Is water fluoridation still a viable option for caries prevention in South Africa?

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Despite a Commission of Inquiry into water fluoridation recommending the fluoridation of public water supplies to the optimal fluoride concentration of 0.7 ppm, as well as regulations for the introduction of water fluoridation which compel water providers to fluoridate public water supplies, no artificially fluoridated water scheme exists in South Africa. In view of concerns expressed by South African local authorities about cost and reports urging further investigation into the effectiveness of water fluoridation, the aim of this study was to determine whether water fluoridation is still a viable option to reduce dental caries in South Africa.

A computerised model which requires twenty-four input variables was populated with 2006 and 2010 data. Per capita cost, cost-effectiveness and cost-benefit were calculated as economic outputs to facilitate decision making for projected caries reductions of 15%, 30% and 50%.

The average per capita cost of water fluoridation for all category water providers combined is $0.28 in 2006 and $0.34 in 2010, an increase of 22.2% over this period. The average cost-effectiveness for all water providers combined varies from $3.28 for a 50% to $10.92 for a 15% caries reduction. Despite higher cost-effective values for some cities and towns, the cost per person per year to save one DMFT at a projected caries reduction of at least 15% as a result of the introduction of water fluoridation, is at least 45.7% less than the cost of a two surface restoration. The average cost-benefit for all water providers combined varies from 0.11 at a 50% to 0.36 at a 15% caries reduction. For both cost-effectiveness and cost-benefit better results are achieved when the projected caries reduction increases.