

21 NOV 2017

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Dr Eric Crampton  
The New Zealand Initiative  
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Ref: H201703868

Dear Dr Crampton

### Response to your request for official information

Thank you for your request on 30 October 2017 under the Official Information Act 1982 (the Act) for:

- All advice provided by the Ministry of Health to Minister of Health Jonathan Coleman regarding sugar taxes;
- All briefings and correspondence related to Professor John Gibson's work on sugar taxes;
- All reviews and summaries of existing research about sugar taxes;
- Any meeting notes, PowerPoint slides, emails and correspondence regarding sugar taxes for any meeting of ELT. This should include all materials regarding sugar taxes from any ELT meeting that did include discussion of sugar taxes as well as all materials regarding sugar taxes from any proposed ELT meeting that would include discussion of sugar taxes.

We have decided to grant your request in part, namely information which has been made publicly available in response to previous Official Information Act requests. These items are listed below, with copies of documents attached. Where relevant under the Act, the grounds for withholding information are noted.

The Ministry has identified other information within scope of this request. However, it will take us some time to prepare this information and we may need to consult on its release. We will send you the information as soon as we are reasonably able.

Document	Date	Comments
Weekly report items related to sugar tax	Various dates	Excerpts from weekly reports pertaining to sugar tax under s16(e)
<b>Health Report 20150881</b> – Childhood Obesity – Preliminary advice on sugar taxes	2015	Withheld under s18(d) as the information is publicly available on the Ministry of Health website: <a href="http://www.health.govt.nz/system/files/documents/pages/hr20150881.pdf">http://www.health.govt.nz/system/files/documents/pages/hr20150881.pdf</a>
<b>Health Report 20151086</b> – Mexican Sugar Tax – Evidence	2015	Withheld under s18(d) as the information is publicly

<b>Health Report 20151086 – Mexican Sugar Tax – Evidence of Impact</b>	2015	Withheld under s18(d) as the information is publicly available on the Ministry of Health website: <a href="http://www.health.govt.nz/system/files/documents/pages/hr20151086.pdf">http://www.health.govt.nz/system/files/documents/pages/hr20151086.pdf</a>
<b>Memorandum 20160492 – International experience of sugar taxes</b>	4 April 2016	Released in full
<b>Internal Briefing for the Director-General – Meeting with Professor John Gibson – Sugar Tax Discussion</b>	8 June 2016	Released in full
<b>Health Report 20160905 – Meeting with Professor John Gibson – Sugar Tax Talking Points</b>	9 June 2016	Released in full
<b>Powerpoint slides of Dr Gibson’s presentation</b>	13 June 2016	Released in full
<b>Information to Minister of Health’s Office re sugar tax study</b>	10 November 2016	Released in full
<b>Memorandum 20161984 – Professor John Gibson’s public seminar on taxing unhealthy products, 1 December 2016</b>	29 November 2016	Released in full

Documents being withheld or released with redactions have been withheld or redacted under the following sections of the Act:

1. Section 18(d) that the information requested is publicly available. For your convenience, you can find these documents on the Ministry of Health’s website under the links provided in the table above.
2. Section 16(e) by giving an excerpt or summary of the contents.

You have the right, under section 28 of the Act, to ask the Ombudsman to review my decision to withhold information under this request.

Yours sincerely

  
**Stephen O'Keefe**  
**Chief Financial Officer**  
**Finance and Performance**

## Weekly Report – Excerpts relevant to sugar taxes

To Minister's office on 22 May 2015

### Childhood Obesity Plan

In the Minister's Letter of Expectation to DHBs, the Minister requested that DHBs consider how they will reduce the incidence of obesity.

In addition to getting ready for the food and beverage industry forum, officials are continuing to prepare A3s for the Minister's discussion with the Cabinet Strategy Committee on 15 June 2015.

Following the Ministry of Health's meeting with the Minister on 19 May 2015, the Ministry is developing reports for the Minister on targets and sugar tax. The Ministry will also provide the Minister with talking points for his meeting with Minister Parata to discuss actions to address improving food in schools.

#### *Healthy Families NZ workshops*

A key aspect of Healthy Families NZ is the development of an overarching national framework to support evidence-based action in settings to:

- act as an umbrella to link existing Ministry-funded settings-based health promotion programmes in NZ
- integrate key NZ-based tools, information and resources
- be a key source of data on the reach and impact of settings-based health promotion initiatives both nationally and in each of the 10 communities.

The Ministry has partnered with the Health Promotion Agency to do this work and co-host a series of workshops with key stakeholders at a national level (including Sport NZ, National Heart Foundation and Cognition Education), and within the ten community locations.

The workshops are an opportunity to bring together those who are working in different settings for an initial conversation about Healthy Families NZ and how we can work together to achieve sustainable change and increase population reach. Workshops have been held in Lower Hutt, Invercargill and Christchurch, and the rest will be held in the next four weeks. The Ministry will provide the Minister with feedback from these workshops after they have concluded.

To Minister's office on 15 June 2015

### Childhood Obesity Plan

In the Minister's Letter of Expectation to DHBs, the Minister requested that DHBs consider how they will reduce the incidence of obesity.

NB: Items 2 and 3 of this report also relate to childhood obesity.

Ministry officials had a short teleconference with the Childhood Obesity Technical Advisory Group on 11 June 2015 to update the advisory group on the progress of the childhood obesity plan. The membership of the advisory group will need to be adjusted once implementation planning progresses. To date, the advisory group has been weighted toward obtaining academic evidence.

In addition to the childhood obesity A3s and speaking notes for his discussion with the Cabinet Strategy Committee, Ministry officials have provided the Minister with advice regarding a sugar tax and working with industry.

## **Agencies for Nutrition Action (ANA) Conference - Childhood Obesity Input from Delegates**

At the Agencies for Nutrition Action (ANA) conference held in Auckland on 6 and 7 May 2015, the Ministry of Health invited delegates to respond to the question 'If you could do three things at a national level to address childhood obesity, what would they be?' Overall, delegates wanted clear, consistent messages on food and physical activity reflected in all settings that children are exposed to (schools, marketing, sponsorship, price, transport and health), along with skills training such as cooking.

The education setting received the greatest focus (85 of a total 218 responses). Popular education actions were: compulsory cooking in the curriculum, National Administration Guidelines for food, a compulsory national exercise programme, canteen guidelines, and expand Fruit in Schools.

Other ideas receiving five or more responses were: restrict marketing of unhealthy food/drinks to children and in sports settings, sugar sweetened beverages tax, remove GST from vegetables and fruit, national strategy/guidelines for food, health promotion campaign, and mandatory front of pack labelling.

Feedback from the conference has been used in considerations by Ministry officials in the development of policy advice on childhood obesity. A summary of the feedback will be included in the next ANA newsletter.

To Minister's office on 15 April 2016

## **Sugar Tax**

**Issue:** Public discussion of sugar tax is continuing in the media following the UK announcement of a tax to be levied on the manufacturers of sugar-sweetened beverages in two years. This action follows research showing a decline in consumption of sugar-sweetened beverages in Mexico following the introduction of a tax alongside a comprehensive range of other public health interventions. There has also been coverage of a Colmar Brunton survey showing about 2/3 respondents support the introduction of a sugar tax similar to that introduced in the UK and you have recently received a letter signed by 70 academics calling for some form of sugar tax. The Ministry has been advised that the NZ Initiative (a privately-funded think tank) will shortly publish a report *The Health of The State*, arguing against the imposition of a sugar or soda tax.

**Action:** The Ministry's position remains that there is no strong evidence that a sugar tax will significantly reduce obesity. The Ministry is keeping a watching brief on evidence and on changes in other jurisdictions and recently provided you with a summary of international experience and the evidence available to date.

The Ministry has invited Professor John Gibson (University of Waikato) to give a seminar on the latest evidence in this area and to meet with the ELT.

Advice will be provided to you about the potential to use the forthcoming World Health Assembly meeting to hold bilaterals to discuss tax policies in the context of a wider set of interventions addressing excessive consumption of sugar. The ELT and your office will also be provided with advice on any significant shifts in the international evidence of the potential efficacy of a sugar tax.

To Minister's office on 22 April 2016

## Sugar Tax

**Issue:** Public and media discussion of sugar tax continues.

Dr Eric Crampton (NZ Institute) was interviewed on Radio New Zealand and explained that, despite media reports, there is a lack of evidence for the effectiveness of sugar taxes and that significant questions have not been adequately explored, including how consumers substitute between brands, sizes and sources of energy intake (12 April 2016).

The Morgan Foundation published a blog post "Coleman vs Health Experts - Who is Right and Who is Wrong on the Sugar Tax?" (6 April 2016). This article was critical of the Ministry, and cites as robust two papers which in fact both acknowledge significant limitations in the evidence base.

Two relevant peer reviewed papers have been published:

- A modelling study estimating the impact of a 20 percent tax on sugar-sweetened beverages in Australia. It is based on old estimates of consumer behaviour and the results are very sensitive to small changes in the assumptions (Veerman et al, PLOS 2016)
- A modelling study estimating the impact of the fat tax on saturated fat consumption in Denmark (Smed et al, European Journal of Clinical Nutrition, 2016).

Further details about these papers can be provided.

**Action:** The holder of a major research grant to investigate the impact of the sugar tax in Mexico, Professor John Gibson of the University of Waikato, is amending his international travel schedule to come to Wellington on 13 June 2016, en route to Sydney. This is his earliest available date. Professor Gibson will give a seminar and meet with Ministry ELT members.

The Ministry will continue to keep an active 'watching brief' on international practice and evidence.

To Minister's office on 6 May 2016

## **Sugar Tax**

**Issue:** Media coverage of the issue has continued over the last week, including:

- a New Zealand First blog post supporting regulation and education rather than taxation
- a NZ Doctor magazine poll with 84 percent of respondents in favour of a tax
- continued media coverage of the New Zealand Initiative report *The Health of the State*
- in Australia, news reports suggesting that the Australian federal government is not currently considering introducing a tax (to be confirmed)
- in Thailand, reports that a tax may be introduced, similar to that in the UK (to be confirmed).

**Action:** Monitoring will continue. The holder of a major research grant to investigate the impact of the sugar tax in Mexico, Professor John Gibson of the University of Waikato, will visit Wellington on 13 June 2016.

To Minister's office on 13 May 2016

## **Sugar Tax**

**Issue:** The Ministry will provide a response to the Health Select Committee, addressing a petition to the committee from a group of South Auckland intermediate school students. The petition was based on work the students did in 2015, investigating the way people make food choices in their local community and the impact of sugar. The Ministry has responded to the Health Select Committee, acknowledging the excellent research and initiative shown by the students and outlining the Ministry's policies with respect to healthy food choices. The Ministry has also written to the school, congratulating the students on their work and offering to meet them.

The petition follows a trip to Wellington in November 2015 sponsored by the students' local MP, during which they met Labour MPs.

Media reports suggest the latest sales data from Mexico shows that per capita sales of sugar-sweetened beverages may have risen despite the tax.

A sugar tax proposal is being considered by the Thai cabinet with the objectives of better public health and increased state revenue. The proposal is to increase taxes on non-alcoholic drinks with high sugar content, with a two-level tax similar to the UK tax.

**Action:** Monitoring will continue. As previously reported, Professor John Gibson (Waikato University) will visit Wellington on 13 June 2016.

To Minister's office on 20 May 2016

## **Sugar Tax**

**Issue:** A key event this week is the announcement that Ireland will introduce a new health levy on sugar-sweetened beverages. Media reports suggest that it might be a tax that may also apply to other sugar-laden foods. The levy will be implemented alongside a new code of practice for marketing, measures to encourage industry to reformulate products, requirements on restaurants and hospitals to provide calorie information on meals, and more school sport.

**Action:** Monitoring will continue. Professor John Gibson (Waikato University) will visit Wellington on 13 June 2016.

To Minister's office on 19 August 2016

## **Sugar Tax**

**Situation** Canadian media reported that the Canadian federal government considered a tax on sugar-sweetened beverages (SSBs) before the 2016 budget. The media reports claim that Government analysis highlighted the mixed results of other countries' taxes on SSBs and the need for more time to elapse before the Mexican tax can be properly evaluated. A sugar tax was not included in the 2016 federal government budget. Instead, the government announced plans to introduce new labelling and public awareness campaigns. Monitoring of evidence and developments is continuing. We will be in contact with the Canadian government for more information.

To Minister's office on 21 October 2016

## **Sugar Tax**

**Situation** Last week the World Health Organization (WHO) released a report, *Fiscal Policies for Diet and Prevention of Noncommunicable Diseases*. The report, based on a meeting of global experts and evidence review in 2015, claims that there is increasingly clear evidence that taxes and subsidies influence purchasing behaviour when included in comprehensive multisectoral population-based interventions. The report acknowledges that there is an evidence gap with regards to the effect on weight and other diet-related risk factors. Taxes in the range of 20–50 percent are recommended to reduce consumption of sugar-sweetened beverages (SSBs). The report also urges governments to adopt subsidies on fruit and vegetables.

The Irish Minister of Finance has announced that the Republic of Ireland will implement a tax on SSBs in April 2018. It is expected to be designed to be consistent with and timed to coincide with the UK's implementation of a two-tiered levy on manufacturers and importers of SSBs.

Also last week, FIZZ, a New Zealand-based group of researchers and public health doctors who advocate for ending the sale of SSBs, held a symposium to support its call for SSB taxation.

**Action** This WHO report does not appear to use any new evidence about the effectiveness of sugar tax. We are exploring each of the references in more detail and will report back next week.

Professor John Gibson (University of Waikato) is expected to deliver a public seminar on his research related to SSB taxes in Wellington in November.

To Minister's office on 28 October 2016

## **Sugar Tax**

**Situation** Last week we reported that the World Health Organization (WHO) had released a report, *Fiscal Policies for Diet and Prevention of Noncommunicable Diseases*. The report claims that there is increasingly clear evidence in favour of taxation of sugar-sweetened beverages (SSBs). We have checked the report's references and have concluded that no new evidence is cited. The evidence base for the report relied mainly on early evidence of reduced consumption of SSBs in Mexico. Many of the references acknowledge the lack of evidence of any impact on obesity or obesity-related illness.

**Action** Monitoring of evidence is continuing. Professor John Gibson (University of Waikato) is expected to deliver a public seminar on his research related to SSB taxes in Wellington in early December.

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## Memorandum: International experience of sugar taxes

To: Hon Dr Jonathan Coleman, Minister of Health

### Purpose

This memorandum provides a high-level summary of the international experience of taxes on sugar or sugar-sweetened foods and beverages in response to a request from your office.

### Sugar taxes around the world

1. As shown in the attached table, the use of taxes on sugar and sugar-sweetened products around the world is varied. Taxes on sugar and sugar-sweetened products are applied in a range of different ways. There is no consistency in the type of tax, the tax rate or amount, the products that are taxed, the motivation for implementing the tax or the uses of revenue raised.
2. International experience with public-health-motivated taxes on sugar and sugar-sweetened products is very recent. There is no evidence that gains have been made in reducing obesity or obesity-related illness. It is also too early to determine whether any changes in consumption patterns might be sustained over time.
3. The strongest evidence for impacts of a sugar tax is based on Mexico's recent experience. There is some initial evidence that a tax on sugar-sweetened drinks may be passed through to consumers under certain market conditions, such as in a very concentrated market like Mexico's. Based on measurement of household consumption in Mexico, some consumers do appear to respond to an increase in the price of sugar-sweetened drinks, although the size and sustainability of the response is unclear. Furthermore, reports of sales data appear to contradict this finding.
4. The most recent published evidence on the sugar tax in Mexico<sup>1</sup> did not look at consumption outside of the home and was not able to determine whether consumers substituted larger volume containers for smaller volume containers. This substitution can reduce the impact of the tax by offsetting it against the lower price per ml that is typical for higher volume containers.
5. No study in any country has been able to control for the effect of health promotion efforts and increased availability of safe drinking water.
6. In most studies, reported reductions in energy or sugar intake are based on reported reductions in sugary beverage intake and do not take into account possible substitutions to other foods or alcoholic beverages.
7. No study has looked at the effect on consumers who do not change their consumption of sugar-sweetened beverages in response to the tax.

<sup>1</sup> Colchero, M.A., Popkin B., Rivera, J.A., Ng, S.W. (2016). Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. BMJ: 352.

Contacts:	Bronwyn Croxson, Chief Client Officer, Client Insights and Analytics	021 244 5690
	Sarah Hogan, Senior Policy Analyst, Office of the Chief Economist, Client Insights and Analytics	021 145 6159

Table 1 International experience with sugar tax

Country	Tax <sup>2</sup>	Year Implemented	Comments
Barbados	A 10% excise tax on locally produced and imported sugar-sweetened drinks.	2015	Revenue from the tax will be directed toward the health sector. Review planned for 2017.
Belgium	An extra excise duty on soft drinks of 0.03 Euros per litre (approx. NZ\$0.05) including sugar-sweetened and artificially sweetened varieties, as part of a general "health tax", added to a pre-existing excise duty, bringing the total duty to 0.068 Euros (approx. NZ\$0.11) per litre.	2016	
Chile	An ad valorem tax of 13% on sugar-sweetened drinks with sugar content over 6.25g of sugar per 100ml. And a lower rate of 10% on sugar-sweetened drinks with less than 6.25g of sugar per 100ml.	2014	The higher rate was increased from 13% to 18% in 2015.
Dominica	A 10% excise tax applied to food and drinks with high sugar content, including confectionery, soft drinks and other sugar-sweetened drinks.	2015	Revenues from the tax are intended to help fund a national "Get Healthy" campaign.
Denmark	A tax on soft drinks of 1.64 Danish Krone (approx. NZ\$0.36) per litre.	1930s	The tax was ineffective and unpopular. It was abolished in 2013 along with the 2011 fat tax.
Fiji	A 5% import excise duty on soft drinks and a domestic excise tax of 5c (approx. NZ\$0.03) per litre.	2006	The excise tax was replaced in 2007 with a 3% fiscal import duty on related raw materials. Casual monitoring of prices by Fiji Ministry of Health staff suggested that in 2006 prices increased by the amount of the tax.
Finland	A range of excise taxes on non-alcoholic beverages, confectionery, chocolate and ice cream. The excise tax on sugar-sweetened beverages is 0.22 Euros (approx. NZ\$0.36) per litre for beverages with more than 0.5% sugar and 0.11 (approx. NZ\$0.18) Euros per litre for all other non-alcoholic beverages.	Early 20 <sup>th</sup> century	Originally implemented for revenue-raising purposes. The confectionery tax was removed in 2000 and re-introduced in 2011. In 2017 the tax on confectionery and ice cream will be removed. (Smaller producers are exempt from the tax.)
France	Excise tax of 0.11 Euros per 1.5 litres (approx. NZ\$0.12 per litre) on sugar-sweetened drinks as well as artificially-sweetened drinks.	2012	Some evidence that sales of soft drinks may have declined.
French Polynesia	A tax on the production of many "unhealthy" foods and an import tax on sweetened drinks, beer and confectionery, and a separate tax on ice cream. Taxes amount to 40 CFP (approx. NZ\$0.56) per litre on locally produced goods and 60 CFP (approx. NZ\$0.84) per litre on imported goods.	2002	Revenues are used to fund preventive initiatives, some of which are related to health.
Hungary	A "public health tax" on a range of unhealthy products, based on sugar, salt and fat content, including sugar-sweetened as well as artificially-sweetened soft drinks (taxed at 10%), salty snacks and condiments.	2012	The intention was that the tax would help pay for state-funded health care, which had a deficit of approximately 371 million Euros (approx. NZ\$615 million).
Mauritius	An excise tax applied to sugar-sweetened drinks according to sugar content of MUR 0.2 (less than NZ\$0.01) per gram of sugar.	2012	Increased to MUR 0.3 (approx. NZ\$0.01) per gram of sugar in 2013.

<sup>2</sup> All foreign currency amounts were converted to a crude New Zealand dollar approximation using the market exchange rate on 04/04/2016.

Country	Tax	Year Implemented	Comments
Mexico	MXN1 (approx. NZ\$0.08) per litre tax on sugar sweetened drinks. Fruit juices and milk-based drinks are excluded. Implemented along with 5% tax on junk food, extensive health promotion initiatives and a major investment in safe drinking water infrastructure.	2013	Evidence is still emerging. Household survey-type data suggest there may have been some decline in consumption but sales data contradicts this. No evidence of changes in BMI, obesity rates or health status.
Nauru	A sugar levy of 30% on only imported sugar, confectionery, carbonated soft drinks, cordials, flavoured milks and drink mixes.	2007	The levy was said to be implemented specifically to 'discourage excessive consumption of sugar' (Nauru Minister for Finance, 2007). A levy on bottled water was removed to offset the impact of the sugar levy on household budgets. The increase in retail prices has been less than 30% because of an upsurge in cheaper Asian products.
Norway	Excise tax on refined sugar products, including soft drinks set at 7.05 kroner (approx. NZ\$1.23) per kilogram of sugar.	2008	
Samoa	A soft drink excise tax was set at 20% in 1984: changed to a fixed rate of 0.30 Tala (approx. NZ\$0.17) per litre; and increased to 0.40 T/l (approx. NZ\$0.23) in 2008.	1984	The recent increases have been to raise revenue. Prior to this increase, the Ministry of Health had raised awareness of the importance of healthy eating. Survey data suggest that the number of servings of soda consumed by Samoan men and women may have decreased slightly between 1991 and 2003, from around 2.5 to just over 2 servings per week.
South Africa	A tax on sugar-sweetened drinks was proposed in 2016. Details are yet to be announced.	2017 (planned)	
St Helena	An excise duty of £0.75 (approx. NZ\$1.56) per litre on sugar-sweetened beverages with at least 1.5g of sugar per litre.	2014	
Tonga	A tax of 1 Tonga Pa'anga (approx. NZ\$0.66) per litre on soft drinks containing sugar or other sweeteners, including artificial sweeteners.	2013	
United Kingdom	A tax on sugar-sweetened drinks was proposed in the 2016 budget, to be implemented in 2018. Manufacturers of sugar-sweetened drinks will be taxed according to the volume of sugar in drinks they produce or import, with two levels of tax, one for drinks with over 8g per 100ml (likely to be 18p or approx. NZ\$0.37 per litre) and one for drinks with 5-8g per 100ml (likely to be 24p or approx. NZ\$0.50 per litre).	2018 (planned)	The two-year delay before the tax is implemented is intended to give industry time to reformulate products. Revenue is expected to be spent on funding sport in primary schools
United States	No federal tax. Various taxes at the city and state level. Most notably the city of Berkeley, California, which taxes sugar-sweetened beverages at USD 0.01 (approx. NZ\$0.01) per fluid ounce. Milk products are exempt.	2014	Outcome objectives and spending of revenues raised varies by municipality and state.

END.

# Internal Briefing for the Director-General

**To:** Chai Chuah, Director-General of Health      **For your:** Information  
**Date:** June 9, 2016      **Timing:** Routine  
**From:** Bronwyn Croxson, Acting Chief Client Officer, Client Insights and Analytics      **Security:** Unclassified

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## Meeting with Professor John Gibson – Sugar Tax Discussion

### 1. Background

This briefing provides you with information for a meeting with Professor John Gibson of the University of Waikato, on June 13:

- The meeting has been scheduled due to the increased interest by the media and general public in sugar tax and calls for such a tax by New Zealand health academics.
- The Ministry has been keeping a watching brief on emerging evidence from around the world.
- The Ministry has thus far responded to sugar tax enquiries by stating that there is currently insufficient evidence and pointing out that Professor Gibson's research is underway and is likely to provide important insight.

Dr Gibson's schedule for the day is as follows:

8:45am      Dr Gibson's flight due to arrive in Wellington  
9:30 – 10:15am      Meeting with you in your office (With Bronwyn Croxson and Sarah Hogan, Ministry lead on this issue, other ELT members have been invited.)  
10:30 – 11:00am      Meeting with Minister Coleman in his office (with you)  
11:30 – 12:30am      Dr Gibson's presentation to Ministry staff

### 2. Advice

In addition to the suggested discussion points included in the attached briefing note for Minister Coleman, you might want to discuss these issues with Professor Gibson:

1. Is there any evidence that increased public awareness resulting from the sugar tax debate and media attention are responsible for changes in consumption?
2. What should governments consider in deciding what to do with any revenue raised by this kind of tax?
3. Has Dr Gibson's research revealed any other evidence that may be relevant to the objective of reducing childhood obesity?

#### Ministry lead

Sarah Hogan  
Senior Policy Analyst Economics  
Office of the Chief Economist  
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816 2852  
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Chai Chuah  
Director-General of  
Health

Security classification: In-Confidence

File number: AD62-14-2016

Action required by: N/A

## Meeting with Professor John Gibson – Sugar Tax Talking Points

To: Hon Dr Jonathan Coleman, Minister of Health

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### Purpose

This briefing provides you with information for a meeting with Professor John Gibson of the University of Waikato, on June 13, at 10:30am in your office. Dr Gibson is leading important research on sugar taxes.

### Background

1. The meeting has been scheduled due to the increased interest by media and the general public in sugar tax and calls for such a tax by New Zealand health academics.
2. The Government position has been that there is currently insufficient evidence that a sugar tax will have any impact on obesity or obesity-related illness. Responses to enquiries about sugar tax have also pointed out that Professor Gibson's research is underway and is likely to provide important insight.
3. The Ministry of Health has been maintaining a watching brief on emerging evidence and experience with sugar tax around the world.
4. Some early evidence has emerged from Mexico and this has been seen as significant by some parties. However there are many unanswered questions.
5. Dr John Gibson is a professor of economics at the University of Waikato. He is currently leading a team researching the Mexican, Vietnamese and Indonesian experiences with sugar and tobacco taxes. The research is being funded by a 2014 grant from the Marsden Fund.
6. The research is expected to be a world first in that the analysis of consumer response to a tax will consider that consumers have the option of purchasing the same product at different quality and price levels. Substituting to lower-prices, lower quality goods can allow consumers to offset the tax while maintaining, or even increasing, the amount of sugar consumed without increasing expenditure. Previous research which has not considered this response is likely to have overestimated the fall in consumption due to such taxes and overstated the effectiveness of the tax.

Contacts:	Bronwyn Croxson, Acting Chief Client Officer, Client Insights and Analytics	021 244 5690
	Sarah Hogan, Senior Policy Analyst Economics, Office of the Chief Economist, Client Insights and Analytics	816 2852

## Talking points

7. What is Dr Gibson's assessment of the current state of evidence on sugar taxes?
8. What are the ideal conditions for a sugar tax, and what impact can be expected under these conditions?
9. How can the right level or rate of a tax be determined?
10. What other issues should be considered in designing a tax? Eg. What products should be taxed? Are two-tiered taxes, such as the one planned for the UK, likely to be more effective?
11. What factors reduce the effectiveness of sugar taxes, and how relevant are these in the New Zealand context?

END.

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## Powerpoint slides of Dr Gibson's presentation to the Ministry of Health

Ministry of Health  
Wellington  
June 13, 2016

### Uncontrolled Quality Responses Bias Price Elasticities of Demand Estimated From Household Surveys (and give grounds for caution on fat and sugar-sweetened beverage taxes)

John Gibson, University of Waikato

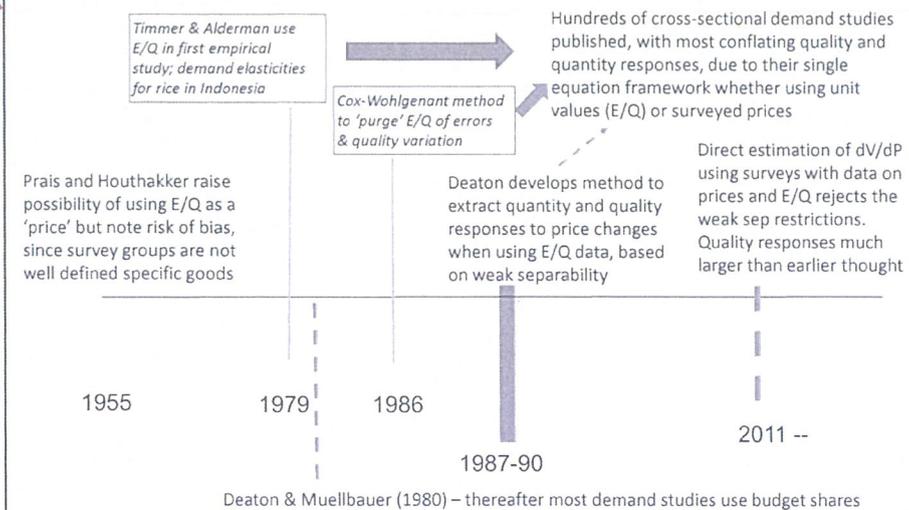
#### Introduction

- Taxes on unhealthy items like sugar-sweetened beverages (SSBs) are increasingly advocated
  - Recently imposed in Mexico, France, UK, Romania, Barbados and 30 US states and some individual cities
- New Zealand Medical Association (2014)
  - "taxation on unhealthy foods is the single most cost-effective approach to tackling obesity"
- Several economic-epidemiological studies appear to support this development
  - Household-survey based demand estimates to get disaggregated price elasticities are at the heart of these studies

## elasticity estimates from HH survey data have a big (and largely ignored) problem

- Most demand modelling on household survey data uses budget share data
  - Budget shares reflect both quantity and quality
- to derive quantity responses from observed budget shares as prices change, we need to model quality choice, to allow for quality downgrading in response to the price change
- Most studies in the literature ignore this and implicitly assume that there is zero scope for quality response
  - in countries studied thus far, much of the response to price changes is quality adjustment rather than quantity response
  - ➔ Efficacy of taxing unhealthy items will be greatly overstated

## Timeline for understanding demand elasticities from household surveys



## The Prais-Houthakker Insight

- Household surveys do not provide data on the expenditures on, and quantity consumed of, specific goods -- contrary to the textbook demand model

"An item of expenditure in a family-budget schedule is to be regarded as the sum of a number of varieties of the commodity each of different quality and sold at a different price." (P&H, 1955, p.110)

- Since there are many different varieties, brands, package sizes etc within a commodity group the consumer faces two choices:
  - What quantity to buy and consume
  - What quality (as shown by the price per unit) to buy and consume
- Demand estimates that do not allow for both of these choices will conflate quality responses to price changes with quantity responses
  - Overstating efficacy of price rises in reducing quantity consumed (and hence, reducing intake of fats, sugar, calories etc)

## Heterogeneous Groups are not the Issue

Even narrowly defined food groups will have within-group quality variation

Discussed by Deaton (1988: 420)

'The unit value of "meat" is clearly not a price. Meat is not a homogeneous commodity, but a collection of commodities, in this case agouti (a large rat), palm squirrel, venison, other game animals, game birds, chicken, guinea fowl, beef, pork, mutton, goat, and canned meat'

'Even for a more narrowly defined commodity such as beef, there are more and less expensive cuts, and there are lean, scrawny (and cheap) agoutis as well as fat, sleek, and tasty ones'

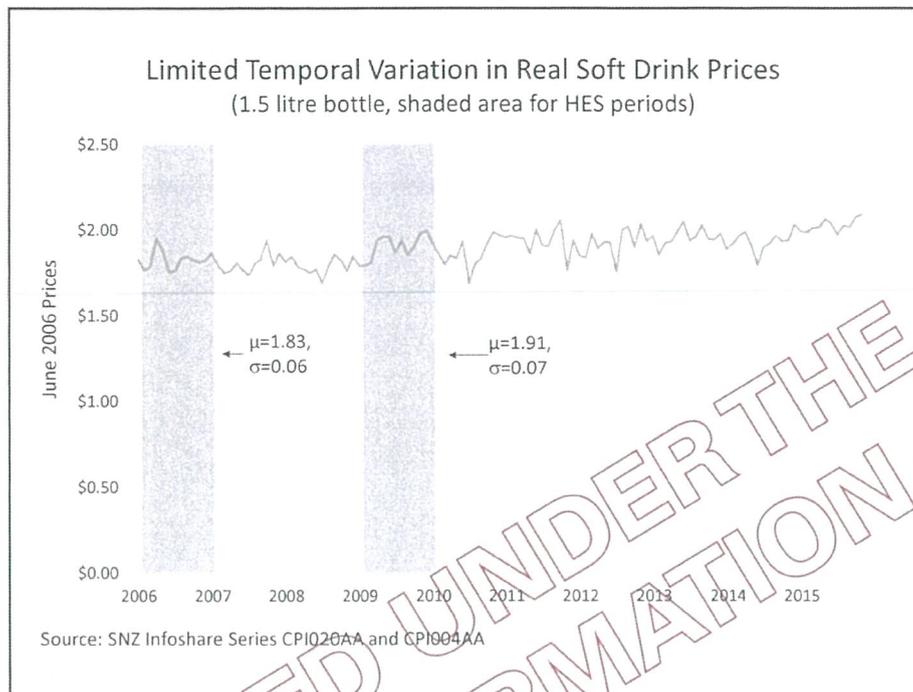


## A Less Exotic Example

- Much recent publicity in NZ about advocacy for a SSB tax and claims about predicted effects on health
- Carbonated soft drinks are one of the 24 food and beverage groups used in the PLoS study by researchers at WSM, NZIER and Otago economics
  - Yet there is a big quality variation within this seemingly narrow group that is not controlled for in their analyses
  - This oversight is typical of the literature
  - We can only extrapolate from poorer countries to examine the likely bias, but both quality and demand for variety are income elastic, so ignoring quality likely to be even bigger sources of bias in rich countries than in poor countries

## The easiest, and probably largest, response is not controlled for

- sugar-sweetened beverages (SSBs) have limited price variation over time and space
  - Within-year variation during Household Economic Survey (HES) periods of  $\sigma=0.06$  to  $0.07$  (20 cents up and down would cover 99.7% of the price range)
  - Between HES periods (3 years apart) average real prices changed by about 4%
  - Across regions and within year  $\sigma=0.12$  so 36 cents up or down would cover 99.7% of range; high/low ratio of  $\approx 1.4:1$
- But huge price variation within group (and within the same store) of  $\approx 8:1$  magnitude is not controlled for



## Within-group variation

- Inside any store in NZ a far wider range of prices within the fizzy drink group than over time or between regions  
→ offering great scope for quality substitution
- e.g New World Hillcrest (Hamilton) last Friday
- Highest price: \$5.83 per litre
  - (4 pack, Coke zero 330ml)
- Lowest price: \$0.77/ per litre
  - (1.5 litre Pams)
- Standard deviation of \$1.10 across the 40 varieties (in June 06 prices to compare with the estimate for FPI of  $\sigma=0.12$  at the time of the HES)
- almost 10x as much within group variability as between area + over time variability yet this is ignored in analyses



Huge within-group (quality) variation in prices, even within the same store



Formal structure: Budget Share ( $w_{Gi}$ ) and Unit Value ( $v_{Gi}$  to proxy quality) equations

$$w_{Gi} = \alpha_G^0 + \beta_G^0 \ln x_i + \sum_{H=1}^N \theta_{GH} \ln p_H + \gamma_G^0 z_i + u_{Gi}^0$$

$$\ln v_{Gi} = \alpha_G^1 + \beta_G^1 \ln x_i + \sum_{H=1}^N \psi_{GH} \ln p_H + \gamma_G^1 z_i + u_{Gi}^1$$

$i$  = household,  $G, H$  = goods

If wrongly ignore quality effects, only 1<sup>st</sup> equation is used, with

$$\text{price elasticity formula: } \varepsilon_{GH} = (\theta_{GH} / w_G) - \delta_{GH},$$

$$\delta_{GH} = 1 \text{ for own-price, } 0 \text{ otherwise}$$

This implicitly assumes that all adjustment is on the quantity margin and none is on the quality margin

Correct, unrestricted, quantity elasticity formula (2 equation system)

$$\partial \ln w_G / \partial \ln p_H = \theta_{GH} / w_G = \boxed{\varepsilon_{GH} + \psi_{GH}}$$

$$\varepsilon_{GH} = (\theta_{GH} / w_G) - \psi_{GH}.$$

combined effect of responses to price change on the quality and quantity margins is often wrongly interpreted as the elasticity of quantity w.r.t price

Need estimates of  $\psi_{GH}$  so as to isolate just the quantity response

Few estimates use correct 2-equation modelling of quantity and quality

- Most household surveys lack matched price surveys that are spatially and commodity-wise disaggregated
- Even if survey data are matched to an external price survey (e.g. for CPI) most analyses wrongly use a single-equation framework that ignores quality responses
  - Bias from the single equation framework is irrespective of whether prices are measured using price surveys or using unit values
- Published evidence for correct 2-equation models is just from Indonesia (McKelvey, 2011) and Vietnam (Gibson/Kim, 2013)
  - Own-price elasticity of demand for sugar is -0.4 in Indonesia if quality response is ignored but just -0.14 once accounted for
  - Price elasticity of demand for rice in Vietnam is -0.83 ignoring quality variation but just -0.27 once quality adjustment accounted for

## Deaton's Method

- Over 25 years ago Nobel Prize winner, Angus Deaton developed a way to purge quality responses to get price elasticity of quantity
  - Method was based on only having unit values (expenditures over quantities) from a household survey but not having prices
    - This is the usual situation in poor countries, while opposite holds in rich countries where price surveys are available but indicators of quality are not available from the household surveys
  - Deaton's method relies on quality response to price changes operating like an income effect

Deriving the  $dV/dP$  with missing prices under Deaton's quality separability assumptions (2 equation system)

$$\frac{\partial \ln v_{Gic}}{\partial \ln p_{Hc}} = \overset{\text{unobserved}}{\psi_{GH}} = \delta_{GH} + \beta_G^I \frac{\varepsilon_{GH}}{\varepsilon_G}$$

$\delta_{GH} = 1$  for own-price, 0 otherwise

$\beta_G^I$  income elasticity of quality

$\varepsilon_{GH}$  price elasticity of quantity demand

$\varepsilon_G$  income elasticity of quantity demand

## Four ways to estimate price elasticity of quantity demanded

		Assumption about Quality Substitution	
		Zero	Non-zero
Source of Data on prices	Unit Values	Standard Unit Value Method	Deaton Method (s.t. weak separability)
	Price survey	Standard Price Method	
	Both UVs and Prices		Unrestricted Method

## SSB tax literature ignores quality responses

- We examined 22 studies that are covered in the various systematic reviews on SSB taxes
  - Had to be household-survey based for us to consider them
  - 11 used standard UV method
  - 6 used standard price method
  - Only five attempted any control for quality substitution
    - Most did not even mention the issue

## New, very disaggregated, results

- Estimate food demand systems for Vietnam using budget shares, prices, and unit values for 45 food and beverage groups
  - Specially conducted surveys in 2010 and 2012 that gathered spatially- and commodity-wise disaggregated prices linked to household survey with moderately disaggregated food groups
- Test and reject restrictions of Deaton's method
  - The response of quality to price is quite different (and much larger) than implied by Deaton's weak separability restrictions
  - Unrestricted quantity elasticity w.r.t price just one-quarter what standard price method indicates

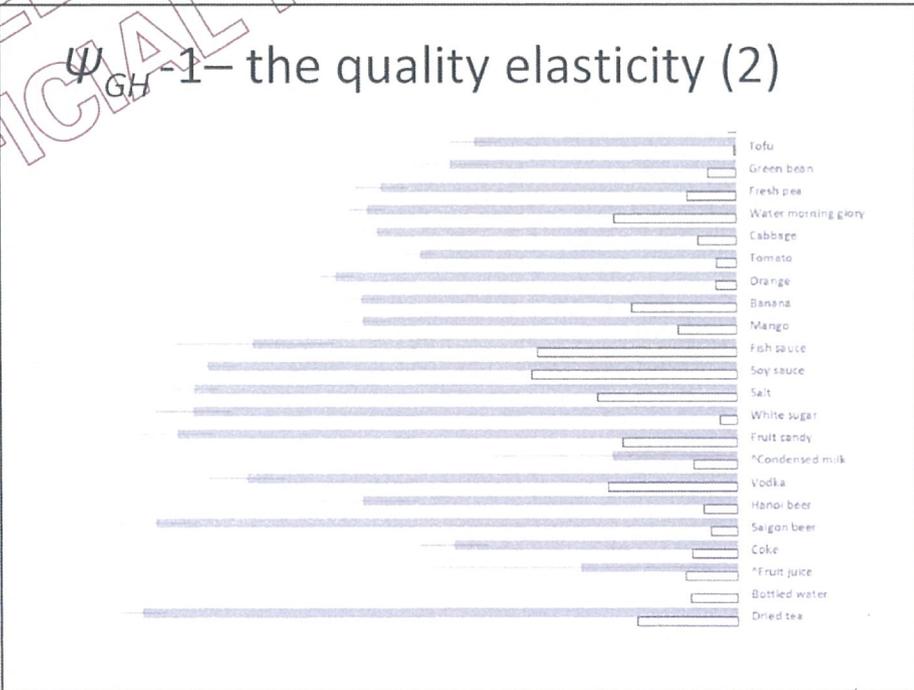
## Summary of results (across 45 food and drink groups)

	Budget-share weighted		Unweighted	
	Mean	Median	Mean	Median
Unrestricted elasticity of quantity w.r.t. own-price	-0.20	-0.14	-0.20	-0.14
Standard price method: elasticity of quantity	-0.79	-0.075	-0.88	-0.94
Own-price elasticity of quantity using Deaton approach to purge quality	-0.60	-0.66	-0.83	-0.80
Quality Elasticity (Standard Price method assumes = 0)				
Unrestricted	-0.60	-0.53	-0.68	-0.66
Deaton method	-0.20	-0.20	-0.05	-0.06

### $\Psi_{GH}^{-1}$ - the quality elasticity



### $\Psi_{GH}^{-1}$ - the quality elasticity (2)



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## Implications for elasticity of quantity demand w.r.t. price

- Directly estimating the effect of price on quality gives much larger effect than the indirect estimates via Deaton's weak separability restrictions
  - Same result found for small area in Indonesia (six-food system) by McKelvey (2011) and for Vietnam in 2010 using eight-food system (Gibson and Kim, 2013)
  - in this setting, and plausibly elsewhere, the estimated elasticity of quantity demanded with respect to price is much smaller using direct estimation than using indirect imputation from Deaton's separability restrictions
  - Naively using single-equation models with either unit values or prices (zero quality response) over-states the response of quantity to price by even more

## Alternative approaches

- Brand level effects
  - If quality is only due to brand, rather than to package size, and survey data include brand details, can use brand fixed effects as a proxy for quality
    - We have a cigarette demand study for Indonesia using this approach (for 17 brands of cigarette)
    - Simulated effect of 10% increase in the excise tax
    - Predicted fall in quantity consumed overstated by 56% when the quality information ignored
  - Scanner study with diff-in-diff from two episodes of SSB tax increases in US finds no decrease in volume of soft drinks consumption in treated areas

## Other sources of overstatement

- Failure to account for storability
  - SSBs are storable for several months so purchase in the survey period need not be for consumption then
    - Wang et al find 65% stockpile SSBs during sales, *stomers* are less price sensitive, and are more prevalent in obese areas
- Wrongful use of censored demand models
  - Focus is changes in population average sugar intake irrespective of whether on intensive or extensive margins → unconditional expected value we need
  - Censored demand (or Tobit) doesn't give this and has to be adjusted down by % of non-limit observations

## Conclusions

- Price elasticity estimates used to model taxes on unhealthy foods conflate quality responses and quantity responses
- Method to untangle these proposed by Deaton in 1980s
  - separability assumptions needed by Deaton's method do not seem to hold in practice
- Both prices and unit values are needed to get unbiased quantity elasticities from budget share equations
  - Part of the budget share response to price is change in choice of quality, so an index of quality like a unit value is needed to remove this response if interested in quantity responses
- quantity demanded of food and drink is likely to be much less price-responsive than is suggested by the studies relied upon by advocates for SSB taxes

- Following emails from Hugh Laurence and from Julie Anne Genter (2 November 2016), you requested information about this recently published study:

Sanchez-Romero LM., et al. 2016. *Projected Impact of Mexico's Sugar-Sweetened Beverage Tax Policy on Diabetes and Cardiovascular Disease: A Modelling Study*. PLoS Medicine: November 1, 2016.

- This study projects the 10 year effects of the 10% tax on sugar-sweetened beverages (SSBs) introduced in Mexico in 2014. Using a number of contestable assumptions it suggests significant changes in CVD events, strokes, diabetes and health care costs.
- It should be interpreted as an "if ... then" study rather than as empirical research predicting the impact of a tax. It does not add new evidence to the debate about whether to introduce a sugar tax.
- The key assumption is that the tax will be fully – or more than fully – passed through to prices and to consumption. In other words, it assumes a 10% tax will generate a 10% or 20% fall in consumption of SSBs.
- This assumes retailers fully pass the tax on to consumers through price rises, as well as assuming that consumers do not respond to any price increase by switching to cheaper brands of SSBs. In fact, we know from other sources that consumers are likely to buy cheaper versions of the same product when prices increase.
- While there were initial reports of a 7 – 12 % decline in SSB sales in Mexico following the introduction of the tax, these reports failed to control for other factors likely to have contributed to declining sales, including active public health and education campaigns and improved access to safe drinking water.
- The appendix gives a more complete summary of the study and a detailed critique of its assumptions.

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## Memorandum: Professor John Gibson's public seminar on taxing unhealthy products, 1 December 2016

To: Hon Dr Jonathan Coleman, Minister of Health

### Purpose

This memo provides background information about Professor John Gibson's forthcoming public seminar in Wellington on 1 December 2016: *Quality, Quantity, and Price: Implications for Taxing Unhealthy Items*.

### Background

Professor Gibson (Waikato University) met with you in June of this year, to discuss his research and the likely impact of a sugar tax. He is back in Wellington this week, to give a public lecture on his research. The lecture is hosted by MOTU, an independent economic and public policy research organisation. MOTU have organised media coverage. Professor Gibson's presentation will be discussed by Professor John Creedy of Treasury and Victoria University of Wellington.

### The seminar's content

Professor Gibson's key and unique insight is that most of the existing empirical literature and evidence overstates the impact of taxes on unhealthy items by not controlling for 'within-category substitution effects'. In other words, most studies do not identify whether any fall in total spending on soft drinks is due to customers switching to cheaper options or to reducing their total consumption. He has underway a research study using data from Mexico and other countries to robustly assess this effect. The study will finish mid-2018.

### Limitations of existing literature

There are of course additional problems with existing studies assessing the likely impact of a sugar or soda tax. We expect that Professor Gibson and the discussant will canvass these. They include:

- Failure to control for other factors influencing any observed decline in purchases, for example in Mexico the introduction of the tax coincided with major initiatives to improve drinking water quality and with a substantial public information campaign.
- Identifying a decline in purchases immediately following the introduction of a tax, but not controlling for stockpiling.
- Relying on unreliable measures of a change in purchases (eg. asking a non-random sample to recall their purchases before a tax is introduced, using only partial measures of purchasing, or measuring purchases at household level rather than individual level).
- Assuming that any change in purchases of taxed items has an impact on calorie intake or obesity (which it won't if the effect is small or consumers switch to other calorie dense products).
- Failing to include the negative impacts of the tax, particularly in a country such as New Zealand with a relatively transparent and simple existing tax structure.

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