
Relationship between geological environment and health status of residents, Krupina district, Slovak Republic

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Abstract

Health status of residents in the Krupina district is one of the most unfavourable among all districts in the Slovak Republic with documented increased mortality mainly of cardiovascular diseases. It is situated in geological environment of Neogene volcanic rocks (mainly andesites, pyroclastics) that reflects in deficit contents of essential macroelements (Ca, Mg) in groundwater/drinking water and soil. Character of settlement, mainly rural, provides close relationship between residents and local environment (groundwater, soil) and supports assumption that geological environment can have significant negative health effects on residents. The improvement of health status of residents in the Krupina district is the main objective of the project LIFE FOR KRUPINA (LIFE12 ENV/SK/094). Partial goals include not only description of real status of quality of geological environment (groundwater, soil) and human health (mortality for cardiovascular and other diseases) but also realization of specific actions including biomonitoring and technological remedial measures.

Basic spatial and statistical data evaluation document deficit Ca and Mg contents in groundwater as the most important environmental indicators and increased mortality mainly for cardiovascular and oncological diseases as the most relevant health indicators. Partial results of measurement of blood vessels, used to identify level of arterial stiffness as significant risk factor for cardiovascular diseases, documented marked differences in "arterial age" of residents living in the area supplied by low mineralized soft water (T.D.S. 200-300 mg.l-1, Ca 20-30 mg.l-1, Mg 7-15 mg.l-1) and those consuming medium mineralized water with higher Ca, Mg contents (T.D.S. about 550 mg.l-1, Ca 80 mg.l-1, Mg 25-30 mg.l-1). Technological measures including addition of carbonate rock into selected local wells have been started to increase Ca and Mg contents in water sources used for drinking water supply.

Preliminary results confirm close relationship between unfavourable geological environment and health status of residents in the Krupina districts.

Keywords: geological environment, Ca and Mg deficit, groundwater, human health

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