

SWEET NOTHING

Real-World Evidence of Food and Drink Taxes and their Effect on Obesity

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EXECUTIVE SUMMARY

Proposals for food and drink taxes have grown considerably in recent years, particularly at the municipal level. Initial recommendations for small taxes on soft drinks of approximately 5%, for example, have recently been replaced with demands for tax rates of 20% or more. (See page 6)

Food and drink taxes, and in particular soda taxes, are often presented as a simple and convenient solution to rising rates of obesity. (See page 2)

Experience in countries and cities with soda taxes reveals demand for beverages tends to be inelastic, which makes these products poor choices for control via taxes. (See pages 7-9).

Food and drink taxes encourage cross-border shopping, as consumers seek out cheaper alternatives. There is clear evidence of this in Berkeley, CA, Denmark and Philadelphia. (See pages 7, 11, 18-19)

Consumers frequently substitute untaxed but equally caloric food and drink products to replace taxed items in order to maintain a constant diet. This is the experience in the U.S. and Hungary. (See page 10)

The human body's dynamic metabolic adjustment resists the effect of externally-imposed diets. Because of this, predictions of weight loss due to food and drink taxes habitually overstate actual results. (See page 10)

Real-world evidence from countries that have imposed food and drink taxes, including the United States, Mexico, France, Hungary and Denmark shows no discernible improvement in obesity rates or Body Mass Index (BMI). In fact, BMI in these countries has increased or remained stable following a new tax. (See pages 11-14)

There is evidence suggesting soda consumption and obesity are entirely unconnected. Between 2004 and 2015 Canadian per capita soda consumption fell 27%, and overall sugary drink consumption declined by 12% while obesity rates rose for both men and women. (See page 13)

Food and drink taxes are among the least cost-effective and least-efficient obesity interventions. According to consultants McKinsey & Company, out of 16 possible strategies, food and drink taxes are ranked 13th, and assigned the lowest possible rating for evidentiary strength. (See page 15)

Food and drink taxes are regressive and would disproportionately affect low-income Canadians. (See page 17)

New food and drink taxes often cause unintended negative consequences. A new soda tax in Philadelphia has arbitrarily benefitted suburban grocery stores at the expense of urban stores, and thus threatens the availability of nutritious food in low-income, downtown core areas. (See pages 18-20)

Despite their ineffectiveness in reducing obesity or improving health, food and drink taxes remain an attractive new source of revenue for government. This, however, should not be considered an argument in their favour. Judged by the standards of good tax policy – equity, efficiency and necessity – food and drink taxes fail on all counts. (See page 21)

INTRODUCTION

Like a dropped bottle of pop, food and drink taxes have exploded across the public policy landscape with surprising speed and force. Driven by a perceived need to tackle obesity, governments around the world – in both developed and developing countries, and at the local and national levels – have unveiled a wide range of new taxes on food and beverages. France, Denmark, Hungary and Mexico have all enacted such policies in recent years, as have several major U.S. cities.

Supported by comprehensive lobbying campaigns from well-funded public health activist groups, the objective behind these new taxes is to forcibly change public dietary habits. By making certain high-calorie foods more expensive, consumers are expected to alter their diet and consume fewer calories. Claims that taxes can reduce obesity are supported by studies typically funded by these same advocacy groups. In Canada, for example, a 2017 report paid for by a coalition of public health organizations argues a 20% soda tax applied over the next 25 years will save 13,000 lives, dramatically reduce the overall weight of the average Canadian and prevent hundreds of thousands of cases of specific diseases, such as diabetes, cancer and heart disease. As is the case with any public policy proposal, however, any claims made on behalf of a tax on soda or other food and drink must be carefully scrutinized. Can taxes really have a permanent and noticeable effect on diet and disease on a national scale?

This paper examines the theoretical arguments behind the argument that food and drink taxes can reduce obesity and improve public health. These arguments will then be tested against real-world evidence from jurisdictions that have recently adopted such policies. This paper can thus be considered a follow-up to an earlier Canadian Taxpayers Federation report *Tax on the Menu: Why taxing food and drink won't make Canadians thinner. But will make their governments much, much fatter* released in 2013. The availability of ample

new research, both in the scientific literature and from the recent implementation of food and drink taxes around the world, provides the motivation for this update. The results, however, have not changed.

Despite the rising clamor for new and higher food taxes, a clear-eyed review of the facts reveals a striking absence of success over the long-term. While fiscal food measures may succeed in making certain products more expensive, the scale of these price changes is uncertain. While consumers do respond to price incentives, often these reactions are unpredictable or confounded by competing motivations – undermining efforts to control diets through the tax system. Ample real-world evidence also reveals an absence of any link between soda consumption and national rates of obesity. The ultimate effect of tax measures on diet is typically so small as to be utterly insignificant. In some cases, efforts to improve diets via taxes have had unintended consequences that could worsen overall health. As a result of new soda taxes, for example, consumption of beer and other alcoholic beverages may increase. Or the availability of nutritious food in low-income downtown areas may be threatened. Subsidies given to promote the purchase fruits and vegetables can similarly cause sales of 'unhealthy' snack foods to increase in tandem. Results of this sort point to the great complications involved in attempting to engineer the public diet through the tax system.

Despite aggressive and urgent demands made by public health lobby groups, the preponderance of evidence shows food and drink taxes have no discernable impact on obesity. For this reason alone, Canada should avoid them.

PART ONE:

FOOD AND DRINK TAXES IN THEORY AND PRACTICE

It has become conventional wisdom that the recent increase in global obesity rates is the result of a modern diet high in sugar and fat. Certain foods and drinks have been singled out as the main culprits in this scenario: in particular sugar-sweetened soft drinks. As a result, efforts to reduce obesity at a national or local scale have often fixated on the need to raise the price of these products in order to convince the public to consume less of them.

The notion that food and drink taxes can produce a thinner and healthier population is a simple and intuitively appealing concept. In theory, it seems a reasonable assertion. But it deserves a closer look. For food and drink taxes to successfully lower national obesity rates, consumers must act exactly as food and drink tax proponents claim they should. In particular, four important and linked conditions must be met. If any one of these linkages is proven to be unreliable the entire concept necessarily fails.

Food tax condition 1: Taxes on 'unhealthy' food and drink must raise prices by an amount similar to the tax.

Food tax condition 2: Consumers must respond to higher prices by buying proportionately less of the taxed food and drink.

Food tax condition 3: Consumers must not substitute other, equally-caloric products to replace any decrease in consumption of taxed food and drink.

Food tax condition 4: Any reduction in overall calories consumed as a result of food and drink taxes must lead to a noticeable decline in obesity

In addition to scrutinizing the academic literature for theoretical or predictive arguments regarding food and drink taxes, this paper will also make ample use of the experiences of jurisdictions that already impose such taxes. Testing these four tax conditions against real-world evidence is a necessary step in evaluating these policies.

Countries of interest include:

United States

The U.S. has a long record of taxing soft drinks and candy at the state level. There are currently 33 states with soda taxes, ranging in value from 2% to 7%. Many of these taxes date back to the Great Depression and were imposed for revenue purposes. This lengthy experience with soda taxes of varied magnitude offers a rich data source for evaluating the effectiveness of taxes on changes in obesity. More recently, U.S. municipalities have begun to enact soda taxes for explicit public health purposes. In 2015, Berkeley, California became the first U.S. city to impose a penny per ounce tax on sugar-sweetened soft drinks with the goal of reducing local obesity rates. Many large metropolises have since followed, including Philadelphia, Seattle, Chicago and San Francisco.

Denmark

In 2011, Denmark imposed the world's first fat tax at a rate of approximately \$3 (all figures Canadian except where noted) per kg of fat for all foods with more than 2.3% fat content. This was administratively complex, as it covered butter, margarine and chips but exempted some products with a healthful image, such as milk or nuts. Meat was taxed at a standardized rate regardless of the actual fat content of a particular cut or selection. Widespread public displeasure at the tax and its implications led to its repeal 15 months later. In 2014 Denmark also eliminated a tax on soft drinks that had been in place for decades and cancelled plans for a new sugar tax.

Hungary

In 2011, Hungary created a whole suite of taxes on food and drinks deemed to have excess amounts of sugar, salt and caffeine. The Public Health Product Tax, (better known by its Hungarian acronym 'NETA') applies to a wide variety of soft drinks, candy, salty snack foods, condiments and even breakfast jam.

France

In 2012, France imposed a flat rate excise duty of approximately 9¢ per litre (or about 5%) on all soft drinks, regardless of whether artificially or sugar sweetened. The tax rate is adjusted annually for inflation. A higher tax rate of \$1.50 per litre was imposed on energy drinks in 2014.

Mexico

In 2014, Mexico enacted a tax of approximately 10% (one peso per litre) on all sugar-sweetened beverages, excluding dairy or alcoholic beverages, as well as an 8% tax on ‘junk food’ such as chips and candy. This tax has been closely scrutinized within the soda tax debate.

Canada

While Canada has avoided specific food and drink taxes to date, the Northwest Territories government has announced plans to introduce a soft drink tax in the 2018/2019 budget year. In advance of this development, current Canadian trends offer important lessons about the reliability of food and drink tax proposals, as well as projections regarding disease prevention and weight loss.

As real-world experience from these countries is crucial to evaluating the usefulness of food and drink taxes in lowering obesity, significant or important results from around the world will be highlighted with our SPOTLIGHT feature and an identifying flag.



PART TWO: ASSESSING THE ARGUMENTS

The role and efficacy of food and drink taxes has become a contentious public policy battle ground. It is common for the arguments of industry groups representing retailers or soft drink manufacturers to be dismissed out-of-hand as examples of obvious and self-interested lobbying efforts. While such groups can be expected to argue to their own advantage, it bears mention that many voices opposing them are equally self-interested. Some of the most vocal and prominent advocates of food and drink taxes have staked their careers and reputations on the implementation of such policies. These campaigns may also be driven by a personal animosity towards corporations or capitalism in general. Barry Popkin, a professor of nutrition at the University of North Carolina, for example, is a prolific researcher of soda taxes and frequent media commentator on this topic. Popkin tellingly describes himself on his personal website as a “political activist” with a “Marxist and Maoist perspective.”¹ Not all academic researchers should be considered dispassionate or unprejudiced investigators.

Similarly, many studies claiming to assess the usefulness of food and drink taxes have received funding from organizations that promote such policies as a core belief. Consider, for example, the Bloomberg Philanthropies. Set up by billionaire and former New York City Mayor Michael Bloomberg – who once tried to ban the sale of large-serving soft drinks in New York City – the Bloomberg Philanthropies has as its explicit goal “raising taxes on sugary drinks”² and seeks to fund projects that further this objective. In Canada, the Heart & Stroke Foundation is equally well-known for its aggressive advocacy of taxes on sugary drinks. With this as background, when the Heart & Stroke Foundation commissions a report from university researchers examining the effects of a 20% soda tax on public health, the study itself should be seen as an extension

of its ongoing lobbying efforts. Studies funded by advocacy organizations should always be considered in light of their predisposition towards soda taxes as favoured policy, in the same way that studies funded by the soft drink or retail industry might be considered to favour the contrary position. It is also relevant that such proposals for food and drink taxes often recommend that the tax revenue raised be spent on health promotion activities of the sort already provided by these very organizations. Financial self-interest may thus be considered a factor in the promotion of food and drink taxes.

The complication of partisan allegiances and prejudices within the food tax debate points again to the necessity of carefully compiling and examining real-world experience. This may be our only source of unbiased evidence.

¹ The Nutrition Transition website. “[Popkin background](#),” Accessed April 4, 2017

² Bloomberg Philanthropies website. “[Obesity Prevention](#),” Accessed November 14, 2017.

PART THREE: PUTTING FOOD AND DRINK TAXES TO THE TEST

FOOD TAX CONDITION 1:

Taxes on ‘unhealthy’ food and drink must raise prices by an amount similar to the tax

The obvious goal of taxing ‘unhealthy’ food and drink is to make these products more expensive to consumers. But how expensive? In an influential 2000 article Kelly Brownell, currently dean of the Sanford School of Public Policy at Duke University, argued for a “small” national soft drink tax in the U.S. of approximately 5% as an effective means to reduce consumption.³ In recent years, however, Brownell, as well as his frequent co-author Barry Popkin, have taken to arguing for much larger taxes – in the range of 20% or more.⁴

This upsizing of soda tax demands is a response to evidence that small taxes at the U.S. state level have failed to reduce consumption by any noticeable amount.⁵ To overcome this obstacle, tax proponents now assert that bigger taxes can produce results where small taxes have not. To test whether there is something unique about a ‘big’ tax increase, American researchers examined the impact of greater-than-normal soda tax increases enacted in 1992 in Arkansas and Ohio. They compared the results on soda and calorie consumption in these two states against states that had similar population weight profiles but did not impose similarly large soda taxes. Their conclusion: “Our results cast serious doubt on the assumptions that proponents of large soda taxes make on its likely impacts on population weight.”⁶

Regardless of whether food and drink taxes are large or small, most tax proponents assume any new tax will raise the price of the targeted product by an amount similar to the official tax rate. Such a claim depends on the form of tax imposed. In the case of a retail sales tax paid by consumers at the counter – as is the case with the HST or provincial sales taxes – this is a reasonable assumption to make. However, most food and drink tax advocates argue instead for an excise tax applied at the manufacturer level. Excise taxes are assumed to be easier to collect and more effective at convincing consumers to buy less, since they raise the ‘shelf price’ of a product. However, real-world experience suggests a much more complicated process is at work than first appears. Regardless of the size of an excise tax, the final shelf price still depends on market-place decisions. If food manufacturers or retailers decide consumers will react strongly and negatively to a price increase, it is possible they will raise prices by less than the full amount of the tax. This will tend to mute the desired impact of a tax on consumers. On the other hand, sellers may decide to raise prices by more than the excise tax. This could be the case if they have resisted price increases in the past and/or estimate the market can bear a new, higher cost. This will tend to exacerbate the tax effect. It is also possible prices will rise by the exact amount of the tax as originally intended. There is recent evidence for all three scenarios.

³ Jacobson, Michael and Kelly Brownell. “[Small Taxes on Soft Drinks and Snack Foods to Promote Health](#),” in *American Journal of Public Health*, Vol. 90, No. 6 June 2000.

⁴ Brownell, K.D. et al. “[The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages](#),” in *New England Journal of Medicine*, Vol. 361, No. 16, 2009

⁵ Fletcher, Jason et al. “[Can Soft Drink Taxes Reduce Population Weight?](#)” in *Contemporary Economic Policy*, Vol. 28 Issue 1 January 2010.

⁶ Fletcher, Jason M. et al. “[Non-linear effects of soda taxes on consumption and weight outcomes](#),” in *Health Economics*, Volume 24 March 2015.



SPOTLIGHT ON BERKELEY

In 2015, Berkeley, CA became the first U.S. city to enact a penny per ounce excise tax on sugar-sweetened soft drinks, energy drinks and iced teas. Alcohol, 100% fruit juices and milk products are exempt, regardless of sugar content. Using in-store data, economists John Cawley and David Frisvold examined prices before and after the tax in Berkeley and surrounding cities. Rather than being fully passed on to consumers, their data shows retail prices rose by only 43% of the tax. The researchers fingered “cross-border shopping to evade taxes on food” as the likely culprit for this scenario. In response to the tax, Berkeley residents simply drove elsewhere to buy their pop. Stores in Berkeley were forced to lower prices or lose customers. The tax thus had less than half its intended effect at the check-out counter.⁷ Berkeley’s experience suggests substantial problems for any local or provincial jurisdiction contemplating a tax on soda or other easily transported food and beverage.

A recent comparison of beverage prices in contiguous regions of France (which has a specific beverage tax) and Italy (which does not) reveals a surprisingly wide range of results. Prices of regular sweetened soft drinks appeared to be relatively unaffected by the appearance of the tax, whereas fruit drinks and diet sodas saw much more dramatic price increases. This further suggests retailers may have considerable scope to affect the transmission of a beverage excise tax.⁹

In summary, this food tax condition is not consistently met. The tax pass-through rate may be higher or lower than the actual excise tax due to market behaviour.

FOOD TAX CONDITION 2:

Consumers must respond to higher prices by buying proportionately less of the taxed food and drink

Just as it seems obvious (but has been proven incorrect) that a new excise tax will inevitably raise the price of an item by the exact amount of the tax, it may seem equally obvious that raising the price of a product will lead to an equivalent drop in consumption. While it is reasonable to expect consumers to respond to price increases by reducing consumption, it is a mistake to assume this decline will exactly match the size of the tax, particularly when the product in question is a necessity such as food.

The connection between price increases and purchasing decisions depends on how consumers perceive the value of a product and the nature of their demand for it. Economists call this relationship ‘elasticity.’ Products are considered to be elastic if demand falls by more than the amount of a price

Elsewhere there is evidence of price increases exceeding the value of an excise tax, which can enhance the tax’s price effect. In Hungary, the actual price change for regular cola following the imposition of the NETA public health tax was 5.3%, whereas the tax alone was equivalent to a 3.1% price rise. Over-shifting of new food and drink taxes has also been identified in other countries.⁸ This phenomenon may be the result of simultaneous changes to the cost of inputs, such as raw materials or labour. It may also reflect opportunism on the part of manufacturers or retailers. Whatever the reason, external factors such as competition, geography and market opportunities can confuse or complicate the imposition of a new tax.

⁷ Cawley, John and David Frisvold. “[The Incidence of Taxes on Sugar-Sweetened Beverages: The Case of Berkeley California](#),” NBER Working Paper No. 21465. August 2015

⁸ Ecorys. “[Food taxes and their impact on competitiveness in the agri-food sector](#),” July 2014

⁹ Etile, Frabrice et al. “[The Incidence of Soft-drink Taxes on Consumer Prices: Evidence from the French ‘Soda’ tax](#).” Working paper presented at the 34èmes Les Journées de Microéconomie Appliquée, June 2017

increase. This is often the case with luxury or non-essential goods such as airline tickets or diamond jewelry. If demand falls by less than the price change, the product is said to be inelastic. Necessities, such as electricity or gasoline are generally considered to face inelastic demand since it is impossible or very difficult to live without them. Understanding the elasticity of soft drinks and other 'unhealthy' food and drink is crucial to evaluating the potential impact of a food or drink tax.

If demand for soft drinks is inelastic, efforts to control purchases through taxes will always fail to live up to expectations. Consumer may reduce their consumption of taxed products by a percentage substantially less than the amount of the tax. In this way they resist the efforts of food and drink tax proponents to control their diet. Consumers may also choose to hoard a product in advance of an announced tax. This activity will initially show up as a decline in consumption, but over time, as household stashes are depleted, demand will return to earlier levels. It is also possible that after initially reducing demand due to a tax, consumers will subsequently decide the product is sufficiently important to them that they revert to their original, pre-tax consumption levels. On the other hand, if demand for soft drinks is elastic consumers will cut back on their consumption by an amount greater than the tax, enhancing the net effect of the tax.

Studies promoting the efficacy of soda and other food and drink taxes typically assume demand for these products is elastic.¹⁰ This has the effect of exaggerating expected results since it assumes consumers will react strongly to a new tax. However, real-world evidence suggests the opposite is true. Demand for soda appears to be inelastic, as demand usually falls by an amount smaller than the tax itself.

A 2014 report by the consulting firm Ecorys for the European Commission examined the impact of changing prices on the food industry in Denmark, Finland, France and Hungary following the imposition of food and drink taxes in those countries.

The findings suggest demand for soft drinks and fatty foods tends towards inelasticity. In the first year of the Danish fat tax, for example, the price of butter rose by 13%, but demand fell by only 5%. Consumption of sugar-sweetened cola in France fell by just 3.3%, despite a 5% price rise due to the tax. And a 3.5% price rise for candy in Hungary following NETA had no apparent impact on demand. "Decreases in demand following the introduction of food taxes are generally proportionately smaller than the price increase, which is evidence of inelastic food demand," the Ecorys report concludes.¹¹



SPOTLIGHT ON MEXICO

A 10% soda tax introduced by Mexico in January 2014 has been widely hailed as a successful and important public health intervention. According to academic research by Popkin and co-authors in the *British Medical Journal* (and funded by the Bloomberg Philanthropies), the 10% tax resulted in a 6% drop in soda sales over its first full year, after adjusting for various factors.¹² A follow-up article by the same research group calculated the overall reduction in demand in sugary beverages during the first two years at a 7.6% decline.¹³ While the tax has exceeded revenue expectations, the fact consumption has fallen by less than the amount of the tax suggests demand tends towards inelasticity. Why might consumers choose to drink soda despite the fact it is now more expensive? Habits and preferences are obvious factors. Municipal water supplies are often unreliable and soft drinks are considered a safe and convenient form of hydration in Mexico.

It should also be noted the Popkin study uses an opaque method of calculating soda consumption based on weather, demographics, sales trends and other factors chosen by the investigators themselves – investigators who have previously identified themselves as ardent proponents of soda taxes and whose work

¹⁰ Jones, Amanda et al. "[The Health and Economic Impact of a Tax on Sugary Drinks in Canada.](#)" University of Waterloo School of Public Health and Health Systems. February 2017

¹¹ Ecorys, 2014.

¹² Colchero, Arantxa et al. "[Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study,](#)" in *British Medical Journal* 352, h6704 January 2016

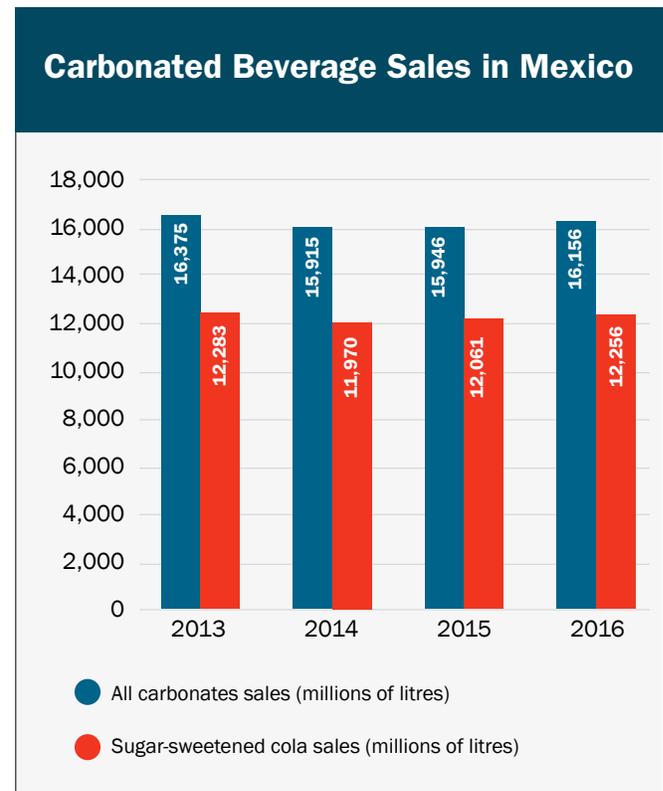
¹³ Colchero, Arantxa et al. "[In Mexico, Evidence of Sustained Consumer Response Two Years After Implementing a Sugar-Sweetened Beverage Tax,](#)" in *Health Affairs* Vol. 36, No. 3 March 2017

is funded by the stridently pro-soda tax Bloomberg Philanthropies. The status of Mexican soda demand is described quite differently by impartial observers. Market research firm Euromonitor, for example, recently summarized the situation as follows:

After the special tax on sugar-sweetened beverages which entered into force in 2014, the soft drinks industry neared full recovery in 2016. Aided by new product launches by manufacturers, and by readjustments in the budgets of consumers, soft drinks is observing sustained growth.¹⁴

Euromonitor sales figures for Mexico reveal that while sales of carbonated beverages declined from 16,375 million litres in 2013 to 15,915 million litres in 2014 in the year following the new tax, consumption has since rebounded to 16,156 million litres in 2016 and appears to be growing steadily. The same trend is visible with sugar-sweetened cola drinks, the single biggest drinks category in the country. On a per capita basis, soda consumption is once again rising in Mexico. This can be considered further evidence of inelastic demand.

In summary, food and drink taxes can be expected to reduce consumption, but generally by a smaller amount than would be expected by the size of the tax because of inelastic demand. It is also possible that tax-induced reductions will lessen, or even disappear completely, over time as consumers return to their previous habits. All this is evidence that consumers resist the full impact of any intended tax diets.



Source: Euromonitor, Feb 2017

¹⁴ Euromonitor. “[Soft Drinks in Mexico: Executive Summary](#).” February 2017



FOOD TAX CONDITION 3:

Consumers must not substitute other, equally caloric products to replace any decrease in consumption of taxed food and drink

In the theoretical world of a central food planner, food and drink taxes will be passed-through fully to consumers, who in turn will reduce their consumption of these unhealthy products by the same amount as the tax. However, even if these two conditions are always met (which we have seen is not the case) there are several other ways in which taxes can fail to produce any permanent change in diet or weight.

First, there is ample evidence the human body unconsciously seeks to maintain a constant weight through dynamic metabolic adjustments. Following externally imposed diets or gastric bypass surgery, for example, the rate of weight loss caused by any reduction in calories appears to fade over time.¹⁵ The same is true for a diet imposed by taxation. Recent research on the efficacy of soda taxes found most tax studies incorrectly assume a straight-line connection between calorie reduction and weight loss, an assumption that dramatically overstates actual reduction in weight caused by soda taxes.¹⁶ Over time, any externally-imposed reduction in calories will gradually diminish in effectiveness, a phenomenon that frustrates plans to tax Canadians thinner.

Second, consumers may deliberately seek out cheaper – but equally caloric – substitutes to replace food and drink that has been made more expensive through taxes. In the same way that the body seeks to maintain a target weight, so too consumers may purposefully decide to keep their daily intake of calories at a certain level regardless of public policy interventions. Given the substantial data set provided by the U.S.'s decades-long experience with state-level soda taxes, such substitution effects are easily tested.

SPOTLIGHT ON USA

Health care researcher Jason Fletcher of the School of Public Health at Yale University and two co-authors found that when confronted with a soda tax, consumers tend to switch to milk and juice beverages, which may contain as much or more sugar as soft drinks. The end result is no overall change in total calories consumed. “The results show that there is no statistically significant impact of the soft drink tax rate on total calories,” Fletcher and his co-authors conclude. “Any reduction in soft drink consumption has been offset by the consumption of other calories.”¹⁷ Similarly, another U.S. field study involving over 100 households’ actual purchases found that a 10% increase in soda prices led to a noticeable growth in beer consumption.¹⁸

Confounding outcomes caused by consumers substituting high calorie or alcoholic products in place of ‘unhealthy’ taxed food or drink are exceedingly commonplace in the academic literature. A 2011 Australian experiment in which children were fed low-fat dairy products found no change resulted in overall calories consumed as the subjects increased their intake of non-dairy calories.¹⁹ And in Hungary, the NETA tax on salty snacks led to increased purchase of popcorn, which is not taxed but can be just as salty and fatty as chips or nuts.²⁰

Besides caloric substitution, there are other ways in which consumers may seek substitutes for taxed products. According to Ecorys’ report on the European experience with food taxes, consumers display a robust interest in switching products or stores to save money and/or maintain existing food and drink choices.²¹ Depending on the nature of the tax, Ecorys notes that consumers may switch from premium brands to generic products, or choose to shop at discount stores. Switching

¹⁵ Cummings, David E. et al. “[Plasma Ghrelin Levels after Diet-Induced Weight Loss or Gastric Bypass Surgery](#)” in *New England Journal of Medicine* Vol. 346, No. 21. 2002

¹⁶ Lin, Biing-Hwan et al. “[Measuring weight outcomes for obesity intervention strategies: The case of a sugar-sweetened beverage tax](#),” in *Economics and Human Biology* 9 (4): 329-341. December 2011.

¹⁷ Fletcher et al. 2010

¹⁸ Wansick, Brian et al. “[From Coke to Coors: A Field Study of a Fat Tax and its Unintended Consequences](#),” Available at SSRN 2079840 (2012) July 29, 2014

¹⁹ Hendrie, Gilly and Rebecca Golley. “[Changing from regular-fat to low-fat dairy foods reduces saturated fat intake but not energy intake in 4-13 year old children](#),” in *American Journal of Clinical Nutrition*. May 2011. Vol. 93, No. 5

²⁰ Ecorys, 2014

²¹ Ecorys, 2014

behavior of this sort will also undermine the intended outcome of the tax by limiting the full impact of the tax on retail prices.



SPOTLIGHT ON DENMARK

The 2011 imposition of the fat tax in Denmark led to a massive public outcry and its repeal 15 months later. While the impact it had on personal food choices was largely to blame for the fact that nearly 80% of Danes disapproved of the tax, a bigger concern for government was the effect it had on employment and shopping habits. In announcing the repeal of the tax, the Danish finance ministry stated, “It is believed that the fat tax has... contributed to Danes traveling across the border to make purchases.”²² Stores in Germany eagerly displayed “No fat tax here!” signs to lure Danish customers.

The likelihood that the tax would push Danes to buy taxed-goods in Germany or Sweden was raised by businesses and trade unions prior to its imposition. And while cross-border shopping had been in long-term decline prior to the tax, it rose from \$1.8 billion to \$2 billion in the first year of the tax. Also in the first year, the Danish retail food industry estimated job losses at 1,300. According to polls, 57% of Danish households shopped in Germany, up from 47% prior to the tax.²³ The willingness of Danish consumers to travel considerable distances to buy familiar foodstuffs, such as butter or meat, demonstrates the difficulty in using food and drink taxes to control individual food choices. The same impulse to shop elsewhere to avoid taxes is visible in more recent experience with American cities imposing soda taxes. (See Part Five.)

The above results suggest an absence of any reliable link between soft drink consumption and obesity. While this observation may be frustrating or inconvenient for proponents of food and drink taxes, it is not unexpected. Recent research shows, for example, that there is no discernible link between

eating a diet that follows Canada’s Food Guide – which deliberately excludes soft drinks, candy and salty snack foods – and observed obesity. In a study of nearly 20,000 Canadians and how their diets compare to national food guide standards, the researchers conclude “we failed to observe a significant association between adherence to [the standards of the food guide] and Body Mass Index, which is in line with some previous studies.”²⁴ Diet and weight gain are extremely complex issues and it is naïve and unscientific to expect a simple solution such as a soda tax will have a noticeable and direct impact on the human metabolism.

In summary, substitution effects – seeking out alternative untaxed foods or altering shopping behavior – play an important role in how food and drink taxes affect caloric intake. Consumers display a habitual disregard for abiding by the demands of public health campaigners. The same goes for the human body’s dynamic metabolic response to an externally-imposed diet. These phenomena dramatically undermine the effectiveness of food and drink taxes, and may render them entirely ineffective.

FOOD TAX CONDITION 4:

Any reduction in overall calories consumed as a result of food and drink taxes must lead to a noticeable decline in obesity statistics

For food and drink taxes to have a real and meaningful impact on obesity, any overall reduction in calories prompted by the tax must have a permanent effect on national statistics.

Food tax advocates have long claimed a direct link between a soda tax and reduction in population-wide obesity rates. However, these assertions are typically based on predictive or speculative assumptions. A 2013 article in the *Journal of Health Economics*, for example, uses mathematical models to declare that a 20% soda tax will inevitably lead to an immediate population-wide weight loss of 1.6 pounds in the first year,

²² Skatteministeriet. “[Lavere afgifter for forbrugere – bedre konkurrencevilkår for virksomhederne.](#)” Danish Finance Ministry press release (in translation), November 10, 2012.

²³ Snowdon, Christopher. “[The Proof of the Pudding: Denmark’s fat tax fiasco.](#)” Institute for Economic Affairs. May 2013

²⁴ Jessri, Mahsa et al. “[Assessing the Nutritional Quality of Diets of Canadian Adults Using the 2014 Health Canada Surveillance Tool Tier System.](#)” *Nutrients*, Vol. 7, Issue 12 December 2015

and a cumulative loss of 2.9 pounds in subsequent years in the United States.²⁵ Similar arguments regarding Mexico's 2014 soda tax claimed the tax would result in a two to four pound reduction in mean population weight, or up to 2.7% of total body mass.²⁶ Almost all studies that claim to prove soda taxes produce positive health benefits rely on abstract computer modelling exercises rather than evaluations of real-world evidence.²⁷

Testing these speculative claims is relatively simple. Changes of more than a pound per person in a population's body weight over a single year would immediately show up in national Body Mass Index (BMI) data, a measure used to calculate obesity rates.²⁸ Applying these predictions to the facts on the ground in countries with existing food and drink taxes, however, reveals no visible evidence of any change in national BMI figures. Among our target countries currently experimenting with food taxes – United States, Hungary, France, Denmark and Mexico – there have been no reductions in national BMI throughout the period of implementation of food and drink taxes.²⁹ In most countries, obesity figures have steadily increased.

SPOTLIGHT ON MEXICO

As we have already seen, the most optimistic claim for Mexico's new sugary drink tax is that per capita soda consumption has fallen 7.6% during the first two years of the tax. Setting aside debate over the reliability of this evidence, is this a significant amount? On a per person basis, a 7.6% decline works out to 13.9 mL less soda per day. This is slightly under one tablespoon; or one tiny sip from a standard 330 mL pop can. Such a miniscule amount (approximately six calories per day) is unlikely to have any noticeable impact on BMI statistics. In fact, evidence reveals BMI rose in the year following the tax. According to the NCD Risk Factor Collaboration website, mean male BMI in Mexico increased from 27.39 to 27.47 during 2014. Women showed an even larger increase. This despite advocates' claims that the tax would yield an immediate two to four pounds reduction in mean weight across the population.³⁰

SPOTLIGHT ON FRANCE

The French soda tax, enacted in 2012 reduced soft drink consumption by an estimated 3 to 3.5 litres per person annually.³¹ While this may seem a significant amount, it translates to less than 10 mL per day per person. An even smaller sip. Since 2011, rates of obesity have risen for French men and stabilized for French women.

²⁵ Finkelstein, Eric et al. "[Implications of a sugar-sweetened beverage \(SSB\) tax when substitutions to non-beverage items are considered](#)," in *Journal of Health Economics* Vol. 32 issue 1 January 2013

²⁶ Grogger, Jeffrey. "[Soda Taxes and the Prices of Sodas and Other Drinks: Evidence from Mexico](#)." Institute for the Study of Labour. IZA Discussion Paper No. 9682 January 2016.

²⁷ Wright, Alexandra et al. "[Policy lessons from health taxes: a systematic review of empirical studies](#)," in *BMC Public Health*. June 19, 2017

²⁸ Body Mass Index (BMI) is calculated as a person's weight in kilograms divided by their height in metres squared. A BMI of between 18.5 and 25 is considered to be normal, or ideal. Between 25 and 30 is classified as overweight. Above 30 is obese.

²⁹ NCD Risk Factor Collaboration. See www.ncdrisc.org/data-downloads-adiposity.html

³⁰ Grogger, 2016

³¹ Ecorys, 2014



SPOTLIGHT ON USA

Using the vast data set available in the U.S. given its many decades of experience with state-level soda taxes and obesity data, researchers at the Evans School of Public Affairs at the University of Washington studied the impact of taxes on obesity and found “no relationship between soda taxes and BMI.”³² In some instances, BMI rose as soda taxes were introduced, suggesting BMI and soda consumption move completely independently of one another. The conclusion: “Our research does not support the theory that soda taxes have a negative effect on body-mass index.” BMI figures have risen substantially for both men and women in the U.S.



SPOTLIGHT ON CANADA

According to 2017 research by the University of Waterloo’s School of Public Health and Health Systems, a 20% tax on sugary drinks of all kinds (which includes soda, flavoured milk, energy drinks and 100% fruit juice) would cause large and measurable improvements in Canadian health and weight.³³ The study, funded by the Heart & Stroke Foundation, claims that over the next 25 years, a sugary drink tax would save the lives of 13,000 Canadians as well as prevent 200,000 cases of diabetes, 60,000 cases of ischemic heart disease, 20,000 cases of cancer and 8,000 strokes. Canadian BMI is predicted to drop by 0.43 for men and 0.34 for women. It is a very specific and comprehensive list of health benefits. The report claims all this is made possible by a soda tax that will reduce daily beverage consumption by 25 calories per day. Do these claims hold up to scrutiny?

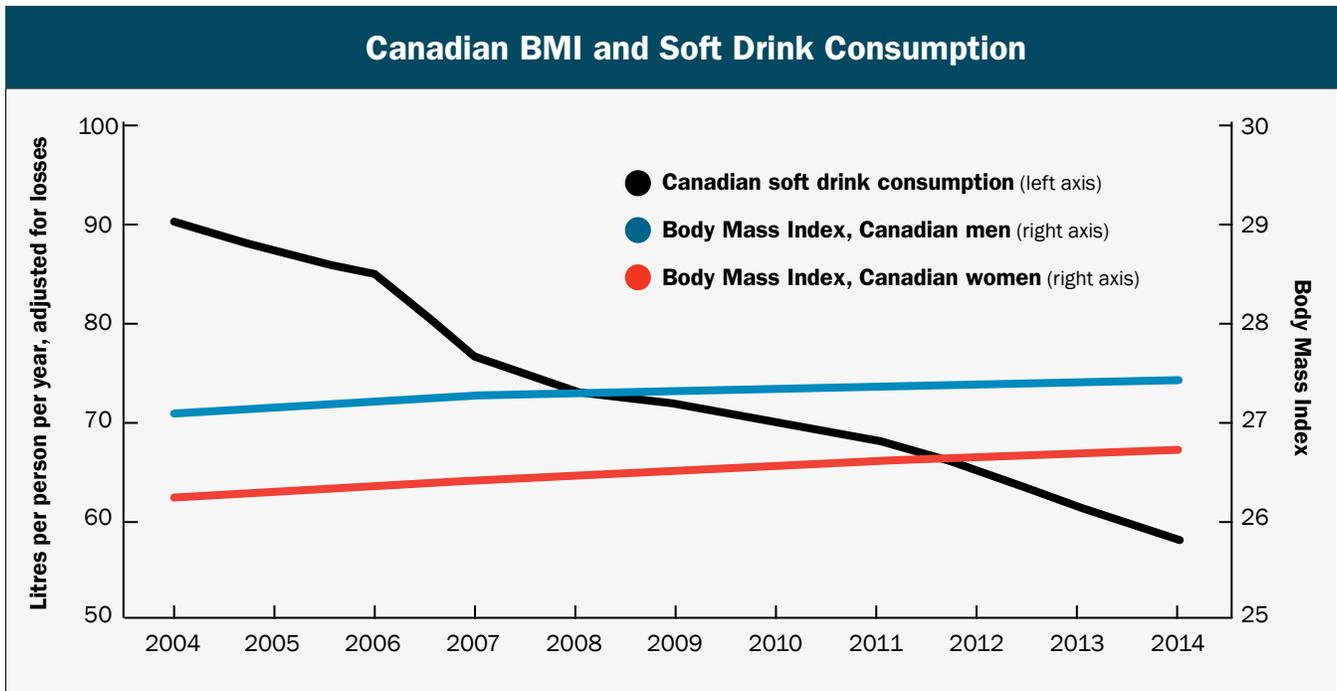
As a result of changing tastes, Canadians have already been reducing their consumption of soft drinks over the past decade. Between 2004 and 2015, for example, per capita soft drink sales have fallen by 27%. In total, sugary drink consumption is down about 12%. This works out to a daily net reduction of approximately 28 calories. This country, in other words, has already experienced a bigger drop in actual beverage calorie consumption than is predicted to occur due to the proposed tax. And what has happened to Canada’s BMI over this time? It has continued its upward trajectory. Adult male BMI has risen 0.34 points since 2004 – from 27.08 to 27.42; adult female BMI is up 0.47 points – from 26.22 to 26.69. This evidence contradicts claims made by the University of Waterloo study that a reduction in soda consumption will inevitably cause a decline in BMI. Canadians are already drinking less soda, but BMI and obesity indicators are still rising. Given these facts, there is no reason to believe a sugary drink tax will work as advertised.

³² Fitts, Dani and Amelia Vader. “[The Effect of State Level Soda Tax on Adult Obesity](#).” Evans School Review. Vol.3. No. 1 Spring 2013

³³ Jones, 2017

Results showing no impact of taxes on body weight are not exclusive to our focus countries. In Britain, where a soda tax has been proposed for 2018, an Oxford Economics study predicts the overall caloric intake of citizens following the tax will drop a mere five calories per day, equivalent to 0.2% of recommended daily calorie intake.³⁴ Any decline in soda consumption is likely to be accompanied by an almost equivalent increase in milk and juice consumption. Curiously, the British plan excludes many highly-sugary beverages (including milk shakes) from the tax because of concerns young girls in particular are not getting sufficient calcium. Such convolutions point to the problems inherent in trying to manipulate the public diet via fiscal measures.

In summary, ample evidence from around the world shows food and drink taxes have had no or negligible impact on obesity in countries that have adopted such policies. Despite recent enthusiasm for food and drink taxes among public health campaigners and politicians, the vast preponderance of evidence weighs against their usefulness as a tool to combat obesity. This is because consumer decisions are influenced by a wide variety of behavioural, societal, geographic and biological factors – many of which are completely independent of tax policy. In fact, there appears to be no link whatsoever between soda consumption and obesity. While soft drink demand has been falling for a decade in Canada, obesity rates continue to rise. And if this is the case, why would a soda tax make any difference?



Source: NCD Risk Factor Collaboration country data for adiposity, www.ncdiisc.org
 Statistics Canada, "Food available in Canada" Table 002-0011

³⁴ Oxford Economics, "The Economic Impact of the Soft Drinks Levy: Final Report." August 2016

PART FOUR:

OTHER METHODS OF EVALUATING FOOD AND DRINK TAXES

Beyond our investigation of the four tax conditions required for food and drink taxes to have an impact on obesity rates, other observers have examined the effectiveness of food and drink taxes using different measures or standards. Here is a sampling of other perspectives on the appropriateness or effectiveness of using food and drink taxes to influence obesity.

Efficient tax policy

A recent paper from the U.S.-based Tax Policy Center (a joint initiative of the Urban Institute and Brookings Institution) considers the issue of taxing soda from the perspective of good tax design. The report points out that taxes are appropriate policy instruments when there is a “tight relationship between the product or activity that gets taxed and the negative effect they cause.” While many food tax advocates cite the experience of tobacco taxes in supporting claims for a fiscal-based diet, this argument is undermined by the complexity of obesity as well as the lack of a dose-response mechanism. While every cigarette is an obvious health risk, the same is not true for every can of soda or doughnut. The vast majority of the population can enjoy the occasional sweet indulgence without any negative health impacts or increasing their risk of obesity. In fact, calories in all forms are a necessary component of a healthy diet. “This imperfect linkage between dose and response ... is an important limitation” on food and drink taxes, according to the Tax Policy Center.³⁵

Effective policy intervention

In a comprehensive survey of potential policy tools to combat rising rates of obesity, consulting firm McKinsey & Company considered 74 possible public policy interventions.³⁶ They

narrowed this down to 44 specific measures in 16 different categories using various screens such as cost-effectiveness, scope of improvement to be expected and quality of the available evidence. Under this rigorous assessment process the use of taxes – specifically a 10% tax on soda – was ranked 13th out of 16. Food taxes were assigned the lowest possible rating for strength of evidence given “no direct evidence for change in weight or change in consumption or physical activity levels.” McKinsey considered changes to portion size, education campaigns and efforts by manufacturers to reformulate their products to reduce sugar, fat and salt content as far more promising opportunities for combating obesity.

List of 16 Evaluated Interventions Ranked by Cost-Effectiveness and Impact from McKinsey Report

1. Portion control
2. Reformulation
3. High calorie food availability
4. Weight management programs
5. Parental education
6. School curriculum
7. Healthy meal provision
8. Surgery
9. Labelling
10. Price promotions
11. Pharmaceuticals
12. Media restrictions
13. 10% tax on high sugar products
14. Workplace wellness programs
15. Active transport
16. Public health campaigns

³⁵ Marron, Donald et al. “[Should we tax unhealthy foods and drinks?](#)” Tax Policy Center. December 2015

³⁶ McKinsey Global Institute. “[Overcoming Obesity: An initial economic analysis.](#)” November 2014

Effective diet control

Another comprehensive approach to assessing soda tax effectiveness involves a meta-analysis of 880 separate academic journal articles on the topic.³⁷ The authors, from the Behaviour and Health Research Unit at the University of Cambridge, found this vast data set yielded no consistent evidence in favour of taxation as a useful method for controlling diet. They stressed “a need for caution in developing policy based on limited evidence and overly simple assumptions about how people will respond to changes in prices.” The researchers also took issue with “overly optimistic claims made by some authors ... for the use of economic instruments to improve population health behaviour.” The case for food and drink taxes, the authors concluded, is “less compelling than some proponents have claimed.” Certainly not a ringing endorsement, despite what advocates may claim.

³⁷ Shemilt, Ian et al. “[Economic Instruments for Population Diet and Physical Activity Behaviour Change: A Systematic Scoping Review.](#)” in PLOS One. Volume 8, Issue 9 September 2013

PART FIVE: BROADER IMPLICATIONS OF FOOD AND DRINK TAXES

While food and drink taxes have no proven link to reductions in obesity or other health measures, and fail on the basis of numerous public policy criteria, they can have real and substantial effects in other ways. Below is a summary of some important arguments against soda taxes distinct from their inability to affect obesity rates.

Food and drink taxes are regressive

The burden of new food and drink taxes is not shared evenly across society. Households in lower socio-economic brackets spend a greater proportion of their income on food and drink than households in higher brackets. Low-income groups also tend to consume proportionately more food and drink targeted by taxes. As a result, any measure designed to raise the price of soda or other high-calorie food or drink will tend to be regressive – hitting poorer families harder than richer ones. A Tax Policy Center study on the impact of a U.S.-wide penny per ounce soda tax finds that the additional average tax rate burden on the bottom fifth of the income distribution would be nearly five times greater (0.19% vs. 0.04%) than the burden on the top income bracket.³⁸

Sometimes the regressive nature of food and drink taxes is promoted as a virtue. Because diets are often poorer among lower socio-economic segments, taxes that hit these groups harder will have the effect of encouraging a greater response. This argument has often been made in favour of the Mexican soda tax.³⁹ It seems an extremely punitive approach to take with public policy, and fraught with ethical conflicts. Why should the poor be made to suffer more than the rich from any new tax?

Attempts to control personal food choices through prices are unpopular and unfair

The unpopularity of the fat tax in Denmark should be considered a landmark event in a country that has long accepted very high levels of taxation. It also points to widespread public dissatisfaction at government efforts to control the diet and personal choices of citizens. The experience in American cities experimenting with soda taxes and other measures further reveals this to be an extremely contentious topic which often leads to divisive politics and lengthy court challenges.⁴⁰ In Canada, polling shows that nearly two thirds of Canadians do not believe it is the proper role for government to tax some foods and not others.⁴¹

Public dissatisfaction with new food and drink taxes has become more obvious as such proposals proliferate at the municipal level, particularly in the U.S. While several cities have recently adopted a soda tax, including Seattle, Philadelphia, San Francisco and Boulder, CO, many others have rejected the notion outright. A city-wide referendum in Santa Fe, NM in May 2017 voted down a proposed US2¢/ounce soda tax by a 60/40 margin.⁴² And in Chicago, a US1¢/ounce tax was imposed in August 2017 but repealed just a few weeks later due to a massive public outcry; opinion polls showed nearly 90% of voters disapproved of the measure.⁴³ Recently the state of Michigan passed legislation forbidding its municipalities from enacting soda or other food taxes.⁴⁴

³⁸. Marron et al. 2015

³⁹. Colchero, 2017

⁴⁰. Dardick, Hal and John Byrne. "[Vote to repeal Cook County soda tax delayed a month, as ad campaigns continue](#)," in *Chicago Tribune*. September 14, 2017.

⁴¹. Taylor, Peter Shawn. "[Tax on the Menu: Why taxing food and drink won't make Canadians thinner. But will make their governments much, much fatter](#)." Canadian Taxpayers Federation. November 13, 2013

⁴². Lee, Morgan. "[Santa Fe Voters Reject Soda Tax, Hand Rare Win to Industry](#)" *U.S. News and World Report*, May 3, 2017

⁴³. The Economist. "[Chicago's soda tax is repealed](#)." October 13, 2017.

⁴⁴. Gray, Kathleen. "[Michigan Senate says no to local taxes on pop, food, chewing gum](#)." *Detroit Free Press*, Oct. 4, 2017

Part of the reason for the rejection of food and drink taxes is their unfairness. Such taxes are a blunt tool that cannot discriminate between individuals who are obese and/or who may face health issues, and those who are not. A tax applied to Gatorade or other sports drinks, for example, will force healthy individuals consuming these products as part of their active lifestyle to pay extra for this privilege. Punishing healthy citizens with these sorts of taxes is obviously unfair.

Food and drink taxes provide a lucrative, and illegitimate, new source of government revenue

Regardless of their effect on obesity rates, soda taxes have proven to be an extremely effective method of raising government revenue. Mexico, for example, initially budgeted for \$1 billion in revenue the first year of its soda tax; the actual government take was \$1.5 billion. The following year revenue again outpaced expectations by a substantial margin. The fact revenues continue to outstrip predictions can be seen as further proof of soda's inelastic demand in Mexico. And a worrisome indicator of how they may become a favoured new tool for increasing government revenue. Ahead of a planned soda tax in 2018 in Britain, consulting firm Oxford Economics predicts a windfall of nearly \$700 million to the British government.⁴⁵

In Canada, a 20% excise tax applied to all sugary beverages, including 100% fruit juice, is estimated to be worth \$1.7 billion per year in additional federal tax revenue.⁴⁶ Tax advocates typically argue this money should be put towards various new public health expenditures. But, as has been shown above, food and drink taxes do not produce the desired objectives of reducing obesity or lowering national BMI figures. Applying new taxes to basic household necessities such as food and drink should be considered a violation of the standard measures of good tax policy: equity, efficiency and necessity. Food and drink taxes meet none of these criteria.

Food and drink are already taxed in Canada

In advance of the planned soda tax in the Northwest Territories, it should also be noted that Canadians already pay extra taxes on purchases of soft drinks and other snack foods. According to a recent federal Department of Finance memo:

“The tax system already provides for a disincentive to purchase sugar-sweetened beverages through the broad application of the GST/HST. While basic groceries, including fruits and vegetables, eggs and most milk products as well as fresh meat, poultry and fish are not subject to GST/HST, products such as soft drinks, confections and snack foods are not considered basic groceries and are therefore subject to the GST/HST.⁴⁷”

Canadian soft drinks purchasers must pay the current 5% HST tax rate, plus applicable provincial sales taxes that can be as high as 10%. Soda is thus already taxed in Canada at a rate as high as 15%.

Food and drink taxes arbitrarily punish businesses

The creation of new food taxes often places arbitrary and unfair burdens on businesses. This situation is most clearly illustrated by the recent experience in Philadelphia.

Philadelphia has had a US1.5¢/ounce tax on sugary and diet sodas since January 2017. After twice failing to win support for such a tax on the strength of obesity arguments, proponents switched to claiming the tax was necessary to fund pre-kindergarten education. This proved sufficient to win city council approval. However, the tax is only levied within the city limits of Philadelphia, and not the broader metropolitan area. As a result, the tax has had a significant impact on how and where Philadelphians buy their groceries.

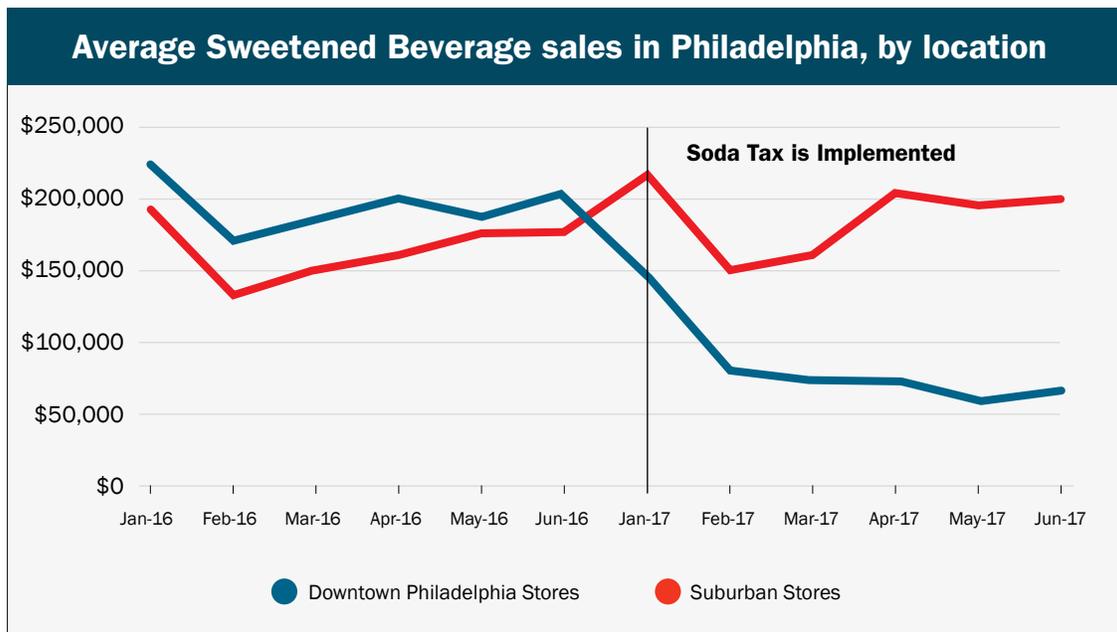
⁴⁵ Oxford Economics, 2016

⁴⁶ Jones et al, 2017

⁴⁷ Department of Finance Canada “Analysis of Issues related to a Potential Tax on Soft Drinks,” Memo to the Minister or Minister’s Staff, January 29, 2016. Obtained through Access to Information.

According to statistics compiled by Philadelphia’s City Controller, who acts as a civic fiscal watchdog, prior to the tax the average urban Philadelphia grocery store earned US\$330,000 in total more than its suburban peer.⁴⁸ After the tax, these stores earned nearly US\$200,000 less, on average. Per store sales of the two largest grocery store chains within city boundaries fell by 13% in the first six months of the tax. Sales at suburban stores rose over the same time. This dramatic turnaround was the result of consumers choosing to shop outside city limits to take advantage of cheaper soda prices. Urban grocery stores saw sweetened beverage sales fall by 57% in the first half of 2017. In contrast, suburban stores saw their sweetened beverage sales rise by 14%. Such a dramatic swing in grocery store sales is clearly a perversion of good public policy. Government policy should never intervene in the private sector in such an obvious and detrimental fashion. The huge fall in sales also resulted in soda tax revenues failing to meet projections by US\$7 million, causing the city’s promised pre-kindergarten system to be underfunded.⁴⁹

While the Philadelphia experience highlights the dramatic impact food taxes can have on business profitability, it is certainly not the only example. The Ecorys report for the European Commission concludes that the “introduction of food taxes increases costs for the firm, most notably administrative costs.”⁵⁰ The Danish fat tax was also singled out for its excessive administrative burden.⁵¹ Such threats to profitability are typically more of a concern for small and medium-sized firms, which tend to be less able to survive such problems than larger, multi-national corporations. In this way, food and drink taxes may benefit big firms at the expense of smaller ones. For Britain, the Oxford Economics report estimates 4,000 jobs will be lost a result of the planned soda tax, and GDP lowered by over \$200 million.⁵²



Source: www.philadelphiacontroller.org/publications/SodaTax_SalesImpact_September2017.pdf

⁴⁸ Butkovitz, Alan. “Impact of the Beverage Tax on Philadelphia’s Grocery Stores,” Office of the City Controller, City of Philadelphia. September 18, 2017.

⁴⁹ Drenkard, Scott and Courtney Shupert. “Soda Tax Experiment Failing in Philadelphia Amid Consumer Angst and Revenue Shortfalls.” Tax Foundation, August 2017.

⁵⁰ Ecorys, 2014

⁵¹ Snowden, 2013

⁵² Oxford Economics, 2016

Food and drink taxes can create further unintended negative consequences

Beyond its impact on individual grocery store profitability, Philadelphia's soda tax also threatens broader damage to food accessibility within city limits, with unpleasantly regressive consequences. Urban grocery stores play a major role in making nutritious food conveniently available in low-income urban neighbourhoods. However, the soft drink tax's impact on these stores' profitability seriously threatens this role. According to the Philadelphia City Controller's report on the soda tax, "the tax could pose a real threat to the viability of grocery stores ... which play a vital role in the provision of healthy, fresh foods in underserved neighborhoods."⁵³ While wealthier residents can easily shop at far-flung suburban stores, low-income urban residents often lack access to transportation necessary to take advantage of these opportunities. The closing of downtown grocery stores could thus have a devastating effect on provision of good quality food in poorer areas. In this way, a soda tax imposed for public health reasons could lead to a dramatic reduction in the ability of low-income Philadelphians to access nutritious food. It is an entirely perverse outcome.

Food subsidies fail just as often as food and drink taxes

Given the obvious failures of food and drink taxes to affect calories consumed or obesity rates, some public health campaigners and media outlets have taken to advocating for subsidies on healthy food products instead of taxes on supposedly unhealthy items.⁵⁴ While this topic is worthy of its own investigation, it is sufficient to observe here that such policies are equally problematic. In a laboratory-type experiment, researchers at the University of Buffalo observed the reaction of female shoppers to being provided with subsidies on healthy, low-calorie products.⁵⁵ Rather than increasing consumption of healthy products in the place of unhealthy goods, the consumers spent "the money saved on healthier foods on additional purchases of less healthy alternatives." The researchers concluded: "These results suggest that a subsidy on healthy foods is unlikely to positively influence rates of obesity."

⁵³ Butkovitz, 2017

⁵⁴ The Globe and Mail editorial board. "[How to get people to eat their veggies](#)," The Globe and Mail, August 6, 2017

⁵⁵ Epstein, Leonard K. et al. "[The Influence of Taxes and Subsidies on Energy Purchased in an Experimental Purchasing Study](#)," in *Psychological Science* Vol. 21, Issue 3 February 2010

CONCLUSION

Given the sudden popularity and rapid spread of food and drink taxes among governments around the world, an obvious question bears asking: Are they successful? The answer: It depends on how success is defined.

Any food and drink tax will almost certainly raise the price of the taxed items. Whether this price increase is equivalent to the size of the tax depends on several factors, but it is reasonable to assume a soda tax, for example, will make soda more expensive. It will also create more tax revenue for government. Beyond these two certainties, however, the preponderance of international evidence shows food and drink taxes ultimately have no bearing on weight loss or obesity rates.

How much less of a product consumers chose to buy after a tax is imposed depends on the elasticity of demand. According to experience in Europe and Mexico, consumers tend to reduce purchases by substantially less than the amount of the tax. This suggests demand is inelastic, which undermines efforts to control the public diet by fiscal means. Consumers, in effect, resist the full force of the tax.

Other factors also push against the intended purpose of food and drink taxes, which is to reduce the total amount of calories consumed so as to reduce obesity. The human body's dynamic metabolic adjustment, for example, fights against externally-imposed reductions in calories, muting the effect of a tax on body weight. Similarly, consumers faced with food and drink taxes habitually make substitutions in order to maintain constant caloric intake. This may include switching to untaxed products (such as juice or chocolate milk instead of cola), purchasing cheaper brands, shopping at discount stores or engaging in cross-border shopping. All of these activities will mitigate the proposed effect of a food or drink tax.

The ultimate measure of success for a tax meant to reduce obesity is, of course, whether such taxes lead to an observable decline in obesity. Here the evidence is incontrovertible. Several years after the imposition of food and drink taxes explicitly meant to reduce obesity, there is no proof they are working. Obesity rates continue to rise despite higher prices for soda in many countries.

Canada provides a very useful counterfactual to claims a reduction in soda consumption will reduce obesity. Between 2004 and 2015 Canadian sugary drink demand fell by 12% due to changing habits and consumer preferences. On a per capita basis, this is a reduction of approximately 28 calories a day – greater than the predicted 25 calories per day decline from a proposed 20% tax on sugary drinks over the next 25 years. While tax proponents claim their proposal will yield an unambiguous decline in BMI of 0.43 points for men and 0.36 points for women, real-world evidence reveals the exact opposite effect. Between 2004 and 2014 (the latest figures available), while soda consumption fell substantially, the BMI of Canadian men increased by 0.34 points and by 0.47 points for Canadian women.

Soft drink consumption has fallen significantly in Canada without any tax being imposed. And during this time BMI and obesity rates have steadily increased. Why would anyone expect a different result with a tax? Clearly sugary beverage consumption is not a reliable or scientific indicator of obesity trends.

The only measurable success achieved by soda taxes is in raising new government revenue. Revenue from Mexico's 2014 soda tax have consistently outstripped expectations. In Canada, a 20% tax on sugary drinks is estimated to earn

Ottawa \$1.7 billion a year, although this may be a substantial underestimate given Mexican experience. While public health campaigners argue the size of this windfall is a substantial benefit, the mere fact that a food and drink tax will bring in new revenue is not an argument in its favour. New tax measures must always be weighed against the necessary public policy criteria of equity, efficiency and necessity. Taxing food and drink meets none of these standards.

Recent experience in Philadelphia provides a further warning about the unintended consequences of ill-conceived food and drink taxes. This US1.5¢/ounce soda tax has dramatically reduced the profitability of large, urban grocery stores in Philadelphia as consumers now choose to do their grocery shopping outside city limits to take advantage of cheaper soda. Beyond arbitrarily threatening the viability of downtown grocery stores, the tax could also reduce the availability of nutritious food in core areas of Philadelphia where low-income residents often lack the ability to travel outside city limits to shop.

The fate of Chicago's recent soda tax is similarly instructive. Barely a month after imposing the US1¢/ounce tax on sugar-sweetened beverages, the impost was repealed because of a loud and angry outcry from the citizenry: nearly 90 percent of Cook County residents said they opposed the measure. As in Denmark, there is scant public support for taxes that deliberately seek to make food and drink more expensive.

Finally, we need to acknowledge that weight loss and obesity are very complicated issues involving a web of biological, societal, geographic and consumer demand factors. Taxing food and drink is a naïve and simplistic solution to a complex problem. And the real-world evidence shows it doesn't work.