

Assessment of Air Pollution in Kindergartens due to Indoor Radon Concentrations

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Abstract : The World Health Organization proposes an average annual reference level of 100 Bq/m³ to minimize health risks due to radon exposure in buildings. However, if this cannot be achieved under the country's specific conditions, the chosen reference level should not exceed 300 Bq/m³. The World Health Organization recognized the relationship between indoor radon exposure and lung cancer, even at low doses. Radon in buildings is one of the most important indoor air pollutants, with harmful effects on the health of the population and especially children. This study presents the assessment of indoor radon concentration as air pollution and analyzes the exposure to radon of children and workers. Assessment of air pollution and exposure to indoor radon concentrations under the National Science Fund of Bulgaria, in the framework of grant No KII-06-H23/1/07.12.2018 in kindergartens in two districts of Bulgaria (Razgrad and Silistra). Kindergartens were considered for the following reasons: 1 these buildings are generally at the ground and/or the first floor, where radon concentration is generally higher than at upper floors; 2 these buildings are attended by children, a population generally considered more sensitive to ionizing radiation, although little data is available for radon exposure. The measurements of indoor radon concentrations were performed with passive methods (CR-39 track detectors) for the period from February to May 2015. One hundred fifty-six state kindergartens on the territories of two districts in Bulgaria have been studied. The variations of radon in the children's premises vary from 9 to 1087 Bq/m³. The established arithmetic mean value of radon levels in the kindergartens in Silistra is 139 Bq/m³ and in Razgrad 152 Bq/m³, respectively. The percentage of kindergarteners, where the radon in premises exceeds the Bulgarian reference level of 300 Bq/m³, was 19%. The exposure of children and workers in those kindergartens is high, so remediation measures of air pollution had been recommended. The difference in radon concentration in kindergartens in two districts was statistically analyzed to assess the influence of geography and geology and the difference

Keywords : air pollution, radon, kindergartens, detectors

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