

# The Global Fruit & Veg Newsletter



n° 9

April  
2016

## FOOD TAXES & SUBSIDIES

### Edito

In this newsletter you will find summaries of three important articles that have considered health-related food taxes and subsidies written by Cliona Ni Mhurchu, Adam Briggs and Oliver Mytton. Their important work (partially summarised here) has added to the evidence surrounding food taxes and subsidies. The modelling studies described by Briggs and Ni Mhurchu are reminders that it is important to study the full effect of proposed tax and subsidy scenarios, including where possible both targeted foods and potential substitute foods, and vulnerable sub-populations. The review summarised by Mytton reminds us that whilst modelling studies can give in-depth results, it is important to gather evidence on real-life implemented tax and subsidy policies wherever possible in order to validate modelling results and provide policy makers with compelling evidence.

More and more governments, including the UK, Hungary, Finland, France, Mexico and Berkeley, California, are turning towards health-related food taxes (particularly sugary drink taxes). Opinion polling and referenda have shown that such taxes needn't be unpopular. In straitened financial times, fiscal measures will be considered by governments for their revenue raising potential as well as their health outcomes. But evaluating the effect of health-related food taxes and subsidies using randomised controlled trials is usually infeasible, and as such we rely upon results from modelling studies and natural experiments of real-life taxes and subsidies.

**Peter Scarborough**

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Acknowledgement to  
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January 2010 : T. Wijnhoven; C. Le Donne, C. Leclercq; K. Castetbon and colleagues; S. Vandevijvere (The gap between recommendations and real consumption in Europe)  
February 2010: W.P. T. James; A. Takamashi; J. Harrington; DL. Tande and colleagues (Living healthy and feeling better)  
March 2010: J. Blundell; N. Pearson; ML. Frelut; H. Freisling (Fruits and Vegetable consumption determinants among adolescents)  
April 2010: L. Letenneur and colleagues; CR. Gale; S. Sabia; MN. Vercambre, F. Clavel-Chapelon (Fruit and vegetables and cognitive function)  
May 2010: MK. Moos, CH. Chuang, CS. Weisman, AL. Brantsaeter; M. Vujkovic, RP. Steegers-Theunissen (Eating for pregnancy)

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# Evaluating the Health Impacts of Food and Beverage Taxes

Oliver Mytton

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Before I wrote the original article that was published in *Obesity Reviews*, most of my work in this area, had been 'modelling'. Modelling uses economic data to estimate the potential impact of price changes (from taxes or subsidies) on consumption and what that in turn would mean for people's health (see Adam Briggs' article for an example). Whilst I think these studies are important, I began to realise that the evidence these studies generated was only ever going to be part of the evidence jigsaw that policy makers sought.

Policy makers appeared to be much more interested in 'real-world' evidence (i.e. studies of actual taxes), the problem of course was that very few if any countries had introduced such taxes with the explicit aim of improving health. It felt like catch-22.

But in late 2012 that all changed, when Denmark introduced a new tax on saturated fat, in part to address high levels of cardiovascular disease in Denmark. Other countries followed suit, with France taxing sweetened beverages and Hungary introducing taxes on some products high in salt and sugar in 2013. Studying these 'experiments' could provide much richer evidence for policy makers – not just concerning the effect of the tax on consumption of food and health, but other factors: how does industry respond?; are there other economic effects?; what do the public think?

However rigorous scientific evaluation is not easy to do. There are a number of challenges. For example people often hope to link taxes and subsidies directly to changes in health. Sometimes this may be possible, but often it won't.

For example Cliona Ni Mhurchu's work from New Zealand suggests that a subsidy on fruit and vegetables at 20% would lead to a 12% and 18% increase in consumption of fruit and vegetables respectively. That should contribute to reductions in cancer and heart disease, but those reductions won't happen immediately. There are also many other things changing, treatments are improving and smoking is going down. These, and other things, will affect cancer and heart disease, which makes it very hard to point to changes in disease and confidently say those changes are due to a new subsidy or tax. Instead in our review, we suggest the evaluation should focus on changes in consumption. When changes in consumption have been shown to be relatively large, it may be appropriate to look at the effects on some measures of health.

We also highlight the importance of not just focusing on benefits, but also considering potential harms that might occur from taxes or subsidies. If a tax on salt leads to people purchasing fewer salty snacks, then they might compensate by purchasing more sugar-sweetened confectionery. They may also respond to a tax by spending less money on fruit and vegetables in order to absorb the increased cost of the diet. It is important to evaluate the effect of taxes and subsidies across the whole diet rather than just the targeted product.

Ultimately a full understanding of the effect of taxes and subsidies will come from a range of different approaches: evaluation of real policies, as well as modelling studies (like those that Adam Briggs and Cliona Ni Mhurchu discuss).



# Effects of Health-Related Food Taxes and Subsidies on Mortality from Diet-Related Disease in New Zealand: an Econometric-Epidemiologic Modelling Study

Cliona Ni Mhurchu

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## Food taxes and subsidies could promote healthier diets

Poor diets account for a substantial proportion of disease burden worldwide, with the largest dietary risks being low fruit intake and high salt. Improving diets and reducing salt intakes were identified as priorities for international action following the United Nations High-Level Meeting on non-communicable diseases, and a number of countries are implementing action plans to achieve agreed global targets.

Health-related food taxes and subsidies, where the price of unhealthy foods is increased and/or that of healthy foods is decreased, are a potential means to promote healthier diets.

## Implementation and evidence

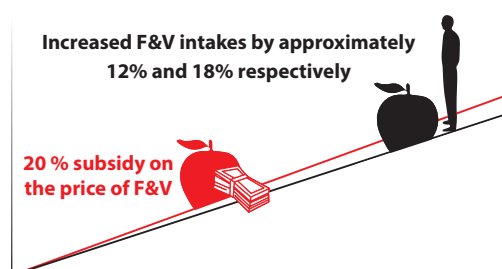
A number of countries have introduced taxes on unhealthy foods, such as soft drinks, and evaluations suggest that they are effective in reducing consumption of targeted foods. The United Kingdom Healthy Start programme offers vouchers for fruit and vegetables to pregnant women on benefits, and Australia exempts fruit and vegetables (and other staple foods) from Goods and Services Tax.

However important gaps in the existing evidence base hinder the adoption and implementation of such policies in many countries. Gaps include the effects of compensatory purchasing of non-targeted food items; impact on different socioeconomic groups; and effects on long-term health and mortality.

## Study design

We aimed to estimate the effects of a range of health-related food taxes and subsidies on deaths from diet-related diseases in New Zealand. We specifically aimed to include any effects of compensatory food purchasing and to evaluate effects by income and ethnicity.

We used a computer simulation model based on New Zealand household food expenditure data, food price elasticity information, and population rates of diet-related disease to model the effects of introducing five tax and subsidy regimens. Changes in death rates from cardiovascular disease, cancer, diabetes and other diet-related diseases were estimated.



## Estimated effects on population health in New Zealand

Our model predicted that a 20% subsidy on the price of fruit and vegetables would increase total population fruit and vegetable

intakes by approximately 12% and 18% respectively, and prevent or postpone about 560 deaths each year (2% annual all-cause mortality). 20% taxes on major dietary sources of saturated fat and sodium would prevent or postpone approximately 1,500 and 2,000 deaths respectively. Estimates were that combining taxes on foods high in saturated fat and sodium with a fruit and vegetable subsidy would prevent or postpone about 2,400 deaths (8% annual all-cause mortality). All effects were similar or greater for Maori and low-income households in relative terms.

## Compensatory purchasing of non-taxed items

With any food pricing policy there is a risk of unintended consequences such as shifts from taxed foods to others that are equally or even more unhealthy. Our models suggest, for example, that a sodium tax could increase saturated fat purchases (by 2%) and decrease vegetable purchases (by 3%). Such effects could offset positive effects of health-related taxes but in this case the overall effects on population mortality rates remained positive. Nevertheless, it is a reminder that consideration of the full implications of any tax or subsidy package on total population diets is critical.

## Some populations could derive greater health benefits from such policies

Our models also suggested that the population groups likely to benefit most from food pricing policies are Māori and low-income New Zealanders because they experience a greater burden of diet-related disease reflecting their higher average BMI and higher risk of cardiovascular diseases and diabetes, and are more responsive to changes in food prices.

## A cost-saving and a cost-effective strategy

Relative to other strategies to prevent obesity and diet-related disease, health-related food taxes and subsidies are likely to be highly cost-effective. Previous studies found that taxes on unhealthy foods and beverages would be cost-saving and considerably more cost-effective than individually-focussed weight reduction programmes or community or school-based education programmes. Whilst subsidising healthy foods like fruit and vegetables is costly, packages of taxes and subsidies may be the best option for both population health and national economies.

## Conclusions

Overall, our research suggests that health-related food taxes and subsidies could improve diets and reduce mortality from diet-related disease in New Zealand. However, there are uncertainties in such modelling, e.g. potential healthier product reformulation by industry in response to taxes and subsidies, which could enhance health gains. Our study adds to the growing evidence base that food taxes and subsidies should improve population health and reduce inequalities, but there is still much room for improvement in the estimation of health impacts.

# Overall and income specific effect on prevalence of overweight and obesity of 20% sugar sweetened drink tax in UK: econometric and comparative risk assessment modelling study

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In 2013, we published a study in the British Medical Journal that estimated that a 20% tax on sugary drinks in the UK could reduce the number of obese adults by 180,000 as well as raise around £275 million per year.

High rates of obesity and diabetes have major implications for healthcare systems across much of the developed and developing world. One approach to tackling these problems is to tax drinks with added sugar, or sugar-sweetened beverages (SSBs).

## Why tax sugar-sweetened beverages

Taxes on SSBs have been introduced in countries such as France and Mexico, and are being discussed in others such as South Africa and Ireland. Both per unit taxes and sales taxes have either been implemented or discussed, with a broad consensus that in order to have a meaningful effect on consumption, and therefore health, tax rates should approach 20% of the sale price. SSBs are a particularly appealing target for policy makers and health professionals for many reasons:

- there is increasing evidence that SSB consumption is bad for health (leading to both obesity and diabetes);
- SSBs offer no nutritional value aside from calories;
- their substitutes are likely to be healthier;
- people don't tend to replace calories in SSBs by eating more; and
- SSBs are easy to define from a legislative perspective.

As such, a growing number of UK professional, governmental, and charitable organisations have come out in support of an SSB tax over the past two years, including the government's Health Select Committee, Public Health England, the Academy of Medical Royal Colleges, and Cancer Research UK. This has all led to the tax imposed on manufacturers of SSBs announced by the UK government in March this year (to be introduced in 2018).

We aimed to inform the UK debate on SSB taxes in 2013 by modelling the possible effect on obesity prevalence of a 20% sales tax for people of different age, gender, and income groups.

We defined SSBs as cold drinks with added sugar, including energy drinks but not including pure fruit juice. We modelled the effect of a 20% tax in two steps.

## First step: People's reaction to price changes

The first step was to calculate how people would react to the price change, both for SSBs as well as for other drinks people may switch to. This was done using a national survey of household purchases called the Living Costs and Food Survey. Using shopping data from over 5000 households it is possible to estimate how people react to price changes of different food and drink products. Furthermore, this can be done separately for households with different incomes thereby allowing us to estimate how different income groups would change their purchasing habits. This told us the post-tax percentage change in purchases of SSBs as well as other drinks including diet soft drinks, milk, and fruit juice.

## Second step: Modelling the shift in purchasing behaviour on obesity rates

The second step was to model what the changes to purchases might do to obesity rates in the UK. We used data on the volume of SSBs drunk for three age groups (16-29, 30-49, and 50+ years) and three income

groups taken from the National Diet and Nutrition Survey, a UK survey of food and drink consumption. The income-specific responses to the tax estimated in step one were used to predict the changes to SSBs consumed for three different age groups in each of the three income groups. The resulting change to calorie intake was used to estimate the effect on obesity in the UK population as a whole, and on different income groups and age groups. We also calculated the potential tax revenue and how this would differ between income groups.

## Obesity rates should decrease with taxes on SSBs

We found that a 20% tax could reduce the consumption of SSBs by about 15%, with the drinking of diet soft drinks, fruit juice, milk, and tea and coffee all increasing by between 3% and 4% to compensate. Overall, this would reduce the average daily energy intake by four kilocalories, however that number differs markedly by age. Younger adults (aged 16-29) would see the greatest reduction in daily calories intake (falling by over 13kcal) whereas there would be no change for adults aged over 50 years.

Overall, we predicted that the number of obese adults in the UK would fall by around 1.3%, or 180,000. The greatest impact would be among those aged 16-29 years where obesity rates would fall by 7.6%, compared to no change for adults aged over 50 years.

## A similar effect on obesity among income groups

One of the main concerns about any type of sales tax is that they are regressive – those who are poorer end up spending a greater proportion of their income on the tax than those who are richer. Logically it might be expected that poorer populations would experience greater health benefits than those who are richer. This is because unhealthy behaviours and risk factors are often found more in poor rather than rich people, and it would generally be expected that poorer people would respond to price increases more. Surprisingly, our results suggested that there would be little difference in the effect on obesity by income group.

## A step forward

Finally, we estimated that the tax would raise around £275million with each adult spending on average an extra 8p per week on drinks, or £4.20 per year. This would be more keenly felt in the poorest income group where adults would spend an extra 9p per week compared to 6p in the highest income group.

The work was not without its limitations. In dietary surveys, people often underestimate how much unhealthy food they eat, and over-estimate the amount of healthy food, we also assumed that all drink bought would be consumed, and that individuals of all ages would react to the price change in the same way. However, at the time our study provided the best estimate of what effect a tax on SSBs may have on obesity in the UK.

Taking this work forward, it is unlikely that more detailed modelling studies are going to be of much use to policy makers around the world. Instead I think we need to rigorously evaluate the how individuals and industry react in countries that have introduced an SSB tax, both in the UK and elsewhere. Mexico is a prime example of this. Data from the first year of their peso per litre tax (about a 10% price increase) showed a 6% reduction in purchases, not dissimilar from the 15% reduction we estimate from a 20% UK tax.