Mexican Sugar Tax – Evidence of Impact

To: Hon Jonathan Coleman, Minister of Health

Purpose

You have asked for further advice on the imposition of a sugar tax in Mexico and, in particular, the evidence around its impact.

Key points

- While a sugar tax has potential to contribute to addressing obesity, there is only limited evidence on the effectiveness and impact of such taxes.
- The Mexican tax was only introduced in 2014 – there is very little information available on its impact other than some preliminary price and sales data.
- Preliminary data shows that introduction of the tax was followed by a 12 percent decline in the sales of sugar-sweetened beverages after a year. However, it is not yet clear whether this is attributable to the tax, has been sustained, or is associated with an overall reduction in the consumption of sugar or energy. In this regard:
  - The tax has only been in place for a short period of time, and robust evaluative information on whether there has been an impact on sugar consumption, sustained or otherwise, is not yet available.
  - The information currently available is narrow – it refers only to short-term changes in sales, does not show causality, and does not look at total sugar consumption, energy intake or obesity.
  - Work needed to assess the impact of the tax is being undertaken, but not yet completed.
- Work to assess the impact of the tax needs to look at more than just changes in the sale of taxed products – it also needs to thoroughly assess and take account of other factors that might also have an impact on consumption, such as substitution, cross-border shopping, short-term anomalies (eg, the weather), and the availability of safe drinking water. It also needs to look at whether any impact found was temporary or sustained over time.
- Until robust evaluative work has been completed, it is not possible to draw reliable conclusions about the impact of the tax on the consumption of sugar-sweetened drinks, energy intake or obesity.
- New Zealand work led by Professor Gibson at the University of Waikato is looking at the impact of taxes to raise the prices of unhealthy foods – using data from Mexico, as well as Indonesia and Vietnam. This is expected to be completed by 1 May 2018.

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Recommendations
This report responds to your request for further information, and does not make any recommendations.

Teresa Wall
Acting Deputy Director-General
Policy Business Unit

Minister's signature
Date:
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Background

1. On 12 June 2015 we provided you with a preliminary advice on sugar taxes (HR20150881 refers). You have requested further advice on available evidence on the impact of recent tax on sugar-sweetened beverages that was introduced in Mexico.

The Mexican Tax

What is it?

2. On 1 July 2014 Mexico introduced a specific excise tax of one peso per-litre\(^1\) tax on carbonated drinks ("sodas") and other sugary drinks, excluding alcoholic drinks.

What is the rationale?

3. Taxes of this type are usually described as “sin taxes” – and are levied on products or services that are socially costly, with the objective of adding to their price to discourage consumption without making those products and services illegal. Frequently, raising revenue is also an objective although, paradoxically, raising a large amount of revenue can indicate that a sin tax is failing in its objective of reducing consumption. The rationale for a sugar tax is straightforward – by raising the price of sugar-sweetened drinks the quantity consumed should fall, and there should be substitution away from the taxed products to healthier untaxed alternatives.

4. In practice, the extent of this impact will depend on the design and level of the tax, the responsiveness of demand for the product to price changes, the types of substitutes available, and institutional factors such as the way the tax is implemented and the ease of bypassing the tax (eg, through cross-border shopping).

5. A well designed sin tax should, among other things, have the following characteristics:

   - **Have the desired behavioural impact.** It should lead to a meaningful sustained reduction in social cost of the product or service in question by reducing the volume consumed. In the case of a sugar tax, this includes not having the impact largely or wholly offset by substitution away from the taxed products to equally energy-dense and unhealthy alternatives.

   - **Be difficult to evade.** A tax that is easily avoidable will not have the desired impact, and will likely require significant ongoing resources being allocated to detecting and preventing avoidance.

   - **Be simple.** It should be designed in a way that makes it simple for those liable to pay the tax, and those tasked with enforcing the tax, to understand and calculate what has to be paid. It should not require ongoing amendment and litigation because unclear design creates boundary issues and unintended loopholes.

   - **Be efficient and proportionate.** It should be easy and cost-effective to administer, and balance the benefits of the desired behavioural change against the impact of the tax on households. In this regard, virtually all indirect taxes are regressive, with a higher proportionate financial impact on low-income people.

   - **Be free of unintended consequences.** The purpose of a sin tax is to drive behavioural change. However, there is always a risk that as well as the intended behaviour change there may be unintended behaviour changes as well. For example if, if people substituted from the taxed product to healthier alternatives (eg, water) then the objective of the tax would be achieved. However, if they instead substitute less healthy alternatives (eg, high-sugar flavoured milk, cheaper generic sugar-sweetened beverages or beer) then the health gains might not occur, and health outcomes might even worsen.

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\(^1\) Approximately 9.3\(\_\)\(\_\) NZ at current exchange rates, and roughly corresponding to a 9 percent price rise.
What evidence could we locate?

6. The Mexican tax has received considerable media attention, and is being cited by commentators as an example of how such a tax can reduce consumption of sugar-sweetened beverages and, consequently, obesity.

7. We have conducted a search for economic papers that address the impact or potential impact of the Mexican tax. We found only two published economic papers in English:
   - A working paper published by the National Bureau of Economic Research (NBER)\(^2\) that investigates price changes after the introduction of the tax.
   - A poorly translated paper originally written in Spanish published by the *Instituto Nacional de Salud Pública* (Mexico's National Institute of Public Health), that investigates price elasticities based on data from a household survey conducted before the tax was introduced.

8. We also found:
   - A number of Spanish language papers for which no English translation was available.
   - A brief summary of some preliminary findings from work being jointly conducted by the University of North Carolina and Mexico's National Institute of Public Health.

9. We identified no published papers in peer-reviewed economics journals.

National Bureau of Economic Research

10. The NBER paper was published in May 2015 and analyses the impact of Mexico's tax on the price of sugar-sweetened drinks and some non-sugar-sweetened drinks. The analysis is based on 15 months of data since the introduction of the tax and only describes the impact on prices. The results indicate that:
   - The price of sugar-sweetened sodas increased by more than the tax (12% price rise, 9% tax) which is consistent with a less competitive market, such as Mexico's soda market. The price rise occurred as the tax took effect, suggesting that it may be directly attributable to the tax.
   - The price of other sugar-sweetened drinks (for which Mexico has a somewhat more competitive market than for sodas), increased by less than the tax and may have fallen again by the end of the sample period.
   - An increase in the price of diet sodas also occurred after the introduction of the tax, which may indicate some substitution (i.e., a rise in demand as people substitute away from the taxed nondiet alternatives).
   - No economically significant change occurred in the prices of water and milk. An increase in the prices of water and milk may have indicated some substitution.
   - A rise in the price of pure juice occurred after the introduction of the tax, which may indicate some substitution, but the effect was not sustained.

11. However, this analysis did not take account of non-economic factors that could change demand and prices, such as health promotion, increased awareness, and the increased availability of safe drinking water. This means that it is difficult to be confident about the extent to which price changes were due solely to the tax.

12. The study did not look at whether observed price changes had any impact on consumption of sugar-sweetened drinks, energy intake, or obesity.

Mexican National Institute of Public Health

13. This 2013 study³ by Mexico’s National Institute of Public Health looked at the demand for soft drinks in Mexico prior to the tax.

14. The overall conclusion of the study appears to be that consumers of soft drinks were fairly unresponsive to price changes. The study concludes that a 10% tax on soft drinks will lead to a maximum of 38ml (15 calorie) per day reduction in consumption of these drinks. Furthermore, this result was associated only with consumers who are the most responsive to price changes. The study provides no evidence of an impact on overall caloric intake or obesity.

15. A shortcoming of the study was the interpretation of the economic model, which is flawed in failing to correctly identify price elasticity of demand. The overall effect of this error is small but illustrates how easily economic models can be misused and calls into question the overall credibility of the study.

16. Another shortcoming of the study is the definition of soft drinks, which included sugar-sweetened as well as ‘diet’ varieties. This could be significant as elasticities of goods that are likely to be seen as substitutes may be different when calculated separately.

17. The report raises an important issue regarding access to safe drinking water. Consumers living in areas without universal drinking water were found to be far more likely to consume soft drinks. At the time of publication the availability of safe drinking water had been increasing, raising a question about whether people were simply switching to water because of greater access.

University of North Carolina & Mexican National Institute of Public Health

18. This study has not yet been completed. However, a short English summary of some preliminary findings⁴ has been made available, and states that the tax is associated with:

- A fall in consumption of the taxed beverages by an average of 6% over 2014, with the amount of reduction reaching 12% by December 2014.
- An even larger impact for lower socioeconomic groups, with an average reduction of 9% over 2014, reaching 17% by December 2014.

19. However, these findings need to be interpreted with caution. They are based on limited data and are preliminary only – the actual study has not yet been completed or peer-reviewed (we understand that this is planned, but have not been able to determine the expected completion date). Moreover, these findings do not make any claims about an impact on energy intake or obesity and it is unclear to what extent, if any, the work takes account of factors such as substitution.

Other Information

20. We understand that in the same period within which the tax took effect the Mexican Government initiated a $US 31.9 billion investment programme to improve water infrastructure to guarantee 100% access to safe drinking water by 2018. The effect of increased access to safe drinking water is likely to reduce consumption of sugar-sweetened drinks in Mexico, irrespective of tax changes. As noted above, consumers living in areas where access to safe drinking water is not universal were found to be far more likely to consume soft drinks. Empirical work on the impact of the tax will also take account of this.

21. In October 2014 Coca Cola reported that its sales in Mexico had declined in the first half of 2014⁵, following introduction of the tax. However, Coca Cola attributed much of the decline poor weather and a weak economy in that period, and also stated that their sales decline was waning by the third quarter of 2014.


⁴ http://www.insp.mx/epppo/blog/3659-reduccion-consumo-bebidas.html

New Zealand Work

22. In addition to the work in other countries, there is also work underway in New Zealand on the effectiveness of such taxes. A University of Waikato team led by Professor John Gibson\(^6\) has received a grant from the Marsden Fund to look at the impact of using taxes to raise the prices of unhealthy foods. This will involve several studies analysing data from Indonesia, Mexico and Vietnam. We understand that this is scheduled to be completed by 1 May 2018.

Comment

Impact of the Mexican Tax

23. To be useful an evaluation needs to be based on good data over a sufficiently long time period, to distinguish between correlation and causation, establish whether any impacts are sustained, and take account of other factors that might impact on sugar consumption – such as substitution, and increasing availability of safe drinking water.

24. It is not yet possible to draw firm conclusions about the impact of the Mexican tax on sugar consumption and obesity. The tax has only been in place for a comparatively short period of time, and we have not been able to locate any full evaluations of its impact. Media commentary to date appears attributable to sales results reported by companies, and the preliminary findings of the University of North Carolina & Mexican National Institute of Public Health study.

25. The limited information currently available suggests that sugar-sweetened beverage consumption may have fallen after the introduction of the tax. However, the extent to which this occurred and whether this is wholly or partly attributable to the tax is not yet clear.

Role of a Sugar Tax in Addressing Obesity

26. As we have previously advised, a tax levied on sugars or specified products containing sugars potentially has a role in reducing sugar consumption, energy intake and obesity. We expect that a properly designed sugar tax would have an impact on sugar consumption. In this regard:

- While the international evidence on the effectiveness and impact of such taxes is currently very limited, a number of countries have recently introduced such taxes and evaluative work is being undertaken – both in New Zealand and overseas. We expect that this will improve our understanding on the impact and effectiveness of sugar taxes, including the size of the tax needed to have an impact and the design features that do and don’t work well.

- We will be taking a particular interest in the work being done at Waikato University, and the evaluation of the Mexican tax being jointly undertaken by the University of North Carolina and the Mexican Institute of Public Health.

- There are difficult and detailed design issues that would need to be carefully worked through before any decision to introduce a sugar tax is made – such as coverage, rate, exemptions, implementation, compliance costs and enforcement. This work is essential to ensure such a tax is as effective as possible, and does not result in material unintended consequences.

END.