Fuel excise: 10 cent per litre increase

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The intervention

- The intervention was defined as a $0.10 per litre increase to the existing national fuel excise tax. The proportional amount of fuel excise tax levied would still be less than in countries such as Switzerland, the Netherlands and the United Kingdom.

What we already know

- Limited evidence on the effect of policies such as fuel taxation on health-related behaviours currently exists.
- Increasing the relative cost of driving through an increase in fuel taxation may increase rates of active transport (defined as walking, cycling and using public transport), thereby decreasing population prevalence of obesity and other diseases where physical inactivity is a risk factor.

Key elements of the modelled intervention

- Given limited data on transport behaviours, the intervention population was defined as the working age population (18-64 years). The impact of commuting modal switch from private motor vehicle to public transport (PT) was modelled as a hypothetical result of the intervention.
- Intervention effectiveness was based on conservative estimates of cross-price elasticity of demand for PT with respect to fuel price, distance walked to access PT and metabolic equivalent task (MET) values. A "plausible case" was then modelled using less conservative, but still plausible, inputs.
- Costs included legislative costs, with compliance and administrative burdens estimated as relatively low. Vehicle operating cost-savings were estimated and reported separately.

Key findings

- The intervention would cost $4.4M to implement.
- Under conservative assumptions, the intervention would result in a population weighted mean increase in physical activity of 0.1 MET minutes per week, and weighted mean BMI reduction of 0.0002kg/m^2. The intervention would be cost-effective, resulting in 237 HALYs gained and total healthcare cost-savings of $2.6M over the lifetime.
- Under "plausible case" assumptions, the intervention would result in a larger increase in physical activity (0.8 MET minutes per week) and population weighted mean BMI reduction (0.002kg/m^2). The intervention would be more cost-effective, resulting in 3,181 HALYs gained and total healthcare cost-savings of $34.2M.

Conclusion

The intervention demonstrates potential for cost-effectiveness, but the analysis is limited in terms of quality of evidence of effect and sustainability of effect. Concerns around equity and acceptability would need to be addressed.

Scenarios description and cost-effectiveness results

Table 1 ***Description of selected scenarios***

	Base case Conservative input parameters to model to intervention effect	Scenario 1 Conservative input parameters to model to intervention effect - BMI effect only	"Plausible case" Less conservative, but still plausible, input parameters to model to intervention effect
Risk factor(s) addressed by intervention	BMI/PA/Injury	BMI	BMI/PA/Injury
Population targeted	Australian working population, aged 18-64 years		
Weighted average reduction in BMI (95% UI)	0.0002kg/m^2 (0.0001 to -0.0003)		0.002kg/m^2 (0.001 to 0.003)
Weighted average reduction in PA, MET mins/week (95% UI)	0.1 (0.001 to 0.11)	N/A	0.8 (0.6 to 0.9)
Effect decay	100% maintenance of effect		
Costs included	Cost of legislation. Vehicle operating cost-savings reported separately.		
Type of model used	Population model with quality of life in children		

Notes: BMI: Body mass index; kg: kilogram; m: metre; MET: metabolic equivalent task; mins: minutes; PA: physical activity; UI: uncertainty interval

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

	Base case	Scenario 1	"Plausible case"
Total HALYs gained	237 (138 to 351)	195 (85 to 314)	3,181 (1,797 to 4,633)
Total intervention costs	$4M ($3M to $5M)		
Total healthcare cost savings	$2M ($1M to $4M)	$2M ($962,352 to $4M)	$34M ($17M to $51M)
Total net cost *	$2M ($1M to $3M)	$2M ($1M to $3M)	-$30M (-$47M to -$14M)
Mean ICER ($/HALY gained)	7,684 (7,617 to 10,919)	10,568 (3,700 to 52,684)	Dominant (Dominant to Dominant)
Probability of being cost-effective #	99%	99%	100%
Overall result	**Cost-effective**	**Cost-effective**	**Dominant**

*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*

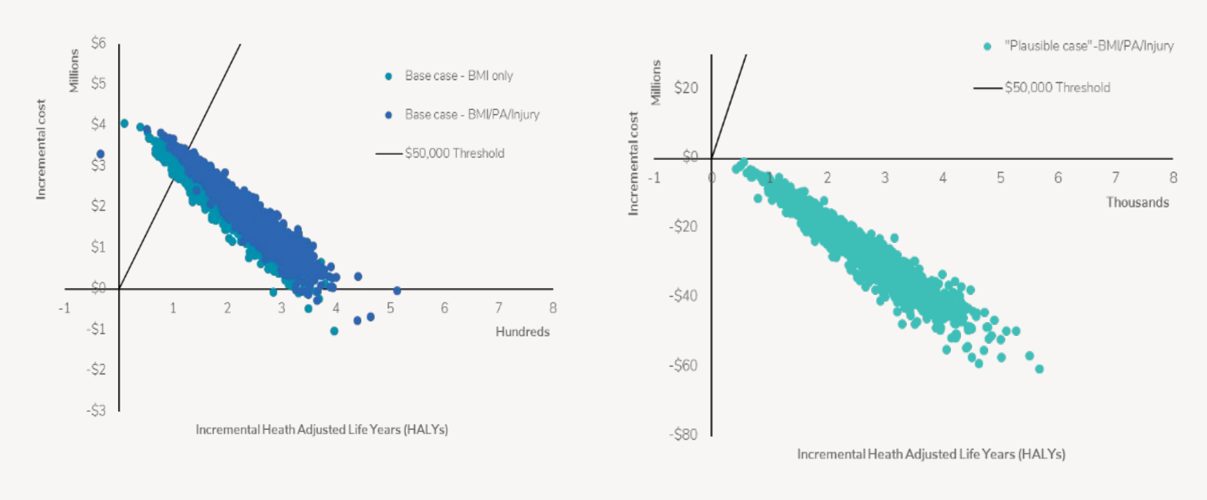
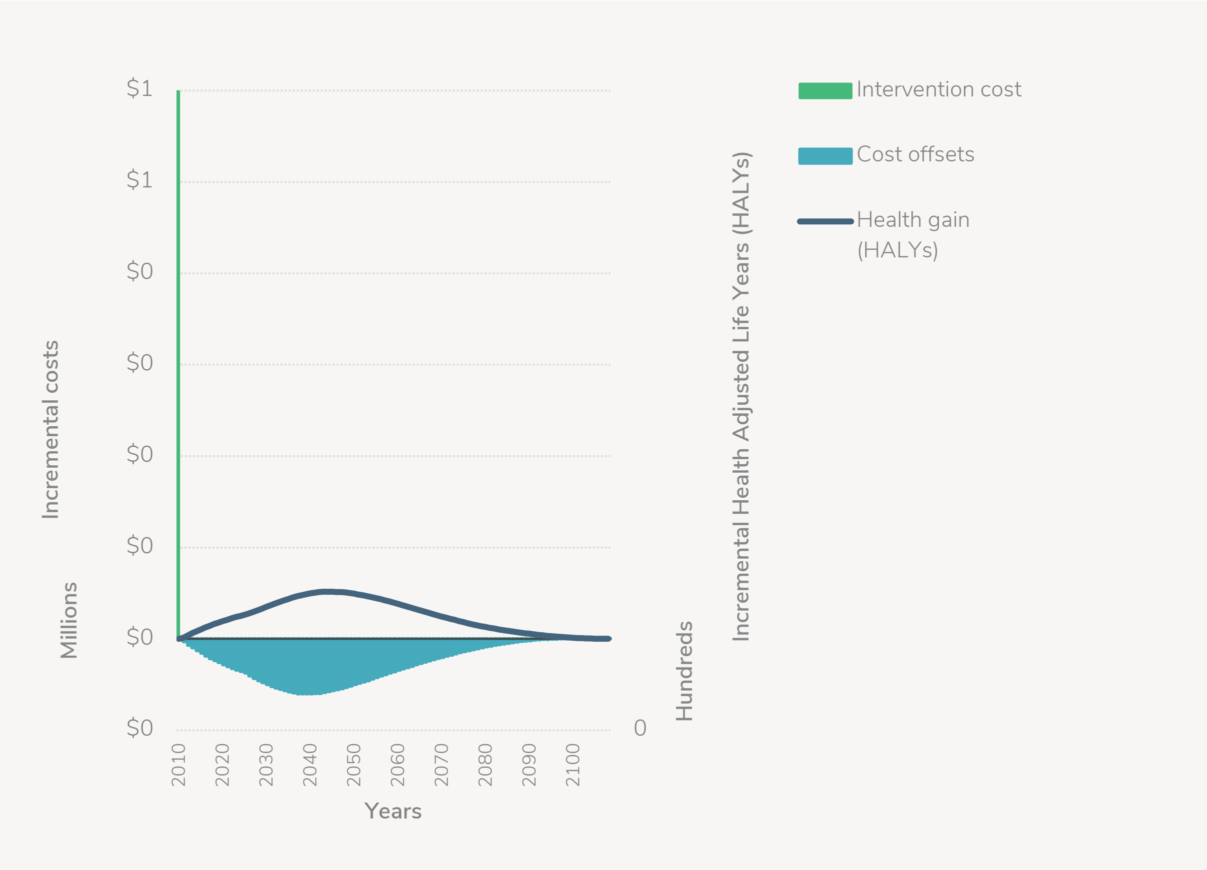


Figure 2 *Costs, cost offsets and health gains over time*



Implementation considerations

Consideration	Details	Assessment
Strength of evidence	Low certainty of effect for BMI outcomes due to absence of relevant studies.	**Low**
	Low certainty of effect for PA outcomes. Quantity and quality of evidence supporting association between fuel price or taxation and active transport is limited. PA effect modelled using estimates of cross price elasticity of demand for public transport, with respect to fuel price. All results based on hypothetical scenarios using best available evidence.	**Low**
Equity	Disproportionate burden of tax across low, middle and high income households. Middle income households most affected as a proportion of overall weekly household expenditure. High income households least affected as proportion of overall weekly expenditure. Evidence suggests that public transport is less accessible for persons with disabilities, the elderly, those living in areas not well-serviced by comprehensive networks and those from disadvantaged backgrounds.	**Negative**
Acceptability	**Government:** Fuel excise taxation is already levied by the Australian government, however government acceptability for this intervention is expected to be low given low public acceptability of rising fuel prices.	**Low**
	Industry: Fuel excise, with bi-annual indexation, already occurs within Australia at the point of production/import. Relatively few producers/importers exist.	**Medium**
	Public: Automotive fuels are relatively own-price elastic, and public acceptability of any increase in fuel price is expected to be low.	**Low**
Feasibility	This legislative intervention is feasible to implement in the Australian setting.	**High**
Sustainability	Given its legislative nature, the intervention is sustainable.	**High**
Other considerations	**Positive side effects:** Potential for less traffic, pollution, safer environments for pedestrians and cyclists. **Negative side effects:** Potential strain on public transport systems in the short term, whilst capacity is improved.	
Note: BMI: Body Mass Index; PA: physical activity.		