

Changing food prices: effects on food and nutrient purchases and QALYs

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National
Science
Challenges

HEALTHIER
LIVES

He Oranga
Heora

bode³

DIET 
Dietary Interventions:
Evidence & Translation

 **THE UNIVERSITY OF
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Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

INFORMAS
BENCHMARKING FOOD ENVIRONMENTS

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NEW ZEALAND

Structure

- Effect of food taxes and subsidies in a virtual supermarket on food purchasing and nutrients
 - Like an RCT analysis, or direct analysis
 - Using price elasticities
- Effect of food taxes and subsidies in a virtual supermarket on quality adjusted life years
 - Using price elasticities into BODE³ simulation model
 - *Preliminary results; work in progress*

Type of Tax / subsidy	Scenarios within Type †	Low and high tax or subsidy	Included foods/drinks	completed shops (n; n/n for low/high)
1. Beverage tax	a. SSB: Sweetened sugary beverage tax	20% and 40% options	Sugar-sweetened carbonated soft drinks (n=16 products)	302 (152/150)
	b. SSB+: SSB + sugar-sweetened (SS) fruit drinks, SS energy drinks, SS sports drinks tax	20% and 40% options	Above, plus: Cordials and fruit drinks, Sports drinks, Energy drinks, Powdered drinks (n=25 products)	328 (167/161)
	c. SSB++: SSB + SS fruit drinks, fruit juices, SS energy drinks, SS sports drinks tax	20% and 40% options	Above, plus: Fruit Juices includes apple, orange, grapefruit, grape etc. (n=43 products)	308 (158/150)
	d. Fizzy drink tax	20% and 40% options	Sugar-sweetened carbonated soft drinks; Sugar free carbonated soft drinks; Fizzy energy drinks (n=33 products)	331 (178/153)
	Total drinks taxes (as included in analysis)			1269 (655/614)

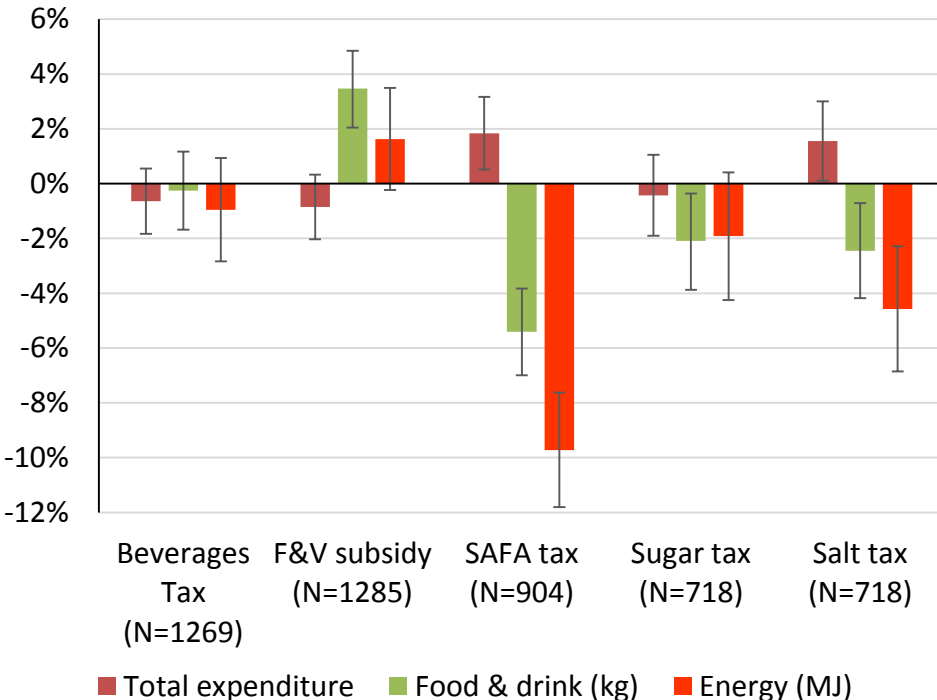
Type of Tax / subsidy	Scenarios within Type †	Low and high tax or subsidy	Included foods/drinks	completed shops (n; n/n for low/high)
2. F&V subsidy	a. Fresh FV only	20% (only)	Fresh fruit; Fresh vegetables (excluding potato products)	660
	b. Fresh FV + frozen	20% (only)	Above, plus: Frozen vegetables (plain); Frozen fruit (plain)	625
	Total F&V subsidy			1285
3. Saturated fat tax	Saturated fat tax	\$2/100g ^a or \$4/100g ‡	All processed (non-fresh) foods; excluding olive and avocado oil	904 (447/457)
4. Sugar tax	Sugar tax	\$0.4/100g or \$0.8/100g ‡	All processed (non-fresh) foods containing sugar	718 (379/339)
5. Salt tax	Salt tax	\$0.02/100mg or \$0.04/100mg sodium	All processed (non-fresh) foods containing salt	718 (350/368)
Control shops (no taxes, no subsidies)				645
Total shops assigned to just one tax or subsidy option				2545
Total shops assigned to two or more tax and/or subsidy				1068
Total shops				4258

Methods: like an RCT analysis

- Regression model, with dummy variables for each type of tax/subsidy

Impact on \$ spent, kg brought, energy

Percentage changes in total expenditure, kg purchased, and total energy

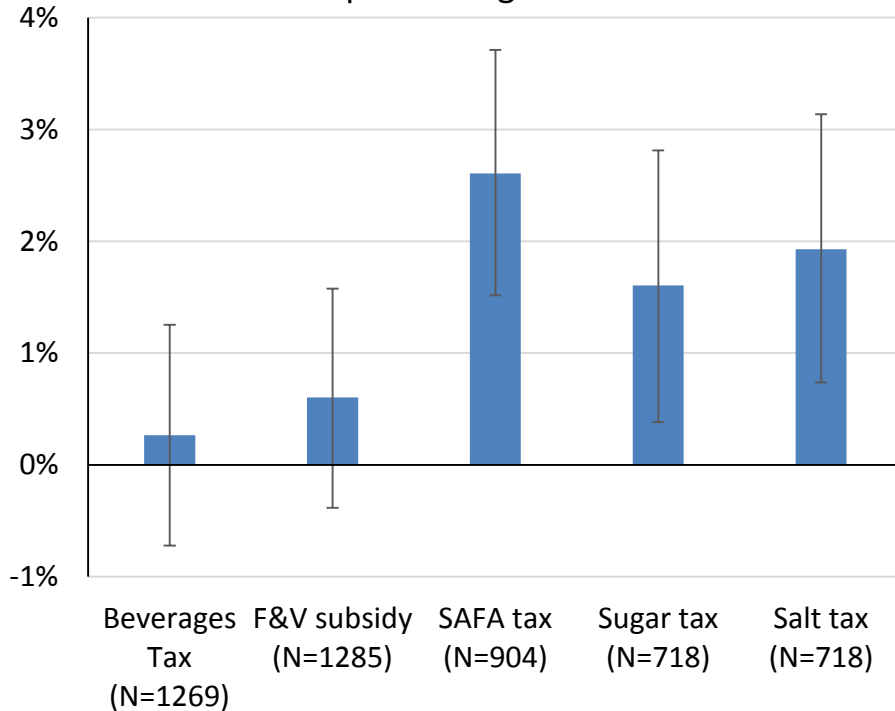


- Behaves pretty much as expected
- But note the (? implausible) reduction in energy intake for SAFA tax which we will return to later

Preliminary results – not for citation without permission of Tony Blakely

Impact on % of purchases 'healthy'

Percentage changes in healthy food purchasing

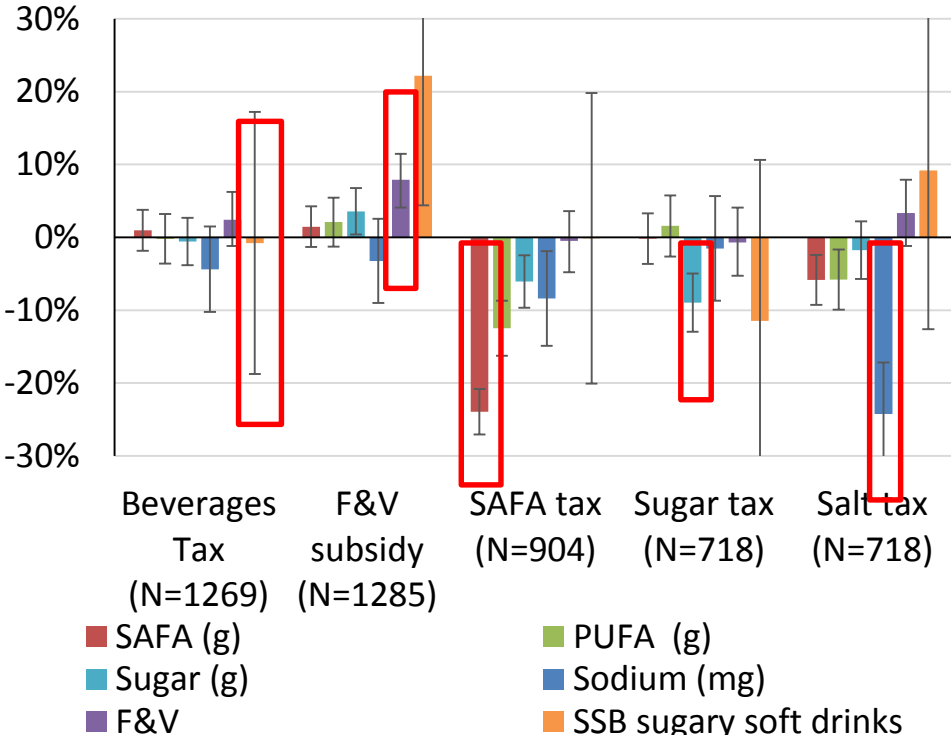


- Beverages and F&V:
Significant changes – but in expected direction
- SAFA, sugar and salt tax:
Each generates about 2% increase in healthy purchasing

Preliminary results – not for citation without permission of Tony Blakely

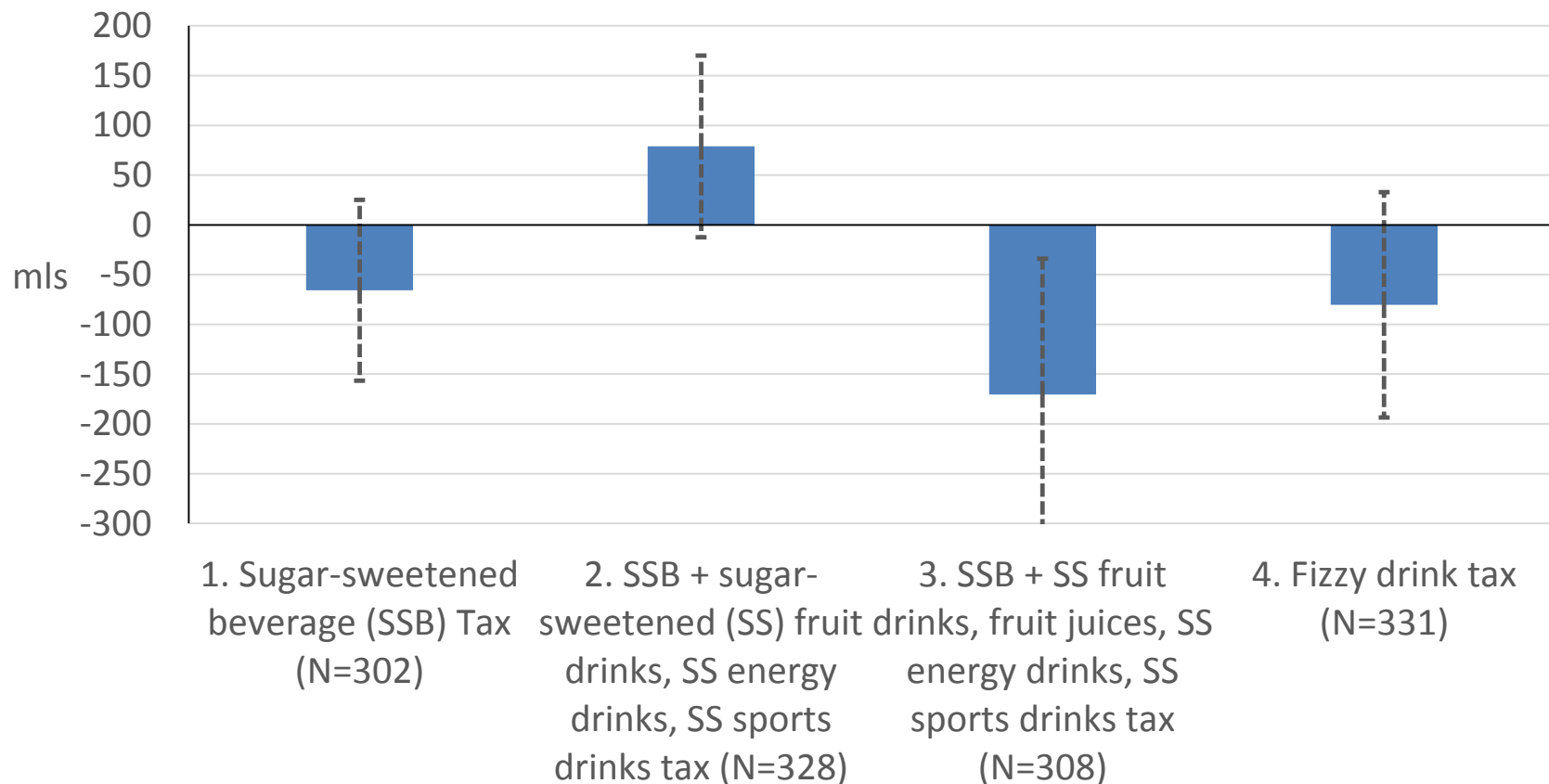
Impact on target nutrient / food

Percentage changes in SAFA, PUFA, sugar, sodium, F&V and SSBs



- Mostly as expected, and significant impacts, on target food.... except SSBs
- But SSBs actually 4 taxes assessed against combined SSB consumption, so lets look at that a bit more closely

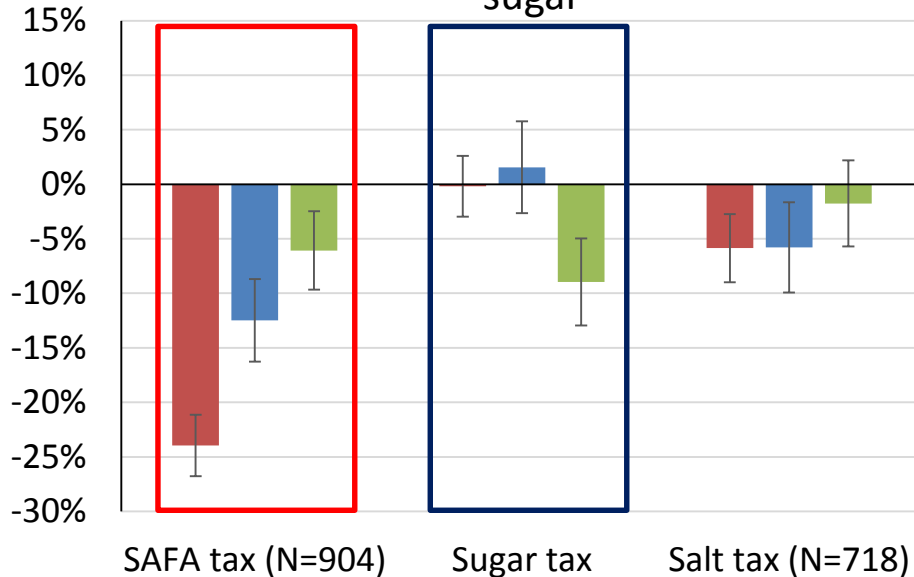
Change in mls of drinks targeted by each SSB tax



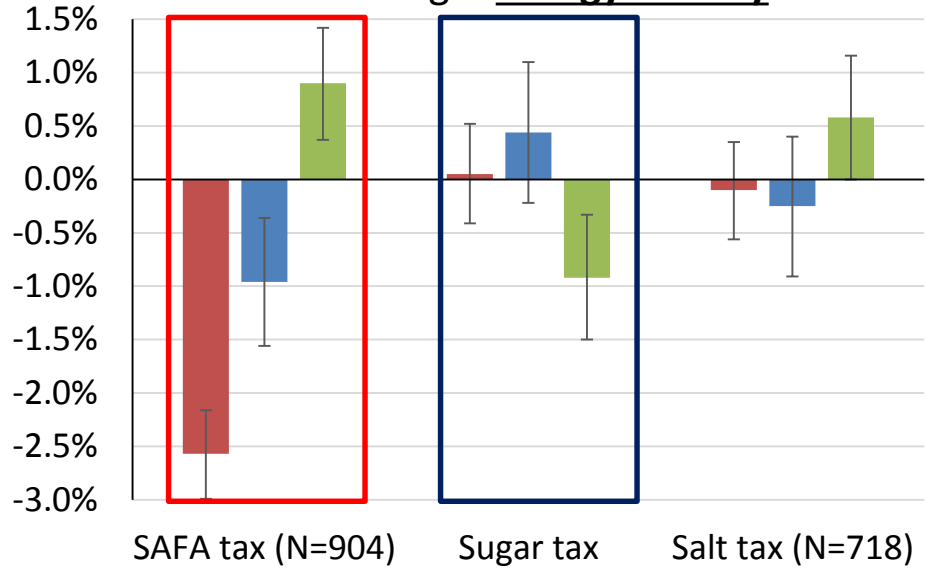
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Given perhaps implausible Δ in expenditure for SAFA tax, perhaps we should look at Δ in % energy impacts

Percentage changes in SAFA, PUFA and sugar



Percentage point change in SAFA, PUFA and sugar energy density

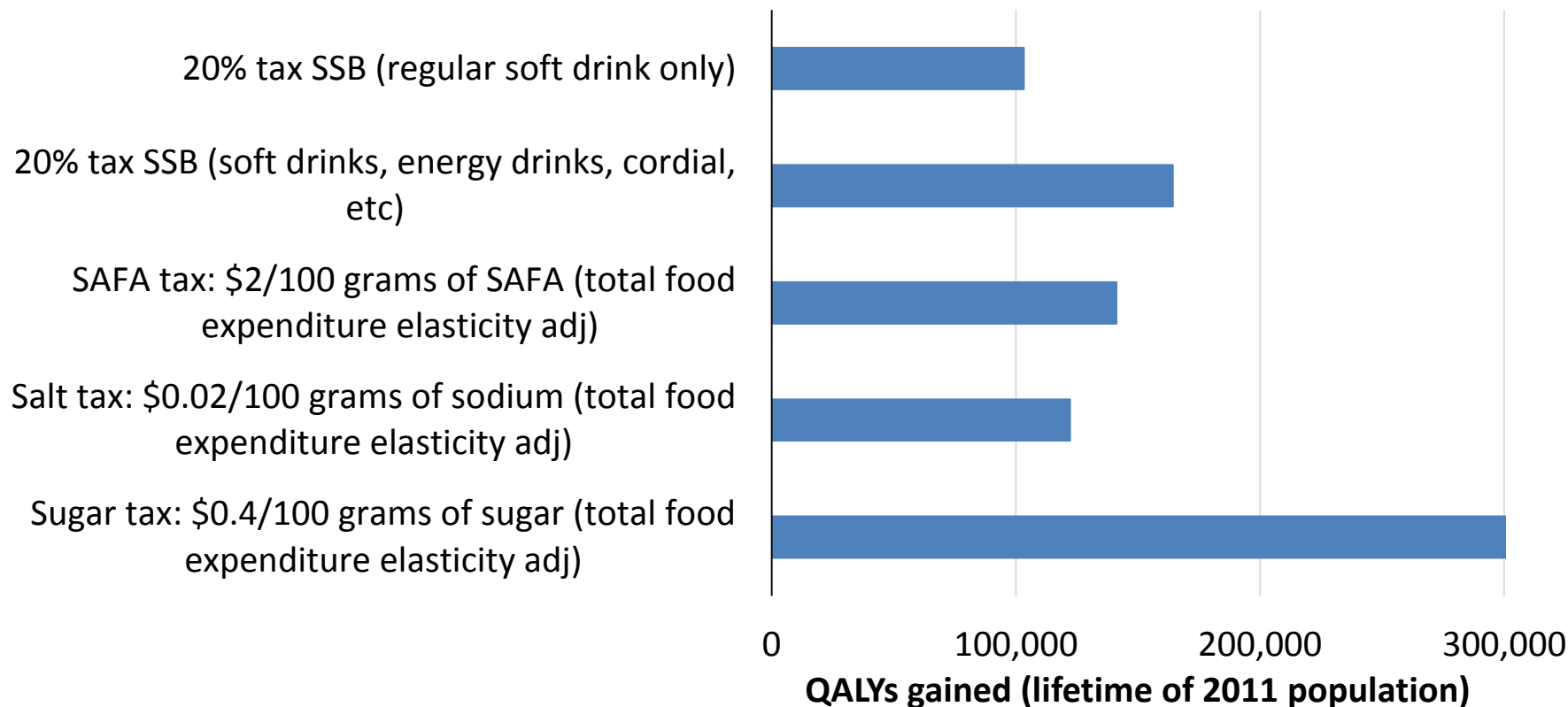


- Energy density results suggest SAFA tax pulls down SAFA (and PUFA), but displaces up sugar. [PE results adjusted for expenditure elasticity support energy density results.]
- Sugar tax in both analyses reduces sugar, no change SAFA, and possibly increase in PUFA

QALYs methods

- BODE³ simulation models
- Use 23 by 23 PE matrix
- *Preliminary results; work in progress; not for dissemination; etc*

QALYs over the remainder of the lives of the 2011 NZ population



**Preliminary results: not for dissemination.
Uncertainty about above estimates yet to be calculated, but likely sizeable**

Take home messages

- From multiple analytical perspectives, food taxes and subsidies in a New Zealand virtual supermarket suggest mostly healthy impacts
- Specifically:
 - SSB taxes usually supported
 - Sodium, salt and sugar taxes similar positive impacts
 - (F&V subsidy looks promising on to F&V, but net impact is work in progress)
- Strength: This is innovative world leading research
- Limitation: Quantitative estimating net health impact of food taxes and subsidies through modelling is challenging, and uncertain