

## Assessment of health risks with water consumption in terms of content of selected organic xenobiotics

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### ABSTRACT

The study assesses the health risk for the recipients of the selected collective water supply system in terms of consuming water containing organic xenobiotics such as: benzo[a]pyrene, polycyclic aromatic hydrocarbons, benzene, acrylamide, epichlorohydrin, vinyl chloride and 1,2-dichloroethane, which, due to their toxic, mutagenic and carcinogenic effects, pose a potential threat to human life and health. The results of water quality monitoring studies from 2012–2019 (a total of 116 concentration values were analysed from 18 water samples) conducted on treated water from the Water Treatment Plant (WTP) in southern Poland (EU), supplying water to about 100,000 inhabitants were compared with normative limits stemming from EU regulations and the US EPA and WHO recommendations. Non-carcinogenic health risk (HI) was assessed separately for adults and children under 6 years of age. In addition, carcinogenicity risk (CR) assessments were performed and safe local levels of these substances in water were estimated. The obtained values of the parameters analysed were significantly lower than the maximum allowable concentrations. The calculated HI indexes for adults were higher than those for children. The estimated carcinogenic risk was approximately 27% of the allowable risk level. It was shown that the determined concentrations of xenobiotics present in the water analysed are safe for the health of recipients who have used the water supply system for many years.

**Keywords:** Drinking water; Carcinogenic and non-carcinogenic health risk; Benzene; PAH; benzo[a]pyrene; Acrylamide; Epichlorohydrin; Vinyl chloride; 1,2-dichloroethane

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