



**World Health
Organization**

**Health Effects
of the Chernobyl Accident
and
Special Health Care Programmes**

Report of the UN Chernobyl Forum
Expert Group "Health"

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Foreword

Twenty years have passed since the worst nuclear reactor accident in the world occurred at the Chernobyl nuclear power plant in Ukraine. The radioactive contamination which resulted from the explosion and fire in the first few days spread over large areas of neighbouring Belarus and the Russian Federation, with most of the fallout in Belarus. While national and local authorities did not immediately disclose the scale of the accident, the mitigation measures, such as distribution of potassium iodine pills, food restriction, and mass evacuation from areas where the radioactive contamination was greatest, undoubtedly reduced the health impact of the radiation exposure and saved many lives.

The accident caused severe social and economic disruption and had significant environmental and health impact. This was aggravated by the political and economical changes in the three affected states related to the break-down of the Soviet Union. In the aftermath of the accident the international scientific and medical community collaborated closely with national experts dealing with health effects of the accident in the affected countries.

There is a substantial body of international collaborative projects on the situation, which should lead to advancement in radiation sciences. However, considerable speculation and disinformation remains about the possible health impact of the accident for the millions of affected people. To address the health, environmental and socioeconomic consequences of the Chernobyl accident, the United Nations in 2003 launched an Inter-Agency initiative, the Chernobyl Forum. The Forum's Secretariat, led by the International Atomic Energy Agency (IAEA), the World Health Organization (WHO), the United Nations Development Programme (UNDP), and several other international organizations collaborated with the governments of the affected countries. The purpose of the Chernobyl Forum was to review the consequences of the accident, issue technical reports and, based on this information, to provide authoritative statements and recommendations to the Governments of Belarus, the Russian Federation and Ukraine. An additional purpose of the Forum was to provide the information in non-scientific, appropriate languages (Russian and English) to the affected populations.

Under the Forum's auspices, the WHO's Radiation and Environmental Health Programme convened a series of international scientific expert meetings. They included scientists of international repute who had been conducting research on Chernobyl. This report is the outcome of WHO's contribution to the Forum.

The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) review of the scientific literature on Chernobyl health effects published in 2000 was used in this review and updated with more recent information.

Many lessons have been learned from the Chernobyl accident and preparations have been made to respond to and mitigate future accidents. An international system of response to nuclear emergencies and radiological accidents has been established, including the WHO Radiation Emergency Medical Preparedness and Response Network.

Over the past 20 years, people in the three affected countries have come a long way in overcoming the consequences of the accident. Providing the public and key professionals with accurate information about the health and environmental consequences of the disaster should be a high priority. This report is the result of a sound scientific evaluation of the available evidence and provides a firm basis for moving forward.

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Chapter 1

GENERAL AND METHODOLOGICAL ISSUES

Introduction

The accident at the Chernobyl nuclear power plant in northern Ukraine on April 26, 1986 resulted in the release large amounts of radioactive materials, causing serious contamination of local regions and trace contamination throughout Eastern and Western Europe. These releases and subsequent transfers of radionuclides, mainly radioisotopes of caesium and iodine moving through air, water, and foods, caused radiation exposures of the workers involved in the clean up operations after the accident, those evacuated from nearby settlements, and those who continued to live in contaminated regions.

This report presents an updated review and evaluation of the health consequences of the accident that can be identified as caused by the radiation exposures from the accident in workers and the populations of the most affected regions of the former Soviet Union that are now the countries of Belarus, the Russian Federation, and Ukraine.

As background of the evaluation and a starting point for the present work, the latest review of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) in the UNSCEAR 2000 report on health effects of the accident is first summarized. This was the most recent, comprehensive evaluation of the health consequences of the accident. Since many studies are on-going or newly initiated with new information continually becoming available, an independent, updated review of all published results is necessary.

The main evidence for the presence or absence of various health outcomes is provided by epidemiological investigations. It is necessary, however, to carefully review and understand the methodological issues and limitations of these studies in order to properly interpret the results. These background issues for the present evaluation are presented in Chapter 1.

The dosimetry assumptions or methods used in exposure evaluations are also key to clarifying the strength of relationships of effects to radiation exposures. The main features of dosimetry considerations are briefly summarized in Chapter 2.

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