

ASSESSING THE RISK OF AN EXCESSIVE FLUORIDE INTAKE IN A REGION OF SOUTHEASTERN SWEDEN

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SUMMARY: Severe dental fluorosis has been historically documented among children in southeastern Sweden (Forsman, 1974). Fluorine occurs as a natural component in the bedrock in this region, giving rise to the elevated water fluoride in both surface and ground waters (well above 1.5 mg/L) e.g. the granite rocks, associated fracture veins and overlying soils contain important sources such as minerals fluorite, biotite and muscovite (Berger et al. 2012). Today, a large proportion of the population obtains municipality-controlled drinking water following WHO recommendations of 1.5 mg/L. However, out of nearly 4800 investigated private water wells 24 % showed levels above this value. In this study (Augustsson and Berger, 2014), we compared this value to the risk of an excessive fluoride intake based on tolerable daily intake (US EPA RfD 0.06 mg/kg-day) using a probabilistic approach. We estimated that the number of children to potentially be at risk now increased to 48 % (only drinking water), and 78 % when all exposure factors and their variability was considered. Notably, toothpaste ingestion was of greater importance than drinking water in more than half of the predicted scenarios. This illustrates 1, how risk characterization is affected by the basis of comparison 2, that much of the total exposure may be overlooked when only focusing on one exposure pathway and 3, it shows the importance of considering the variability in all relevant pathways.

Key words: Sweden, dental fluorosis, drinking water, exposure assessment

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