

## **Twenty percent tax on fizzy drinks could save lives and generate millions in revenue for health programmes in New Zealand**

High sugar intakes are linked to obesity,<sup>1</sup> type 2 diabetes and cardiovascular disease;<sup>2,3</sup> a strong case can, therefore, be made for efforts to reduce consumption. There is particular concern about sugar-sweetened beverages because they are nutrient poor, and energy from beverages is less satiating than that obtained from solid foods, resulting in increased consumption.

Almost one-fifth of the total sugar intake of New Zealand adults (17%) comes from non-alcoholic beverages.<sup>4</sup> Younger people in particular derive a substantial proportion of their sugar intake from non-alcoholic beverages; 27–29% of total sugar consumed by 15–18 year olds comes from these drinks versus 7–8% in those aged 71+ years.<sup>4</sup> Younger children (5–14 years) obtain nearly a quarter (24%) of their daily sugar intake from beverages.<sup>5</sup> Randomised controlled trial data have shown convincingly that consumption of sugar-sweetened beverages leads to weight gain in children.<sup>6</sup>

Taxation has been proposed to reduce sweetened drink consumption and counteract obesity,<sup>7</sup> and a number of countries have implemented taxes on soft drinks or sugar-sweetened beverages.<sup>8</sup>

Research published recently in the *British Medical Journal (BMJ)* reported that a 20% sales tax on sugar-sweetened drinks could reduce the prevalence of obesity in the UK by 1.3% (around 180,000 people) and reduce the prevalence of overweight by a further 0.9% (285,000).<sup>9</sup> A health impact assessment of a proposed 10% tax on sugar-sweetened beverages in Ireland found it could reduce prevalence of obesity by 1.3% and prevalence of overweight by a further 0.7%.<sup>10</sup> Our review of the international evidence supports these findings; despite heterogeneity in tax rates and effect sizes, the pooled evidence suggests taxes on carbonated (fizzy) drinks would be associated with beneficial dietary change, and potentially improved health<sup>11</sup>.

As part of a larger study examining the effects of a range of health-related food taxes and subsidies on population health (full methods and results to appear in publication elsewhere), we estimated the effects of a 20% tax on fizzy drinks (both sugar-sweetened and artificially sweetened varieties) on mortality from non-communicable diseases in New Zealand.

A macrosimulation model based on household food expenditure data and demand elasticity was used to estimate the effects of such a tax. The same model was used for a similar purpose in the UK.<sup>12</sup> We used price elasticity data for major commonly consumed food groups in New Zealand,<sup>13</sup> and food expenditure data from national Household Economic Surveys.<sup>14,15</sup> Population demographics were obtained from the 2006 New Zealand Census of Population and Dwellings.<sup>16</sup> Population disease-specific mortality rates by age, sex, income and ethnic group were obtained from national mortality data for 2009.<sup>17</sup>

We estimate that a 20% tax on carbonated drinks would reduce daily energy intakes by 0.2% (20kJ/day) and avert or postpone 67 (95% uncertainty interval, 60 to 73) deaths from cardiovascular disease, diabetes and diet-related cancers. This equates to 0.2% of all deaths in New Zealand per year, comparable to the number of annual deaths from cervical cancer (average 58 per year, 2001–10).<sup>18</sup>

Furthermore, the impact would likely be larger amongst Māori and Pacific consumers due to their greater responsiveness to changes in food prices,<sup>13</sup> and amongst children and young people due to their higher consumption of such drinks.<sup>4,5</sup> Finally, there would be parallel positive impacts on morbidity (i.e. diabetes, obesity).

Data on national sales of soft drinks are commercially sensitive and difficult to access. However, we previously reported that carbonated drinks account for 1.8% of average household food expenditure in New Zealand (approximately \$166/year based on 2009/10 data).<sup>13</sup> Given there are 1.55 million households (2013 census data) total national expenditure on carbonated drinks is in the region of \$257 million each year.

A 20% tax on these drinks could therefore generate up to \$40 million revenue per year (even allowing for reductions in consumption due to tax<sup>13</sup>) if applied to all carbonated drinks, or about \$30 million if applied only to sugar-sweetened varieties<sup>19</sup> (calculations available from authors on request). Note, however, that if non-carbonated drinks high in sugar (e.g. cordials and fruit juices) were included in the tax, then tax takings would increase. Revenue from such a tax could be invested in programmes to improve population health, e.g. food in schools.

Our results are subject to some limitations. Selection of the tax scenario for modelling was constrained by data available. The national food expenditure datasets we used to calculate price elasticities combine all carbonated beverages (sugar-sweetened and artificially sweetened) in one category, meaning we could model a tax on all carbonated beverages, but not the more ideal scenario of a tax on sugar-sweetened beverages. Our modelling also underestimated uncertainty (e.g. no uncertainty in price elasticities was propagated through modelling, which would probably lead to up to a doubling in our 95% uncertainty intervals).

Nevertheless, our findings align with those of international studies<sup>11</sup>, and suggest that a fizzy drink tax would improve health and probably reduce inequalities. Practically, it is also more likely than other taxes e.g. on saturated fat, to be a politically viable first step. Given its cost-effectiveness,<sup>20</sup> a 20% tax on carbonated drinks could be a simple, effective component of a multifaceted strategy to tackle New Zealand's high burden of diet-related disease.<sup>21</sup>

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