

- Title** Community Water Fluoridation Programs: A Health Technology Assessment
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- Reference** Community Water Fluoridation Programs: A Health Technology Assessment — Review of Dental Caries and Other Health Outcomes. Ottawa: CADTH; 2019 Feb. (CADTH technology review; no. 12). Available from: <https://cadth.ca/community-water-fluoridation-programs-health-technology-assessment>

Aim

The objective of this health technology assessment (HTA) was to provide an analysis of the health outcomes, cost considerations, implementation issues, environmental impact, and ethics of adopting, maintaining, or discontinuing community water fluoridation (CWF) in Canada, so as to guide relevant discussions and decisions at the municipal level.

Conclusions and Results

Regarding health outcome benefits, the evidence suggests that CWF reduces dental caries in both deciduous (temporary) and permanent teeth in children and in permanent teeth in adults. There is insufficient evidence to determine how the prevalence of dental caries changes when CWF is discontinued. Regarding harms, the evidence suggests there is no association between the levels of CWF typically found in Canada and the incidence of bone cancer, all cancers, hip fracture, Down syndrome, intelligence quotient, or cognitive function. There is insufficient evidence to draw any conclusions regarding the effect of adopting, maintaining, or discontinuing CWF on other health outcomes. From a societal perspective, financial savings may be realized by introducing CWF in an urban municipality, while discontinuing CWF may be associated with financial losses. The environmental impact analysis suggests that fluoride from CWF enters exposure source media (such as groundwater or soil) at a concentration too low to be considered harmful to ecological receptors. While acknowledged to impinge upon the autonomy of municipal residents receiving CWF without their explicit consent, the ethics analysis concludes that adopting or maintaining CWF is ethically justified because it improves public oral health with few harms and side effects. There is insufficient evidence to form any meaningful conclusions on the ethics of discontinuing CWF. Issues relevant to access, distribution, and oral health disparity in the local context must be considered in making decisions involving adoption, maintenance, or discontinuation of CWF. Given the continuously changing landscape of water fluoridation and variation in perspectives and interests of stakeholders related to these topics, limited conclusions can be made at a pan-Canadian level about implementation challenges, enablers, and other considerations. There are several limitations to the evidence assessed in this HTA; therefore, caution is warranted in applying the findings.

Methods

The HTA included a review of the published literature on the health outcomes of adopting or discontinuing CWF. It also included two budget impact analyses; a review of the main relevant implementation challenges, enablers, and other considerations; an environmental impact analysis; and a review of the main ethical issues and the broader legal, social, and cultural considerations of adopting, maintaining, or discontinuing CWF.

The systematic review of the health outcomes related to CWF use or discontinuation consisted of an update of two reviews that were published in 2016. The budget impact analyses were conducted from a societal perspective, using a twenty-year time horizon, for permanent residents of an average large urban municipality. The assessment of the main implementation challenges, enablers, and other considerations involved applying the INTEGRATE Context and Implementation of Complex Interventions framework to information obtained from a review of the published and grey literature, as well as consultations with stakeholders on policies and practices relevant to dental care. The environmental impact analysis involved an evaluation of the published and grey literature on the effects of fluoride exposure on non-human organisms. Finally, the ethical analysis involved an evaluation of the empirical and normative bioethics literature and a *de novo* ethical analysis of the attendant gaps identified in the literature.

Further Research/Reviews Required

Further high-quality primary research in a Canadian context is needed to assess the impact of adopting or discontinuing CWF on the health outcomes of subsets of the population (based on age, socioeconomic status, education, and more), in addition to the financial impact across various municipality sizes. Researchers may consider actively enrolling Indigenous populations in future studies, as well as investigating possible links between prenatal fluoride exposure and deciduous dental health.

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