

# Oncologic morbidity of Chernobyl accident clean-up workers from Latvia in late period after disaster

Ivars Vanadzins<sup>1</sup>, Jelena Reste<sup>1,2</sup>, Natalja Kurjane<sup>1,2</sup>, Tija Zvagule<sup>1,2</sup>, Natalija Gabruseva<sup>2</sup>,  
Maija Eglite<sup>1,2</sup>

<sup>1</sup>Institute of Occupational Safety and Environmental Health, Riga Stradins University, Riga, Latvia

<sup>2</sup>Centre of Occupational and Radiological Medicine, Pauls Stradins Clinical University Hospital, Riga, Latvia

## Abstract

Thirty years have passed since Chernobyl nuclear power plant (CNPP) disaster where approximately 6,000 Latvian males were exposed to ionising radiation during clean-up works. At time of these works certain amount of long-living radionuclides accumulated in their bodies. After returning to Latvia they were living in radiologically relatively non-contaminated area. The **aim** of the study was to estimate tendencies of oncological morbidity of Latvian CNPP clean-up workers from year 1986 until 2010. **Materials and methods.** Data of Latvian State Register for persons exposed to ionizing radiation in Chernobyl were analysed in comparison with general oncological morbidity parameters of Latvian population. **Results.** Totally 347 cases of oncological diseases have been registered from 1986 to 2010 among 5,950 CNPP clean-up workers from Latvia, i.e. malignancy was found in every 17th person. 8 persons developed two histologically independent malignancies within time interval of several years. Mean age of affected persons at the moment of diagnosis was  $52.5 \pm 8.1$  years but at the moment of clean-up works their age was  $36.8 \pm 7.3$  years. At least 40% of all these workers have already died. Morbidity with oncological diseases increased dramatically since 2003 with its maximum in 2005, i.e. 17–19 years after exposure. During the time period between 1998 and 2010 total oncological morbidity of CNPP clean-up workers was very similar to that of general Latvian male population (SIR 0.91 and 95% CI (0.81; 1.03)) but it is important to note that 78% of all malignancies in accident clean-up workers were diagnosed at age under 60 years and only 22% at age above 60 years while in general Latvian male population incidence of cancers starts to grow significantly after the age of 55 years with maximum at 65–74 years. The highest oncologic morbidity of CNPP clean-up workers was found in age group of 40–54 years, when it significantly exceeded parameters of age and gender matched general population (SIR 1.22 and 95% CI (1.03; 1.44)). Malignancies of urogenital system (prostate, kidney, urinary bladder, testis) ranks in first place in morbidity structure (34.1% of all neoplasms). Noticeable increase in incidence of urogenital cancers started since 2000. Prostate cancer incidence statistically significantly exceeds age matched Latvian male population morbidity (SIR 2.44 and 95% CI (1.93; 3.06)). Moreover in CNPP clean-up workers of age 45–49 years the prostate cancer morbidity exceeded the parameters of general male population more than 6 times (SIR 6.25 and 95% CI (2.01; 14.59)). Malignancies of gastrointestinal organs take second place (25.8%) and tumours of respiratory organs – the third (15.4%) but incidence doesn't exceed age and gender matched Latvian population indices. Short-term increase of thyroid gland malignant tumours incidence was observed in 1996–2001 that statistically significantly exceeded age and gender matched general population indices. **Conclusions.** Our finding clearly indicates that prostate cancer in CNPP clean-up workers appears much earlier than in general population. Total oncologic morbidity of CNPP clean-up workers in age group of 40–54 years significantly

exceeded morbidity of age and gender matched general population during the period of time from 1998 till 2010 but inversely mortality due to oncologic diseases was lower than in general population in all age groups (SMR 0.9, 95% CI (0.77; 1.80)) of CNPP clean-up workers that possibly reflected effective medical care and earlier diagnostics for this group.