Health benefits and cost savings of sugar and sugary drinks taxes in NZ

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Take home messages

- A sugary drink tax is modelled to generate modest health gains and cost savings to the health system

  Up to 137,000 QALYs

  Up to $2.2 billion cost savings

- A sugar tax is modelled to generate large health gains and cost savings to the health system

  2.6 million QALYs

  $36.5 billion cost savings

- Both could contribute to a reduction in ethnic health inequities

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Methods

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Taxes and subsidies

- 3.4% Δ in price due to a 20% fruit and vegetable subsidy

- Taxes were matched to this 3.4%

  → so if a tax and the F&V subsidy were combined no change in food expenditure should occur

  → Sugar tax: $0.72 per 100 g sugar

Citation: Blakely, T., Cleghorn, C., Mizdrak, A., Waterlander, W., Nghiem, N., Swinburn, B., Wilson, N. and Mhurchu, C.N., 2020. The effect of food taxes and subsidies on population health and health costs: a modelling study. The Lancet Public Health, 5(7), pp.e404-e413.

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Price Elasticities

- Own price elasticities:

  Δ price → Δ purchasing/ consumption

- Cross price elasticities:

  Δ price → Δ purchasing/ consumption

Price Elasticities
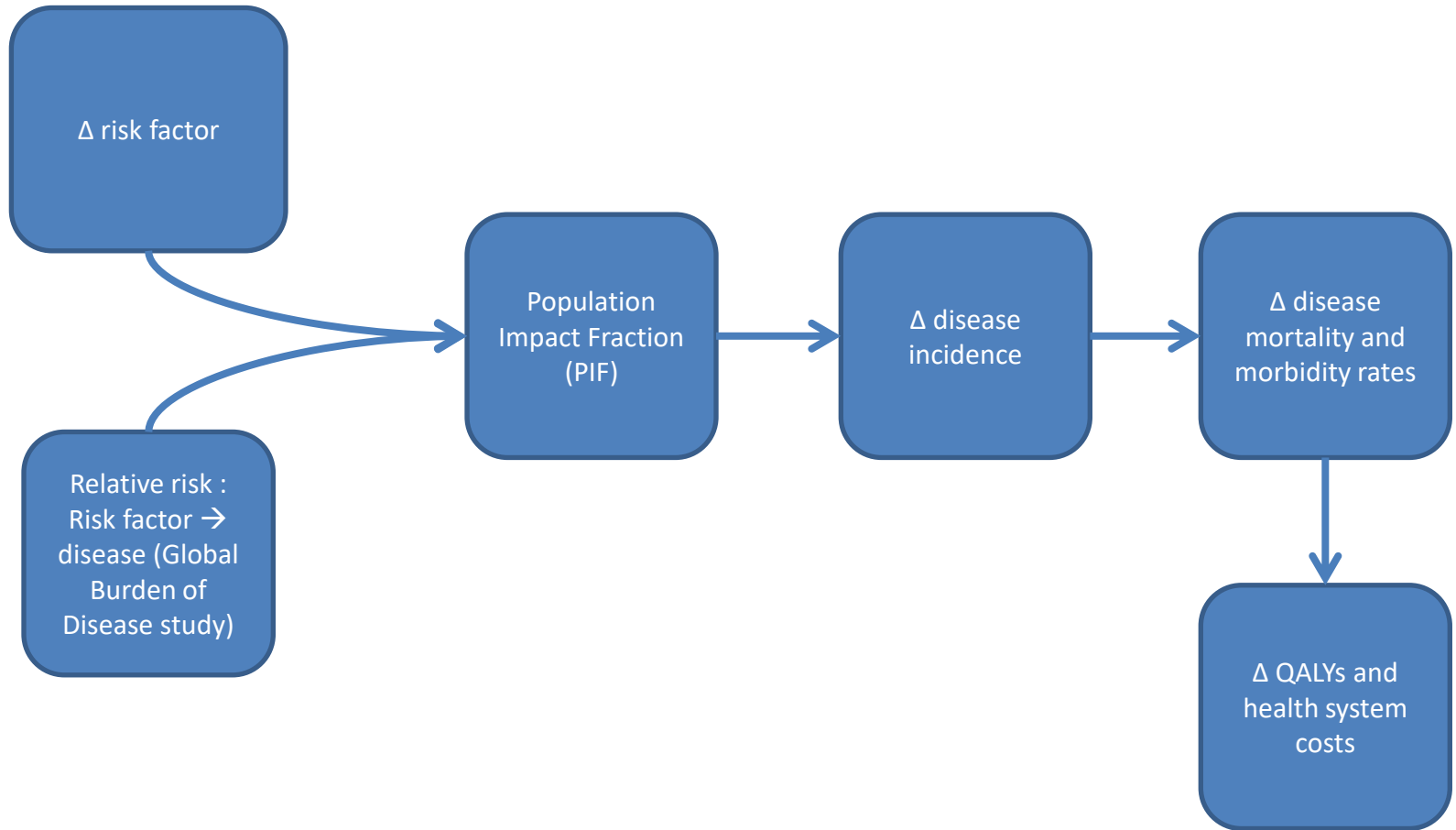
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┌──────────┐      ┌──────────┐         PRICE              ┌─────────────┐
│          │      │          │      ELASTICITIES          │ Δ purchasing/│
│   Tax    │ ───► │ Δ price  │ ──────────────────────────►│ consumption  │
│          │      │          │                            │             │
└──────────┘      └──────────┘                            └─────────────┘
                                                                 │
                                                                 ▼
                                                          ┌─────────────┐
                                                          │  Change in  │
                                                          │ dietary risk│
                                                          │   factors   │
                                                          └─────────────┘
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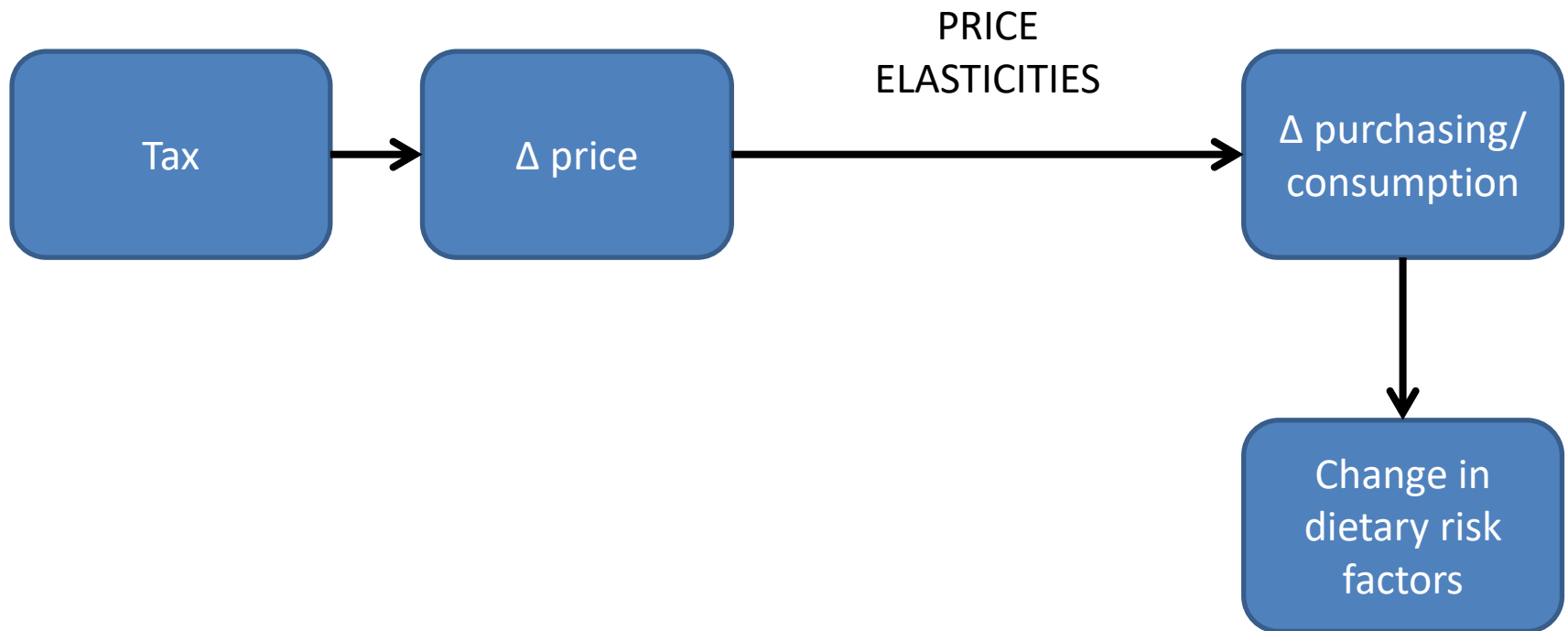
Methods: Intervention modelling

INTERVENTION MODEL

Taxes:
*Sugar tax ($0.72/100g sugar)
*Sugary drinks tax:
1. Sugar sweetened soft drinks and energy drinks.
2. Sugar sweetened soft drinks, energy drinks, fruit drinks and sports drinks

Subsidies:
*20% Fruit and vegetable subsidy

RISK FACTORS

Δfruit and veg intake g/day

ΔSodium intake

ΔPUFA intake

Δenergy intake

Δsugary drinks ml/day

ΔBMI

Methods: Multi-state life-table modelling


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Δ risk factor ─┐
               ├──→ Population Impact Fraction (PIF) ──→ Δ disease incidence ──→ Δ disease mortality and morbidity rates ──→ Δ QALYs and health system costs
Relative risk :
Risk factor → disease (Global Burden of Disease study) ─┘
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Methods: Multi-state life-table modelling

	BMI	Fruit	Vege-tables	Sugary drinks	Sodium	PUFA (%TE)
CHD	√	√	√		√	√
Stroke	√	√	√		√	
Type 2 diabetes	√			√		
Osteoarthritis	√					
13 cancers	n=10	n=3		n=1	n=1	

Multi-state life-table modelling

- Models from base year (2011) over the lifetime of the NZ population

- Takes a health system perspective

- No discounting

- Outputs:
  - Estimates QALYs gained
  - Estimates net health system cost savings
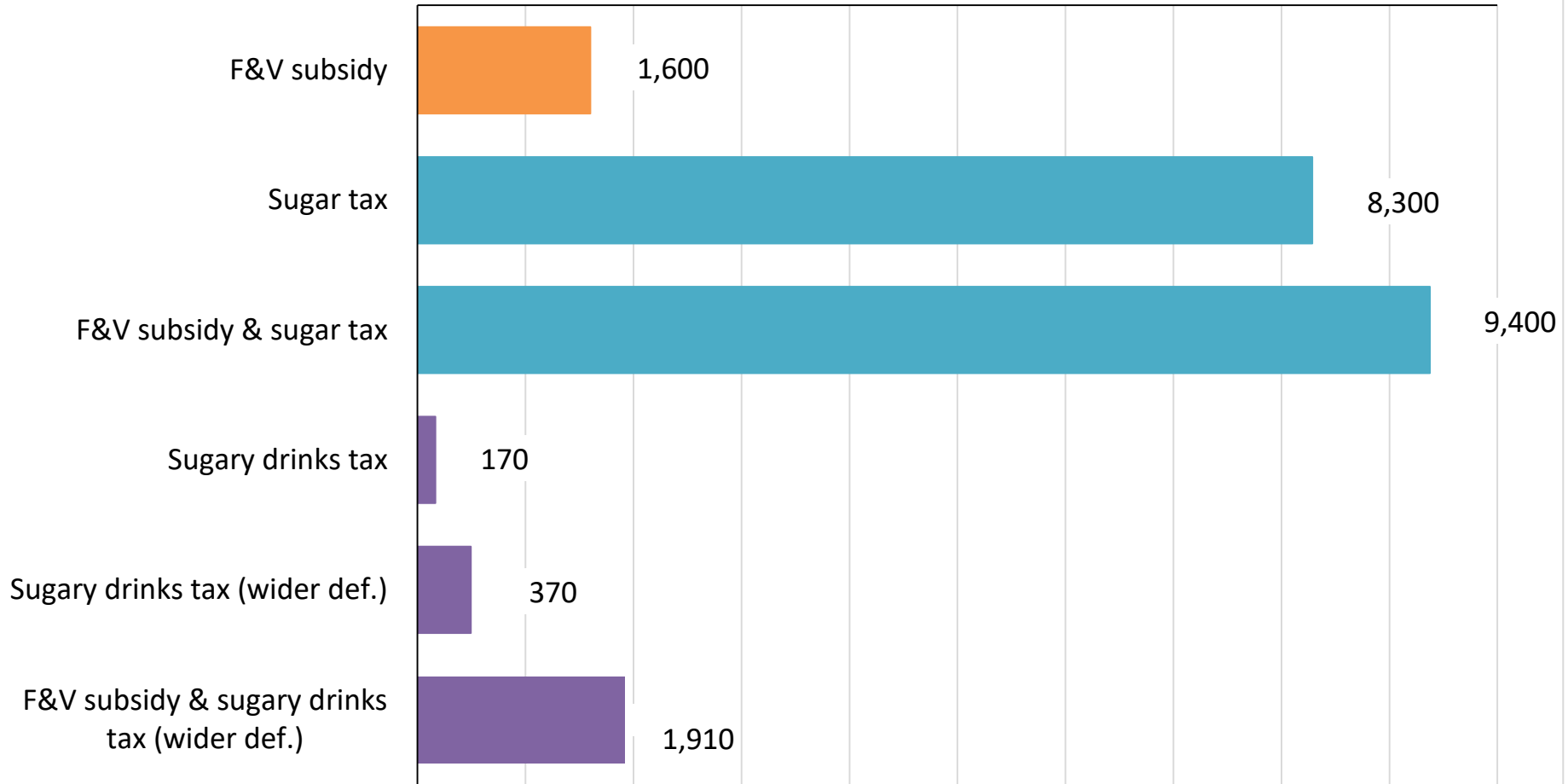 - Age standardised QALY gains for Māori and Non-Māori

Results

Health gains per 1000 population
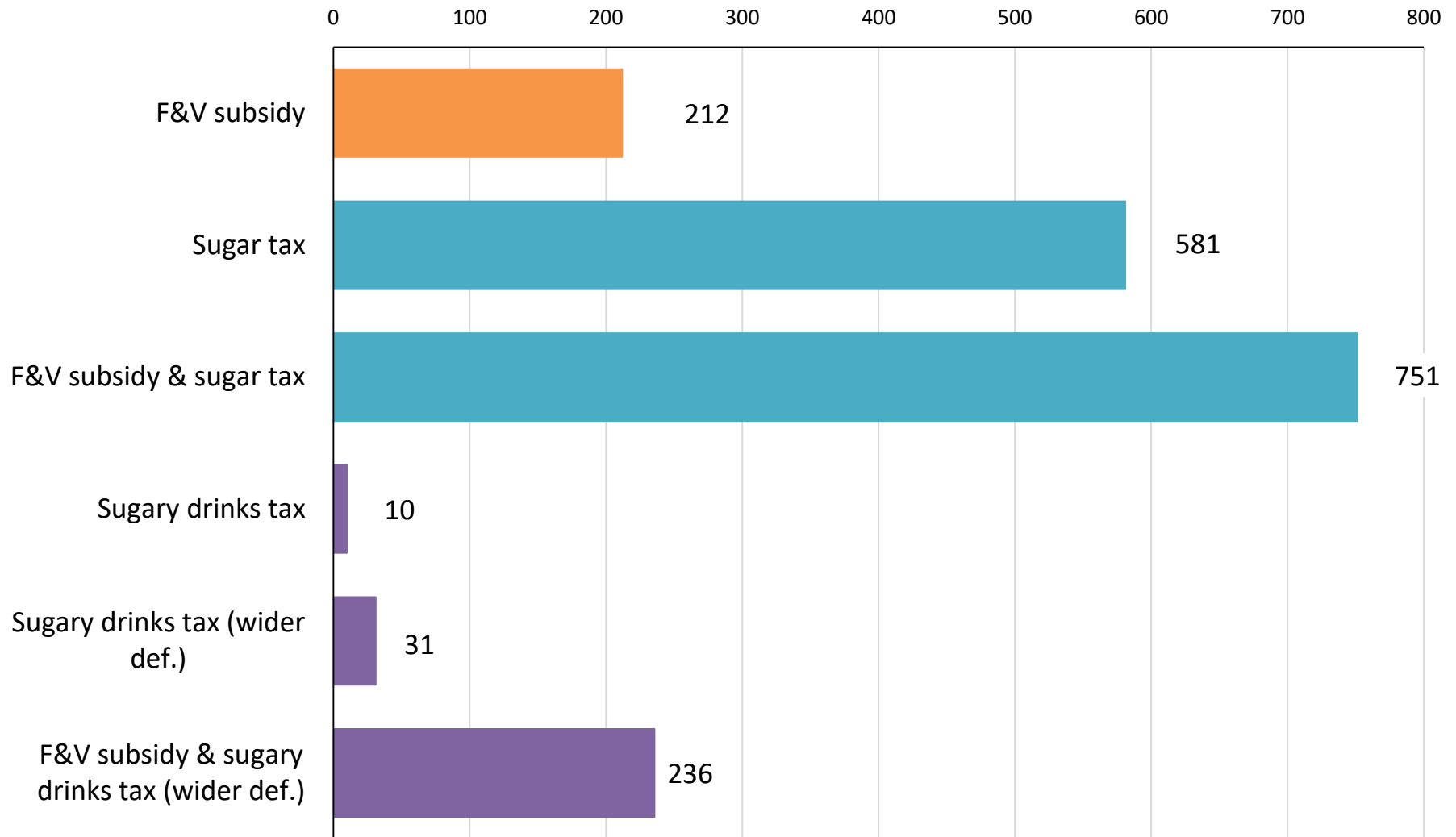
Sugary drinks tax: Sugar sweetened soft drinks and energy drinks. Wider definition: Sugar sweetened soft drinks, energy drinks, fruit drinks and sports drinks

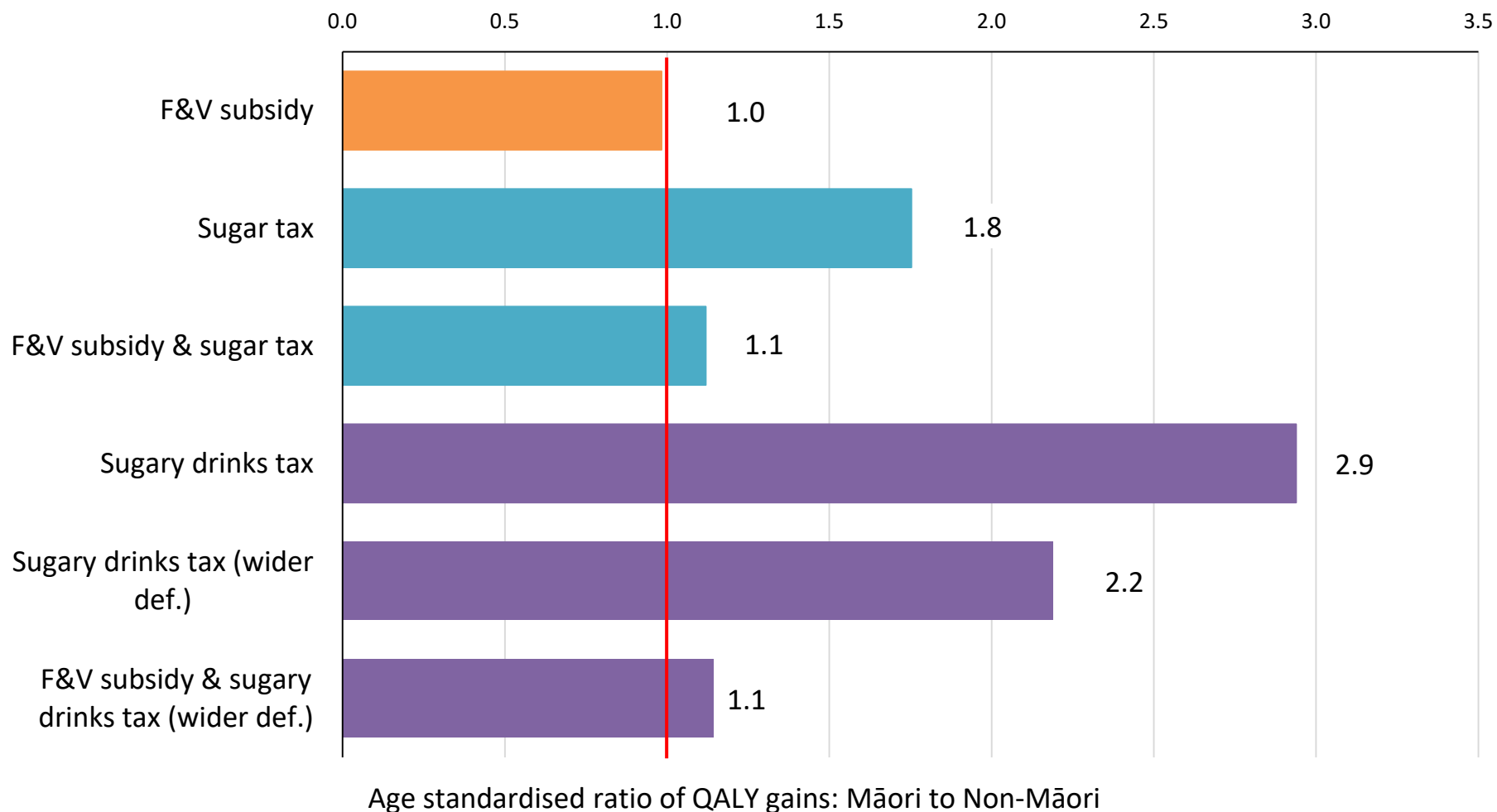# Health expenditure savings per capita

Health expenditure savings per person over lifetime of cohort (0% discounting)

Sugary drinks tax: Sugar sweetened soft drinks and energy drinks. Wider definition: Sugar sweetened soft drinks, energy drinks, fruit drinks and sports drinks

Ratio of health gains between Māori and Non-Māori

Age standardised ratio of QALY gains: Māori to Non-Māori

Category	Value
F&V subsidy	1.0
Sugar tax	1.8
F&V subsidy & sugar tax	1.1
Sugary drinks tax	2.9
Sugary drinks tax (wider def.)	2.2
F&V subsidy & sugary drinks tax (wider def.)	1.1

Sugary drinks tax: Sugar sweetened soft drinks and energy drinks. Wider definition: Sugar sweetened soft drinks, energy drinks, fruit drinks and sports drinks

Results

	QALYs	Cost savings (billions)	Age-standardised ratio of QALY gains: Māori to Non-Māori
FV subsidy	935,000	$ 7.1	1.0
Sugar tax	2,560,000	$ 36.5	1.8
FV subsidy & sugar tax	3,310,000	$ 41.3	1.1
Sugary drinks tax	43,600	$ 0.7	2.9
Sugary drinks tax (wider def.)	137,000	$ 2.2	2.2
FV subsidy & Sugary drinks tax (wider def.)	1,040,000	$ 8.4	1.1

Conclusions

- A sugar tax would generate large health gains and cost savings to the health system if implemented in NZ

- A much more politically feasible sugary drink tax will generate modest health gains and cost savings to the health system

    →Tax a wide array of sugary drinks to maximise gains

- Sugar and especially sugary drinks taxes have the potential to reduce ethnic health inequities if implemented well