Estimated impact of interventions to reduce salt consumption in NZ

Prof Nick Wilson, Dr Nhung Nghiem, Dr Cristina Cleghorn, Dr Linda Cobiac, Prof Tony Blakely

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Background

• “Diet high in sodium” 15th most important risk factor for health loss globally (GBD 2016 Study)

• Countries use a wide range of interventions:
  – Labelling (many)
  – Maximum levels in foods (eg, bread)
  – Media campaigns (eg, UK)
  – Taxing salty foods (eg, Hungary)
  – Encouraging industry to reformulate food
  – Substitution with KCl (eg, Finland)
  – Dietary counselling (many)
**Methods (sodium reduction)**

- Markov macro-simulation model (TreeAge)
- Estimates QALYs gained (↓CHD & ↓stroke)
- Methods details on BODE$^3$ website:
  - Nghiem et al 2016, *BMC Public Health*
  - Online Reports: eg, model validation
Results vary widely by interventions – QALYs gained (life-time) in NZ adults
Screenshot, online interactive league table: QALY gains (lifetime) for NZ population in 2011 (selection of 32 interventions)

QALYs gained for the NZ population alive in 2011
Screenshot, online interactive league table: health system costs (life-time) NZ$ for NZ population

- Salt substitution at 59%
- Salt tax
- Salt substitution at 25%
- Salt reduction of 25% in processed foods
- Tight limits on sodium in bread
- Moderate limits on sodium in bread
- Bread sodium reduction target achieved ‘M’
- Bread sodium reduction target achieved ‘V’

Net costs NZ$ (negative = cost saving)
Not yet in the online league table (but published): Cost-effectiveness planes
Cost-effectiveness plane: highest impact interventions
Who gains the QALYs & when

- Age-group (years) 35-44
- Age-group (years) 45-54
- Age-group (years) 55-64
- Age-group (years) 65-69
- Age-group (years) 70-74
- Age-group (years) 75-84
- Age-group (years) 85-94
- Age-group (years) 95+
Selected additional issues

• 33% higher per capita QALY gain for Māori
• Revenue from a salt tax – a potential plus?
• Particular value with salt substitution (industry already doing it)
• Priority foods for possible targeting eg,
  - bread
  - sauces
  - processed meats
Designing low-cost "heart healthy bread": optimization using linear programming and 15-country comparison

Nick Wilson*, Nhung Ngoiern, Sian Ryan, Christine Cleghorn, Nisha Nair and Tony Blakely

Abstract

**Background:** Bread is an important component of the diet, yet it also typically contributes too much of other nutrients. This study aims to determine the optimal design of low-cost "heart healthy bread" for 15 countries.

**Methods:** Optimization using linear programming was performed to determine the range of minimal sodium levels. Then with the constraints on dietary fiber and polyunsaturated fat content, the optimization was repeated for comparison nutrient and price data across 15 countries.

**Results:** The optimized loaf costing NZ$1.16 was able to meet or exceed three out of the eight heart health nutrient requirements in ingredients (HHRs) for 15 countries. The optimized loaf was nutritionally superior compared to the baseline loaf.
Limitations of this work

• Recent human & animal studies: Salt excretion is very metabolically demanding (so a lower salt diet might help with maintaining lower weight).

• Debate about J-shaped distribution persists – though probably an artefact of inaccurate measurement of sodium intake (see: He et al 2018, IJE).
Summary

- Policy-makers can consider NZ results for 32 methodologically comparable interventions in the BODE\(^3\) online interactive league table

- Sodium substitution – largest gains

- Some regulations seem very politically feasible eg, maximum levels on very salty sauces