

ECONOMIC EVALUATION ON DENTAL CARIES PREVENTIVE INTERVENTIONS FOR AUSTRALIAN CHILDREN

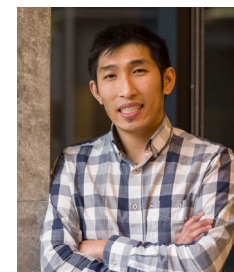
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BACKGROUND

Dental caries is one of the most prevalent health conditions, globally.

Using a priority-setting approach, this study aims to economically evaluate three preventive interventions for dental caries among Australian children from low household income.

The interventions included:

1. anticipatory guidance provided by oral health therapists via 1a) home visits or 1b) telehealth consultations;
2. school-based dental screening and fluoride varnish program delivered by 2a) dental practitioners or 2b) non-dental health professionals (no screening); and
3. school-based fissure sealant program.

METHODS

The healthcare perspective was taken.

Modelling adapted from the previously published dental caries model (Nguyen et al., 2023).

The base-case scenario included intervention and dental treatment costs, with six-year (1a and 1b) and two-year (2a, 2b and 3) time horizons.

Sensitivity analysis included other healthcare costs (e.g. pulp therapy, extractions, etc.).

Extrapolation modelling was extended to the 12-year time horizon (all interventions).

Willingness-to-pay threshold applied the AUD\$50,000 per disability-adjusted life year (DALY) averted, and AUD\$28,033 per quality-adjusted life year gained.

RESULTS

Economic modelling results are reported in Table 1.

Base-Case Scenario	Incremental Cost-Effectiveness Ratio				
	AUD\$ / DT Prevented	AUD\$ / DALY Averted	CE	AUD\$ / QALY Gained	CE
Home Visits	3,010	54.5 x 10 ⁶	0%	9.5 x 10 ⁶	0%
Telehealth	2,067	37.2 x 10 ⁶	0%	6.6 x 10 ⁶	0%
Dental screening and fluoride varnish	882	11.4 x 10 ⁶	0%	2.0 x 10 ⁶	0%
Fluoride varnish delivered by non-dental health professionals	532	6.9 x 10 ⁶	0%	1.2 x 10 ⁶	0%
Dental screening and fissure sealant	5,651	82.2 x 10 ⁶	0%	14.4 x 10 ⁶	0%
Sensitivity Analysis [^]					
Including Other Healthcare Costs					
Home Visits	1,680	30.4 x 10 ⁶	0.1%	5.3 x 10 ⁶	0.1%
Telehealth	733	13.2 x 10 ⁶	7.2%	2.3 x 10 ⁶	7.3%
Dental screening and fluoride varnish	778	10.1 x 10 ⁶	0%	1.8 x 10 ⁶	0%
Fluoride varnish delivered by non-dental health professionals	428	5.6 x 10 ⁶	0.1%	1.0 x 10 ⁶	0.1%
Dental screening and fissure sealant	5,544	80.6 x 10 ⁶	0%	14.1 x 10 ⁶	0%
Sensitivity Analysis [^]					
12 Year Time Horizon					
Home Visits	523	8.7 x 10 ⁶	2.2%	1.5 x 10 ⁶	2.2%
Telehealth	132	2.2 x 10 ⁶	28.7%	0.4 x 10 ⁶	29.8%
Dental screening and fluoride varnish	~0	1,988	43.9%	348	48.6%
Fluoride varnish delivered by non-dental health professionals	-84 [#]	-663,657 [#]	91.5%	-110,984 [#]	94.7%
Dental screening and fissure sealant	104	737,176	17.1%	129,035	20.0%

[^] includes costs of potentially preventable dental hospitalisation and general anaesthesia for children <7 years old and other healthcare costs related to dental caries; AUD\$ = 2020 Australian dollars; DT = decayed teeth; DALY = disability-adjusted life years; QALY = quality-adjusted life years; CE = probability intervention is cost-effective (AUD\$50,000 per DALY averted and AUD\$28,033 per QALY gained); ~ approximately; # dominant.

Table 1 The incremental cost-effectiveness ratio and the probability for cost-effectiveness for the three dental caries preventive intervention targeting children at higher risk in Australia (discounted).

None of the interventions were cost-effective for the base-case scenario.

Cost-effectiveness did not significantly vary under sensitivity analysis when including other healthcare costs.

Cost-effectiveness results was sensitive to extrapolation modelling with the 12-year time horizon.

Interventions in order of ranking on the probability for cost-effectiveness were:

1. Fluoride varnish delivered by non-dental health professionals
2. Dental screening and fluoride varnish
3. Anticipatory guidance via telehealth
4. Dental screening and fissure sealant
5. Anticipatory guidance via home visits

CONCLUSIONS

Three preventive interventions for dental caries modelled in this study were found not to be cost-effective with the base-case scenario. Results were sensitive when including other healthcare costs and applying the 12-year time horizon.

References

Nguyen TM, Tonmukayakul U, Khanh-Dao Le L, Singh A, Lal A, Ananthapavan J, Calache H, Mihalopoulos C. Modeled health economic and equity impact on dental caries and health outcomes from a 20% sugar sweetened beverages tax in Australia. Health Econ. 2023 Nov;32(11):2568-2582. doi: 10.1002/hec.4739.