Taxes on saturated fat, salt, and sugar improve the healthiness of grocery purchases, but changes are frustratingly small

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The EAT-*Lancet* Commission[1] highlighted that major shifts in diet are needed to meet the proposed healthy reference diet, and could result in substantial reductions in premature mortality. But how can we achieve such major shifts in the healthiness of diets? Fiscal policies are likely to be part of the solution. A meta-analysis concluded that a 10% decrease in price (ie, subsidy) increased consumption of healthy foods by 12% (22 studies) and a 10% increase in price (ie, tax) decreased consumption of unhealthy foods and beverages by 6% (15 studies).[2] However, almost all the studies identified at the time of this review[2] (June, 2014) were experiments done in cafeterias, at vending machines, or at farmer's markets, and thus restricted in their generalisability.

Subsequently, a handful of real-world fiscal policies have been tested. Perhaps the most well-known is in Mexico, where the first ever national tax on sugary beverages and non-essential energy-dense foods (ie, junk foods) was implemented on Jan 1, 2014. Within a year, purchases of taxed sugary beverages decreased by 12 mL per person per day and junk foods by 25 g (the weight of about 15 potato chips) per person per month. Although this represented a statistically significant reduction relative to predicted pre-tax trends, it is nonetheless frustratingly small.[3,4] A 2017 study in *The Lancet Public Health* presented the results of a 20-store experiment in rural Australia, in which a 20% discount on fruit, vegetables, bottled water, and artificially-sweetened soft drinks was offered for 24 weeks.[5] Fruit and vegetable purchases increased by about 20 g (the weight of around two carrot sticks).[5] Worryingly, there was a concomitant 13% increase in less healthy food purchases, which translated into increases in sodium, saturated fat, and total energy.[5]

In *The Lancet Public Health*, Wilma Waterlander and colleagues[6] tested the effect of price changes on total grocery purchases using a three-dimensional computer simulation of a leading national supermarket in New Zealand. Participants were randomly allocated to control (no change in prices), or one or more of the following price changes: 20% fruit and vegetable subsidy, 20% or 40% sugar-sweetened beverage tax, NZ$2 per 100 g or $4 per 100 g saturated fat tax, $0·02 per 100 mg or $0·04 per 100 mg sodium tax, or $0·40 per 100 g or $0·80 per 100 g sugar tax. Simulated taxes on saturated fat, salt, and sugar resulted in statistically significant improvements in the healthiness of purchases (saturated fat tax mean absolute difference 1·77%, 95% CI 1·03 to 2·52, p<0·0001; sugar tax 1·09%, 0·26 to 1·91, p=0·0099; and salt tax 1·31%, 0·50 to 2·13, p=0·0016), but these too were frustratingly small, with less than a 2% absolute increase in purchases of healthy foods above the control condition, in which 68% of food purchases were classified as healthy. Worrying substitution effects were also observed. Although the saturated fat and salt taxes resulted in about a 4% increase in fruit and vegetable purchases as a proportion of weight of all food purchased, they also resulted in a 3–5% increase in the percentage of total energy of all food purchases from sugar.

Although this study[6] represents a promising methodological direction for generation of rigorous scientific evidence upon which policies to improve the healthiness of diets could be based, many questions remain. First, how would the food industry respond to these price changes? For example, if the food industry responded to a saturated fat tax by substituting sugar for saturated fat, the observed increases in percentage of total energy of all food purchases from sugar could be even greater in the real world than what was observed in this simulated experiment.[6] Rather than a reactive response to industry, it is time for governments to be proactive and set comprehensive maximum acceptable levels (ie, industry quality standards) for harmful nutrients, especially added salt, sugar, and trans-fats. This strategy has proven successful, for example, with respect to salt in the UK[7] and trans-fats in the USA.[8]

Another important and related question is what other policies should be adopted concurrently with these price changes to maximise population health benefits? The experiences of countries such as Mexico, Chile, and the UK show that a suite of coordinated policies, including taxes and subsidies, as well as improved point-of-purchase labelling (eg, front-of-pack traffic light and warning labels), food marketing standards across all

formats (eg, plain packaging), and population-level monitoring for accountability are key.[9]

The small but positive effects observed in this virtual supermarket should not discourage us from pursuing taxes and subsidies as part of a multicomponent, integrated governmental strategy to tackle unhealthy diets. Implementation will not only require rigorous scientific evidence, but also public demand for action and responsive governments. Unregulated markets are an important reason we are in our current predicament and they are not going to get us out of it.[10] Regulation of the food industry will be required to ensure that reformulation in response to price changes does not produce unintended consequences and to achieve our shared societal goal of maximising population health.

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