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Viewpoint

Death by Diet: The Role of Food Pricing Interventions as a Public Policy Response and Health Advocacy Opportunity

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Through their professional designations, health professionals have a responsibility to and are being called on to engage in, support, and advocate for population-based health strategies and policies, particularly as they relate to the prevention, control, and management of cardiovascular disease.[1-5] For example, the Royal College of Physicians and Surgeons of Canada competency framework (CanMEDS) identifies physicians as health advocates with an individual and collective responsibility to use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.[6]

In Canada, as in most industrialized countries, preventable cardiovascular disease, diabetes, cancer, and chronic respiratory disease account for roughly two thirds of all deaths each year.[7,8] A poor diet—broadly defined by the World Health Organization as being high in sodium, saturated and trans fats, and free sugar and low in fresh fruits and vegetables—is among the leading risk factors.[9] More specifically, it has been estimated that approximately 80% of cases of hypertension, a condition that affects 7.5 million Canadians, is attributed to unhealthy diet, particularly one high in dietary sodium.[10] Approximately 60% of adults and 31.5% of children are overweight or obese in Canada, largely because of unhealthy diets and sedentary lifestyles.[11,12] In 2001, 80% of the Canadian population had diets that were more than 50% of highly processed food and beverage products.[13] More recent national estimates on dietary sodium show that Canadians consume around 3500 mg per day, which is much higher than currently recommended levels.[14]

Indeed, unhealthy diets are the leading causes of death, disability, and life-years lost in Canada. In 2010, this translated to an estimated 65,722 Canadian deaths and 864,032 life-years lost,[15] with the projected cost averaging between $6.6 and $11 billion in health care expenditures and lost productivity.[16] Recent data show that a 1% relative reduction in the number of individuals with excess weight in Canada starting in 2012 would result in an annual reduction in economic burden of $3.2 billion by 2031.[17]

Against this backdrop, greater emphasis on population approaches to improve diet and reduce cardiovascular risk and disease is urgently needed. In Canada, the emphasis remains largely on the use of public education campaigns and individually based strategies that focus on behavioural change; that is, motivating individuals to consume more healthy foods and beverages. The caveat is that individual behaviour is highly constrained by social and economic factors. Although patient-specific behavioural interventions are effective for some individuals and remain an important health promotion strategy, without concurrent interventions that address the broader social, cultural, and economic environment driving dietary

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choices, the rising tide of diet-related cardiovascular diseases is likely to continue.[18-20]

Taxing unhealthy foods and beverages and subsidizing the cost of healthy food and beverages—namely, fresh fruits and vegetables—are identified as potentially effective policy interventions to improve diet by leading international health committees and organizations.[18,21,22] Indeed, a growing number of countries implementing food and beverage taxation schemes, including the United States, Hungary, France, and Denmark.[23] Recent systematic reviews have shown that changing the price of certain foods and beverages has an impact on consumption and demonstrates promise for changing diet and diet-related health and disease outcomes.[24-26] Although the majority of these reviews are based on modelling studies, which have noted limitations,[26,27] they nonetheless offer important guidance for cardiovascular disease prevention initiatives and for policy makers.

Several modelling studies conducted in the United States have predicted that a 20% tax on sugar-sweetened beverages would reduce energy intake by 29-209 kJ per day among adults,[27] with reductions of up to 213 kJ per day among children.[28] Such reductions, however, are not consistently observed and are not necessarily applicable across other food categories.[25] For instance, Chouinard et al.[29] found that the impact of a 10% and 50% tax on dairy products based on fat content would be marginal, decreasing consumption by only 1% and 3%, respectively, with no impact on body weight. Regarding this conclusion, it has been argued that substitution patterns with nontaxed products, which is often not assessed, can undermine the intended benefit or effectiveness of food taxes as a sole strategy.[26,30] Indeed, a US study looking at consumption and dietary outcomes in children and adolescents between 1989 and 2006 found that soft drink taxation (averaging 3%) negated the observed benefit of reduced soft drink consumption (and associated body mass index [BMI], overweight, or obesity) largely because of increases in calories from other high-calorie, nontaxed beverages, including juice or whole milk.[31] These caveats emphasize the need to both monitor and adjust fiscal policies and to have adjunctive policy interventions to address lack of efficacy and other potentially unintended consequences.

Regarding health outcomes, the evidence also remains mixed, with several studies showing little or no significant association between taxation and subsidies on weight status.[32,33] These findings are not conclusive with wide variability and due to differences in pricing schemes, food type, and population demographics.[34,35] For instance, a systematic review of US studies found that higher fast food prices were associated with lower weight outcomes among adolescents, whereas lower fruit and vegetable prices were most strongly associated with decreased BMI among low-income adults and children.[36] Several studies acknowledge the potentially regressive nature of food taxes on lower income individuals, which may limit the effectiveness of taxation schemes for these populations.[29,31,37,38] It is noteworthy that BMI and other weight outcomes are not indicative of healthy or unhealthy eating per se but are an indicator of excess caloric intake.

Some studies further suggest that economic policies may impact cardiovascular disease outcomes; however, they are inconclusive. Basu et al.[39] recently predicted that if a sustained 20% sugar-sweetened beverage excise tax was implemented in India, it would reduce overweight and obesity prevalence by 3.0% and type 2 diabetes incidence by 1.6% between 2014 and 2023. A similar tax (ie, penny per ounce or 20% tax on sugar-sweetened beverages) in the United States was estimated to prevent 2.4 million diabetes person-years, 95,000 coronary heart events, 8000 strokes, and 26,000 premature deaths over a 10-year period, save more than $17 billion in medical costs and generate roughly $13 billion in annual tax revenue.[40] By contrast, a UK study predicted that taxing less healthy food without a complementary subsidy scheme could increase cardiovascular disease and cancer deaths as a result of compensatory purchasing of untaxed unhealthy foods and beverages but taxes and subsidies together could avert up to 6400 cardiovascular disease and cancer deaths yearly.[41] Applying a 1% subsidy to decrease fruit and vegetable prices in the United States, by contrast, could prevent 6733 cases of coronary heart disease and 2946 cases of ischemic stroke per year and result in an estimated cost of $1.3 million per life saved over a 40-year period.[42] The transformation of a relatively small subsidy to consumption and cardiovascular disease outcomes nevertheless is a substantive extrapolation.

Evaluating the impact of price increases/decreases in the real world setting remains a challenge in part because many studies are of low quality, are laboratory based, and are restricted to specific settings and demographics.[43-47] Nevertheless, they address some important research gaps regarding consumer behaviour. Elbel et al.[48] tested the potential of 5 different taxation (at 30%) and labeling conditions among a high- need population to induce consumers to purchase healthier foods and beverages. Results showed that consumers were 11% more likely to purchase healthier items under a 30% tax condition and 6% more likely under a labeling condition compared with baseline; however, coefficients were larger and more significant for taxation conditions. Comparably, a simulated Dutch supermarket study looking at a 50% price increase in high-energy-dense foods among a more general adult population found that the tax reduced the purchase of high-energy-dense foods by 16%, which translated into an average reduction of 419 kcal per person per day.[47] The effects were particularly significant in reducing purchases of foods with calories from carbohydrates and did not influence purchases of low-energy-dense foods.[47] Similar studies by Waterlander et al.[49,50] examining subsidies as well as taxes found that like large taxes, large subsidies (50%) significantly increased healthy food purchases, particularly vegetables. Because total calories purchased also increased, the subsidy did not improve the proportion of healthy food purchased overall. Further, the authors found no significant positive or negative effects associated with a 25% price increase on unhealthy foods,[49] which is consistent with other findings.[51]

Despite the majority of studies focusing on taxes or subsidies alone, several others have concluded that combining taxes and subsidies together along with nutrition education is more effective than either intervention on its own.[41,43,45,46,49] More research is needed to determine how to maximize the impact of pricing intervention, including substitution, on dietary decision making.[34] Further, some controversy remains over the implementation of food taxes because of their potential impact on lower income populations. More research is required to assess the impact of an unhealthy food tax on