Effects Research Foundation (Nagasaki)
V.L.Grishin	President, Soyuz "Chernobyl" (Moscow)	I.Shigematsu	Professor, Radiation Effects Research Foundation (Hiroshima)
S.I.Ivanov	Cand.Sc., Medicine, Ministry of Health RF (Moscow)	H.Storm	Ph.D., Danish Cancer Society (Copenhagen)
A.Karaoglou	Ph.D., European Commission (Brussels)	R.Wilson	D. Phil. Professor, Harvard University (Cambridge)
A.Kellerer	D.Sc., Professor, Radiobiological Institute (Munich)		

The presented personnel of Editorial Board and Advisory Council were appointed in 1996.

RAMS - Russian Academy of Medical Sciences

RATS - Russian Academy of Technological Sciences

RAAS - Russian Academy of Agricultural Sciences

RANS - Russian Academy of Natural Sciences

Contents

Preface to English Translation R.Wilson	7
Preface	8
Scientific Articles	9
Ivanov V.K., Tsyb A.F., Gorsky A.I., Maksioutov M.A. Dynamics of thyroid cancer incidence in Russia following the Chernobyl accident: Eco-epidemiological analysis	9
Biryukov A.P., Ivanov V.K., Kochergina E.V., Ivanov S.I., Karyakin O.B., Maltseva V.I. Study of malignant neoplasms of the genitourinary system among Chernobyl accident emergency workers over Russian Federation in 1987-1996	21
Ivanov V.K., Maksioutov M.A., Chekin S.Yu., Kruglova Z.G., Petrov A.V., Tsyb A.F., Ivanov S.I. Radiation-epidemiological analysis of incidence of non-cancer diseases among the Chernobyl liquidators	29
Ivanov V.K., Pitkevitch V.A., Gorsky A.I., Maksioutov M.A., Vlasov O.K. Thyroid dose and thyroid cancer incidence after Chernobyl accident: assessment for the Bryansk region of Russia	44
Ivanov V.K., Tsyb A.F., Maksioutov M.A., Pitkevich V.A., Birukov A.P., Matiash V.A., Korelo A.M., Chekin S.Yu., Nilova E.V. Radiation epidemiological studies in Russian National Medical and Dosimetric Registry with respect to Chernobyl accident: I. Cancer and non-cancer registration system among Chernobyl liquidators and the population living in the areas contaminated with radionuclides in Russia (history and the present status)	59
Ivanov V.K., Tsyb A.F., Gorsky A.I., Rastopchin Eu.M., Maksioutov M.A., Chekin S.Yu., Pitkevich V.A., Vlasov O.K. Radiation epidemiological studies in Russian National Medical and Dosimetric Registry with respect to Chernobyl accident: II. Assessment of radiation risk of cancer and non-cancer diseases, 1986-1999	75
Ivanov V.K., Ilin L.A., Tsyb A.F., Tukov A.R., Gorski A.I., Maksioutov M.A., Matyash V.A. Radiation and epidemiological analysis for cancer incidence among nuclear workers taken part recovery operations following the accident at the Chernobyl NPP	85

Preface to English Translation

Preface to the English Translation

It is just 15 years ago, in the early morning that a test was being made at unit number 4 of the V.I. Lenin nuclear power plant at Chernobyl, 3 miles south east of Pripyat, on the Pripyat River. When operators pressed the emergency button to insert the shut down rods in exploded. During the subsequent 10 days, the graphite moderator of the reactor burned; all the gaseous fission products were released; much of the cesium evaporated and was released. Radioactive material was detected half way around the world. Some 300,000 clean up workers (called liquidators in the USSR) labored in shifts to clean up the plant so that the three undamaged reactors could be restarted. Very soon thereafter, authorities of the Soviet Union set up institutes to study the effects on human health so that mankind may learn from this catastrophe. There are several groups of people who were exposed to various amounts of radioactive material. About 150 people developed radiation sickness. These and about 150 others must have been exposed to about 2 Sv. It was originally estimated in the August 1965 IAEA report that 45,000 persons living downwind of Chernobyl and evacuated a few days after the accident were exposed to an average of 0.45 Sv. However, it is now generally agreed that this dose estimate was too high by a factor of three. Then there were the liquidators themselves who received an average of 0.2 Sv in the first year, and an average of 0.1 Sv in the next years. The liquidators therefore represent the largest group who had an appreciable radiation dose from the Chernobyl accident.

Of the ailments that are known to be increased by radiation exposure, thyroid cancers among children were discussed intensively in a previous issue, but a radiation coefficient is presented here. Leukemia would have started to appear about 1991, and cancers of solid tissue should start to appear about now. This important issue of "Radiation and Risk", compiled by the staff at the Medical Research Institute in Obninsk describes the effect on the health, particularly on development of cancer, of the Chernobyl accident. On the assumption that the various ailments are caused by radiation, the authors of these reports estimate coefficients relating the excess risk for each outcome with radiation exposure. Although the relationship is statistically significant for many tumors, the authors are deliberately cautious in their claims. In most cases the studies were not performed blind. The examining physicians inevitably knew something about the exposure in advance. There are plausible alternate explanations for the significant correlation, such as stress, which was almost certainly increased with increasing radiation exposure. In the coming years these data will be carefully examined for clues which, if any, explanation is truly causal. Data are only available for liquidators in Russia. It is to be hoped that these data will be joined by equivalent data from Ukraine and Belarus, and other regions such as the Baltic States.

Those outside Russia should be grateful for Academician Tsyb, Professor Ivanov and collaborators for making these data more easily accessible to the world. The editor of the English edition thanks The Richard Lounsbury Foundation, the National Cancer Institute, and a few generous private donors for making the funding available for this translation.

Richard Wilson
April 26th 2001

PREFACE

It is 13 years since the Chernobyl accident. Numerous scientific conferences and working meetings, publications, national and international projects devoted to different aspects of the Chernobyl accident testify that the issue is still high on the agenda of the scientific community. The Chernobyl related research efforts range from molecular-genetic mechanisms of radiation induced cancers to large-scale epidemiological studies, from dose reconstruction and monitoring of the radiation situation in contaminated areas to dynamics of psychological health of the exposed population. With the growth of thyroid cancer cases studied extensively, the focus is now shifted to post-Chernobyl non-cancer thyroid pathology and other hormonal disorders. Increasing emphasis is placed on understanding of general somatic effects. At the same time, individual, collective and environmental dosimetry, reliability of dose estimates, adequacy of models and validity of radiation safety standards remain to be controversial subjects.

For problems of the dimension of health effects of the Chernobyl accident the quality and volume of primary epidemiological data are of key importance and this actually amounts to the very range of organizational, technological and methodological issues with which the National Radiation-Epidemiological Registry is concerned.

The present issue of the Bulletin contains the latest statistical data on dynamics and structure of incidence among the Chernobyl emergency workers from the registry database.

The Bulletin starting from Issue N 10 includes articles of leading home and foreign authors. These provide detailed information for specialists and offer a means for independent analysis of available data, which may be either complementary to authors' conclusions or proposing an alternative interpretation. The Bulletin pages are always open for discussion.

The traditional sections of the Bulletin contain information of current interest regarding activities of the Russian Scientific Commission on Radiation Protection, international scientific collaboration and papers in periodicals.

Starting from 1999 there is a home page of the «Radiation and risk» Bulletin in Internet (<http://radrisk.obninsk.com>) and work on a computer version of the Bulletin is in progress.

Editorial Board