

Community-based interventions

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The intervention

- Community based interventions (CBIs) were defined as a co-ordinated program of community-level strategies to promote both healthy eating and physical activity at the population-level.
- This analysis explored implementation of CBIs across all local government areas (LGAs) in Australia.

What we already know

- Systematic reviews have shown that CBIs can be effective in preventing unhealthy weight gain especially in school aged children.
- Best-practice recommendations indicate that CBIs should include multiple strategies, have multiple components, be implemented in multiple settings, and target both physical activity and nutrition.
- CBIs have been supported, funded and delivered by all levels of government in Australia.
- The limited evidence available suggests that CBIs can be cost-effective.

Key elements of the modelled intervention

- A meta-analysis of 10 quasi-experimental trials was undertaken to assess the effectiveness of CBIs, reported as a change in BMI (body mass index) z-score.
- The population modelled was primary and secondary school children (5-18 years).
- Individual components of several CBIs were costed to estimate the average cost of each component. A generic CBI was costed based on several components including administration, capacity building, awareness raising, three school-based physical activity and four nutrition strategies, plus wider community actions. Costs were applied across the 577 LGAs in Australia, with each assumed to have 10 schools implementing the CBI.
- Sensitivity analyses investigated the impact on primary school children only (aged 5-12 years), and explored a best case scenario with lower intervention intensity coupled with a larger BMI effect.

Key findings

- The cost of implementing CBIs across all LGAs in Australia was estimated to be AUD878M over three years, and was estimated to save approximately \$452M in healthcare costs.
- CBIs were predicted to result in 51,792 HALYs gained over the lifetime of the cohort. The mean ICER was \$8,155 per HALY gained with a 95% probability of being cost-effective.
- Scenario analyses showed that the intervention was more cost-effective when the best case scenario was applied, and was dominant when limited to primary school children.

Conclusion

CBIs are likely to be cost-effective obesity prevention initiatives. CBIs are equitable and are strongly supported by evidence of effectiveness; however, the feasibility of implementing CBIs across all Australian LGAs is questionable due to its relatively large budget impact.

Scenarios description and cost-effectiveness results

Table 1 Description of selected scenarios

	Base case Interventions in primary and secondary schools	Scenario 1 Interventions in primary schools only	Scenario 2 Best case
Risk factor(s) addressed by intervention	BMI		
Population targeted	5 to 18 year olds	5 to 11 year olds	5 to 18 year olds
Reduction in BMI z-score MD (95% UI)	0.07 (0.01 to 0.13)	0.12 (0.01 to 0.23)	0.08 (0.02 to 0.15)*
Effect decay	100% maintenance of effect		
Costs included	Costs for average CBIs in both primary and secondary schools	Costs for average CBIs in just primary schools	Less intensive CBIs in both primary and secondary schools
Type of model used	Child matrix model		
Notes: BMI: Body mass index; CBI: community-based intervention; MD: mean difference; UI: uncertainty interval * Effect size estimated from meta-analysis results where only studies reporting adjusted mean differences were included.			

Table 2 Cost-effectiveness results, mean (95% UI)

	Base case	Scenario 1	Scenario 2
Total HALYs gained	51,792 (6,816 to 96,972)	98,754 (7,675 to 186,244)	58,331 (10,103 to 108,728)
Total intervention costs	\$878M (\$794M to \$963M)	\$716M (\$645M to \$792M)	\$743M (\$668M to \$820M)
Total healthcare cost savings	\$452M (\$58M to \$854M)	\$887M (\$78M to \$1,661M)	\$509M (\$92M to \$941M)
Total net cost *	\$426M (\$3M to \$823M)	-\$170M (-\$931M to \$640M)	\$234M (-\$198M to \$651M)
Mean ICER (\$/HALY gained)	8,155 (237 to 81,021)	Dominant (Dominant to 30,448)	4,012 (Dominant to 62,271)
Probability of being cost-effective #	95%	97%	97%
Overall result	Cost-effective	Dominant	Cost-effective
Notes: Dominant: the intervention is both cost-saving and improves health; HALY: health adjusted life year; ICER: incremental cost effectiveness ratio; M: million; \$ 2010 Australian dollars; * Negative total net costs equate to cost savings. # The willingness-to-pay threshold for this analysis is \$50,000 per HALY.			

Figure 1 Cost–effectiveness plane

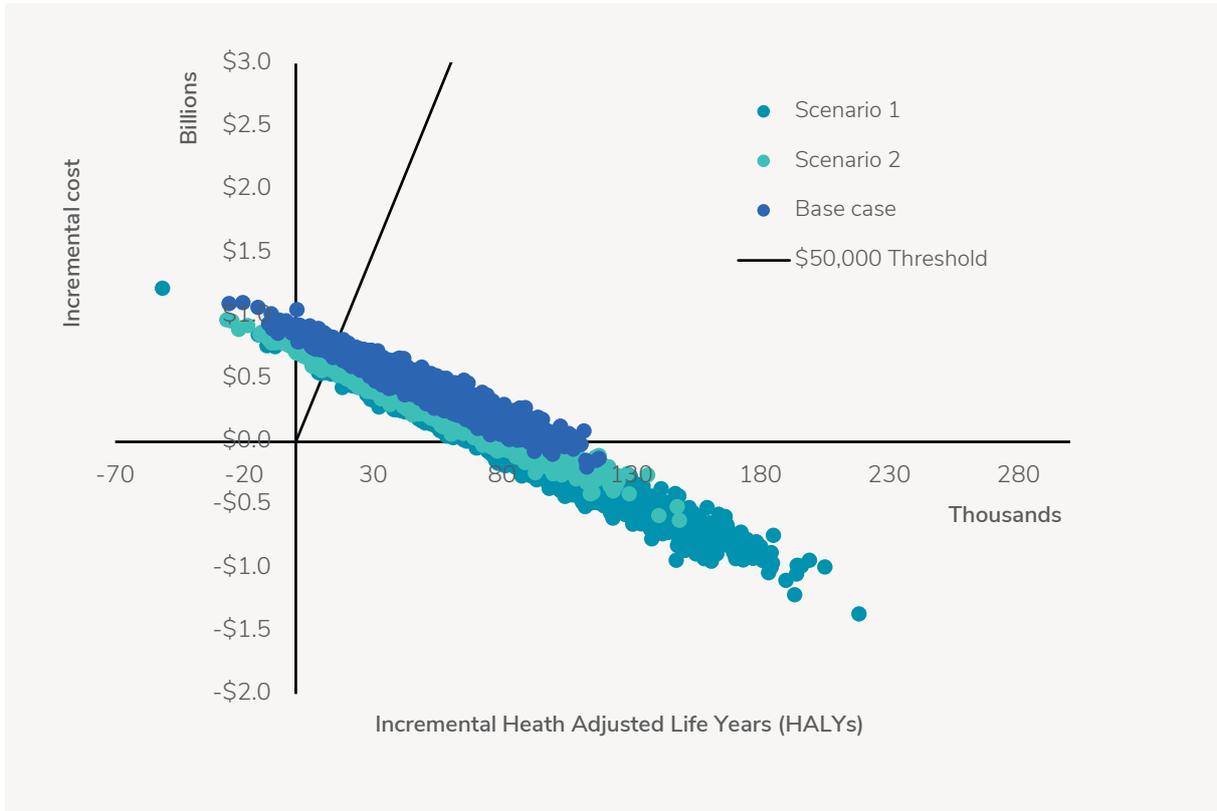
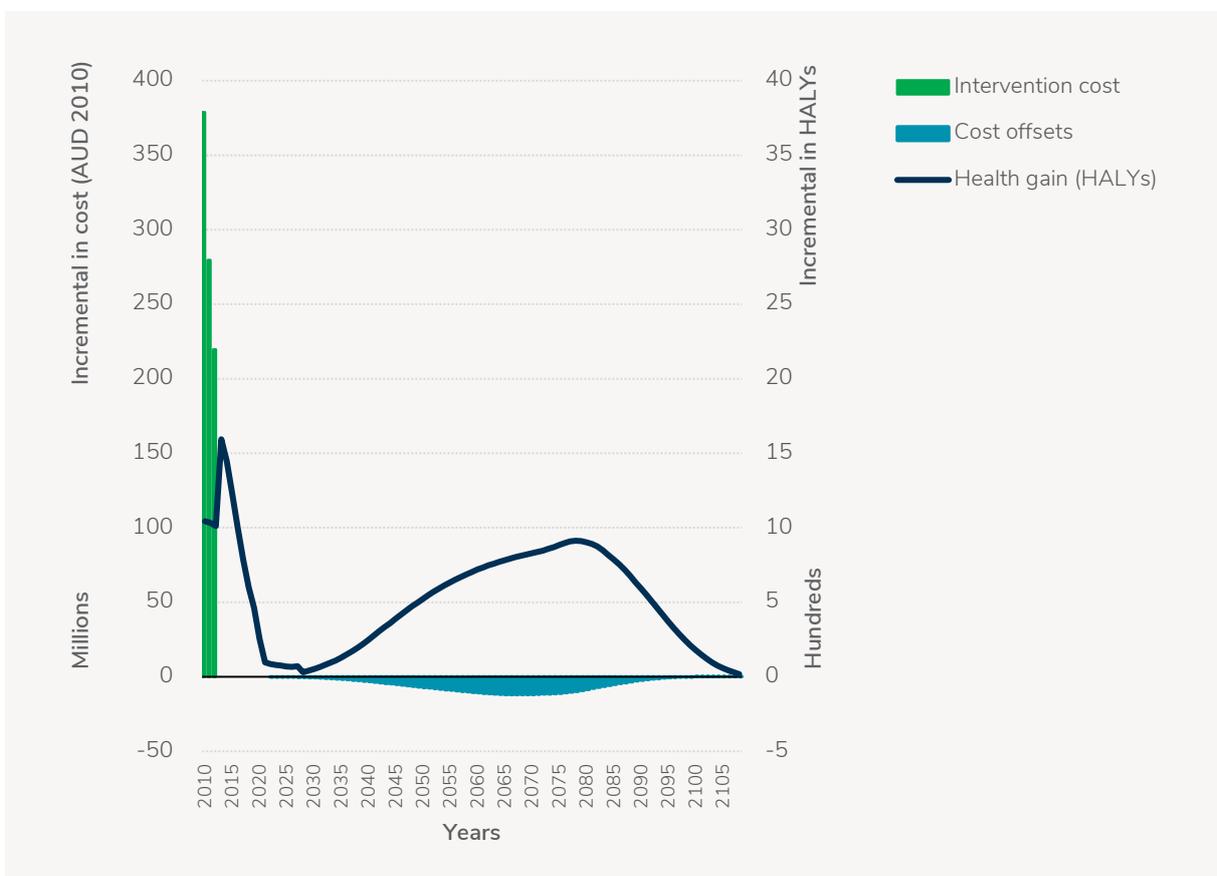


Figure 2 Costs, cost offsets and health gains over time (base case)



Implementation considerations

Consideration	Details	Assessment
Strength of evidence	High certainty of effect for BMI outcomes based on systematic reviews of RCTs. The effect size for this intervention was estimated from a meta-analysis of 10 quasi-experimental studies.	High
Equity	Studies have found that CBIs could prevent the widening of inequalities in obesity. However, our modelling shows a considerable financial contribution from individuals that could preclude some students from lower income families participating, potentially resulting in negative equity impacts. The specific strategies implemented could be tailored to the socio-economic profile of the community, and could include subsidies.	Neutral
Acceptability	Government: CBIs align well with state and local governments' policy objectives related to encouraging healthy eating and physical activity in childhood. In 2013, approximately 104 CBIs had been implemented around Australia. The highest proportion (30%) were implemented in Victoria as part of the Healthy Together Victoria initiative, followed by New South Wales (19%), South Australia (14%) and Queensland (10%).	High
	Industry: There is evidence that CBIs have been successful in engaging local industry partners.	High
	Public: Highly participatory methods for the design and implementation of CBIs are likely to boost acceptability and participation. There may nonetheless be some concern around affordability for families to participate in CBI activities (e.g. payment for afterschool sports activities).	High
Feasibility	The widespread implementation of CBIs is evidence of their feasibility in a range of contexts. The relatively high implementation cost (compared with current investment in prevention) may lower feasibility of national implementation. However, a staged implementation plan may assist in increasing feasibility.	Medium
Sustainability	The effectiveness of CBIs are dependent on the continuous review, evaluation and modification of CBI strategies. However, there is evidence of effective CBIs 12 years post-commencement. Intervention sustainability is highly dependent on funding and engagement of key community members, especially within schools.	Medium
Other considerations	Positive side effects: CBIs may have "spill-over" effects on neighbouring communities who implement aspects of the intervention. CBIs could help create new social norms around nutrition and physical activity. This evaluation estimated the impact of CBIs on school aged children. It is likely that there will be wider positive impacts on all members of the community. There are also likely to be benefits related to community cohesion and empowerment.	
Notes: BMI: body mass index; CBIs: community-based interventions; RCT: randomized controlled trial		