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Evaluation of a potential iodine supply due to the soil cover for the inhabited rural areas subjected to iodine radioisotope contamination (the Bryansk region case study)

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A considerable fallout of iodine short-lived radioisotopes following the Chernobyl accident deposited on vast areas with different iodine supply in soils. Iodine prophylaxis in the former Soviet Union was suspended by the end of 70-ies. Iodine deficit in organism evaluated by the renal excretion was shown to contribute to the negative effect of radioiodine irradiation of the thyroid gland after the 5-year latent period (Shakhtarin et al, 2003). In our study a cartometric method for a fast expert estimation of the stable iodine geochemical background for the contaminated settlements was developed to compare the geochemical and medical data. The estimate for the four contaminated Russian regions performed earlier in the framework of the international research showed that iodine background in soils can contribute to the risk of thyroid cancer in childhood (Cardis et al., 2005). A more detailed study started in 2007 in Bryansk region known for general slight iodine deficit in rural population (Proshin, Doroshchenko, 2005). Cartometric evaluation proved considerable differentiation of 905 settlements of the Bryansk region located within the long-term radionuclide contamination zone concerning the estimated iodine supply of the soil cover. Obtained spatial variation of the stable iodine background can therefore be accounted of in the thyroid risk assessment. Proposed approach proved to be useful for: 1)the fast expert evaluation of iodine status of the inhabited areas; 2)the adequate comparison of

medical and environmental (geochemical) data; selecting settlements; 3)further experimental study, and 4)the long-term radioecological monitoring. The cartometric method was shown to be sensitive to the quality and scale of the basic soil map and the reference input data.

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