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Author Response to “Testing Causal Assumptions in Obesity Research”



We appreciate the interest generated by our paper evaluating the population impact of the 1989 Canada–U.S. Free Trade Agreement (CUSFTA) on Canadian diets.¹ In an accompanying letter, Dr. Voss, MD, questions (1) whether macro changes in food supply actually correspond to changes in food consumption; (2) whether experimental testing of FTAs is unfeasible; and (3) the use of causal language. Below we respond to each of Voss's claims in turn.

First, in our paper we estimated the potential weight gain that might have occurred if 50%–100% of the approximately 170 kcal/capita/day rise in calorie availability following CUSFTA translated into caloric intake. Voss cites a cross-national analysis showing that the relation between population food availability and obesity prevalence was concave in 2008. This is further supported by reference to two additional observational analyses of the relationship between changes to food availability and weight circumference and obesity.²

However, none of this relates to the relationship between food availability and caloric intake. If there is a non-linear association between calorie availability and obesity, this need not imply the link between availability and caloric intake is also non-linear. Alternatively, a non-linear relation between food availability and weight gain can arise from multiple factors, including a lag time in weight gain, differences in physical activity, and other unmeasured factors.

Second, Voss suggests that it is “unimaginative” to deem experimental testing of FTAs unfeasible. Indeed,

we would be delighted to collaborate with governments to sequentially implement future FTAs along, for example, “national subdivisions.” Yet, as recent difficulties in negotiating new trade deals such as the Transatlantic Trade and Investment Partnership have amply shown, FTA negotiations are complex, highly politicized, and require agreement and compromise among multiple parties.³ We concede that, in an ideal world, everyone concerned might cooperate in an experiment, but we cannot see how this is realistic. Moreover, it is completely impossible to do so for an historic agreement, such as CUSFTA.

In light of these limitations, the United Kingdom Medical Research Council recommends using quasi-natural experimental designs, as we have done, as a means of fulfilling Bradford Hill's criteria for causality.^{4,5} The key difference from a randomized trial is that, here, the intervention, CUSFTA, is outside researchers' control. We followed best-practice methods, including the synthetic control method, and advocated for analyzing the population-level impact of FTAs.^{6–11}

Finally, Voss states that we assert causality, claiming that we write “higher availability of American food caused an average between 1.8 kg and 12.2 kg of weight gain throughout the Canadian population.” In fact, a careful read of the manuscript reveals we never use the term “cause” or any variant thereof, in relation to CUSFTA's impact on weight gain. In reporting our findings we cautiously use the language of association, refer to CUSFTA's “impact” using suggestive phrasing, and report transparently the potential constraints on causal interpretations in this specific case.

What is clear is that our paper demonstrates the potential for massive, and potentially unintended, consequences for health of FTAs.

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