# Health impacts of transport: modelling scenarios

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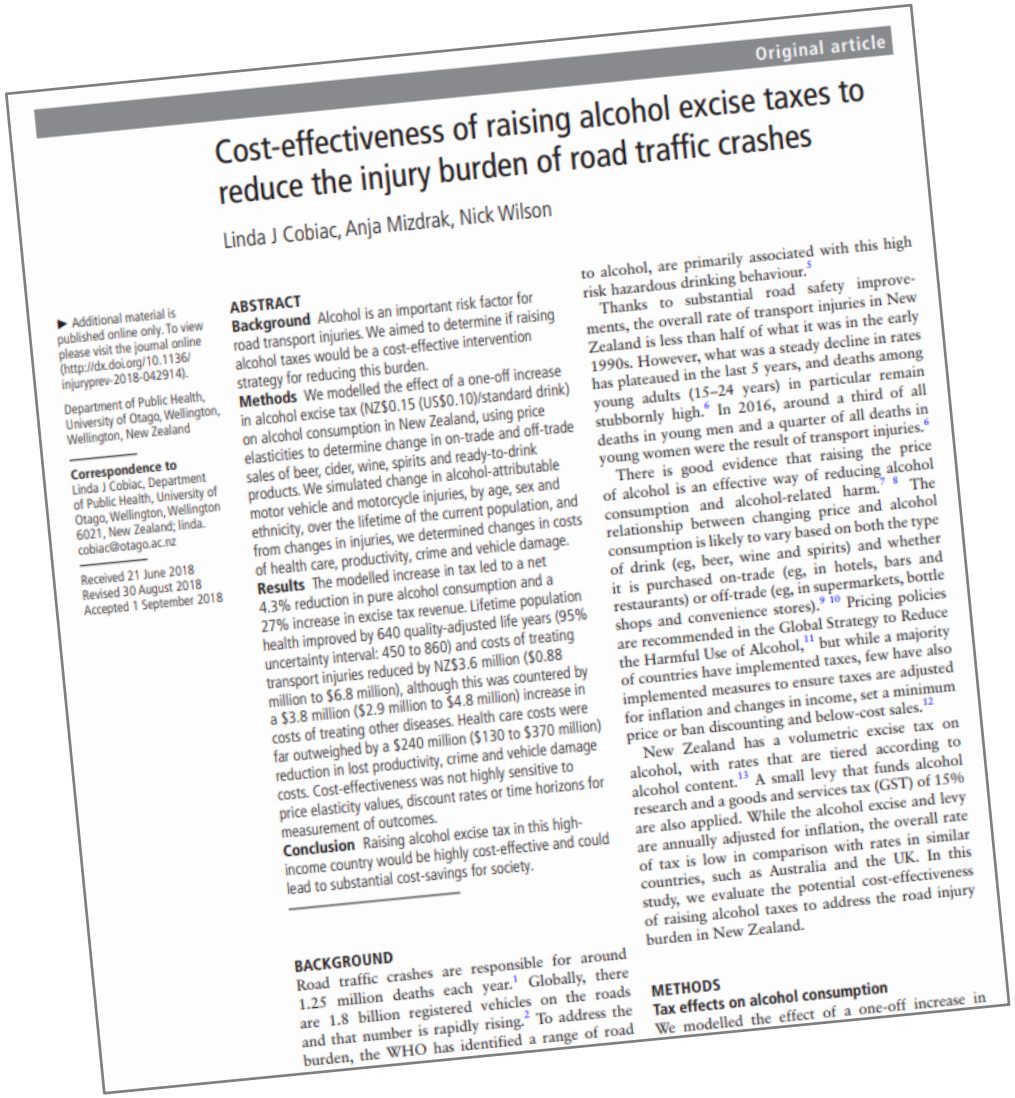
# Outline

- Completed
  - Alcohol tax
- In progress
  - Active transport
- Future
  - Social impacts



Original article

Cost-effectiveness of raising alcohol excise taxes to reduce the injury burden of road traffic crashes

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**ABSTRACT**

**Background** Alcohol is an important risk factor for road transport injuries. We aimed to determine if raising alcohol taxes would be a cost-effective intervention strategy for reducing this burden.

**Methods** We modelled the effect of a one-off increase in alcohol excise tax (NZ$0.15 (US$0.10)/standard drink) on alcohol consumption in New Zealand, using price elasticities to determine change in on-trade and off-trade sales of beer, cider, wine, spirits and ready-to-drink products. We simulated change in alcohol-attributable motor vehicle and motorcycle injuries, by age, sex and ethnicity, over the lifetime of the current population, and from changes in injuries, we determined changes in costs of health care, productivity, crime and vehicle damage.

**Results** The modelled increase in tax led to a net 4.3% reduction in pure alcohol consumption and a 27% increase in excise tax revenue. Lifetime population health improved by 640 quality-adjusted life years (95% uncertainty interval: 450 to 860) and costs of treating transport injuries reduced by NZ$3.6 million ($0.88 million to $6.8 million), although this was countered by a $3.8 million ($2.9 million to $4.8 million) increase in costs of treating other diseases. Health care costs were far outweighed by a $240 million ($130 to $370 million) reduction in lost productivity, crime and vehicle damage costs. Cost-effectiveness was not highly sensitive to price elasticity values, discount rates or time horizons for measurement of outcomes.

**Conclusion** Raising alcohol excise tax in this high-income country would be highly cost-effective and could lead to substantial cost-savings for society.

**BACKGROUND**

Road traffic crashes are responsible for around 1.25 million deaths each year.[1] Globally, there are 1.8 billion registered vehicles on the roads and that number is rapidly rising.[2] To address the burden, the WHO has identified a range of road to alcohol, are primarily associated with this high risk hazardous drinking behaviour.[5]

Thanks to substantial road safety improvements, the overall rate of transport injuries in New Zealand is less than half of what it was in the early 1990s. However, what was a steady decline in rates has plateaued in the last 5 years, and deaths among young adults (15–24 years) in particular remain stubbornly high.[6] In 2016, around a third of all deaths in young men and a quarter of all deaths in young women were the result of transport injuries.[6]

There is good evidence that raising the price of alcohol is an effective way of reducing alcohol consumption and alcohol-related harm.[7 8] The relationship between changing price and alcohol consumption is likely to vary based on both the type of drink (eg, beer, wine and spirits) and whether it is purchased on-trade (eg, in hotels, bars and restaurants) or off-trade (eg, in supermarkets, bottle shops and convenience stores).[9 10] Pricing policies are recommended in the Global Strategy to Reduce the Harmful Use of Alcohol,[11] but while a majority of countries have implemented taxes, few have also implemented measures to ensure taxes are adjusted for inflation and changes in income, set a minimum price or ban discounting and below-cost sales.[12]

New Zealand has a volumetric excise tax on alcohol, with rates that are tiered according to alcohol content.[13] A small levy that funds alcohol research and a goods and services tax (GST) of 15% are also applied. While the alcohol excise and levy are annually adjusted for inflation, the overall rate of tax is low in comparison with rates in similar countries, such as Australia and the UK. In this study, we evaluate the potential cost-effectiveness of raising alcohol taxes to address the road injury burden in New Zealand.

**METHODS**

**Tax effects on alcohol consumption**

We modelled the effect of a one-off increase in

# Alcohol tax

- Intervention
  - one-off increase in alcohol excise tax ($0.15/standard drink)
- Impact
  - costs of treating transport injuries reduced by $3.6 million ($0.88m to $6.8m)
  - $3.8 million ($2.9m to $4.8m) increase in costs of treating other diseases.
  - $240 million ($130m to $370m) reduction in lost productivity, crime and vehicle damage
  - Increased revenue ($370 million)

# Active transport