Market deregulation → ↑ fast food consumption → ↑ obesity. Clever international study that includes NZ data

4 February 2014

Tony Blakely

Professor Tony Blakely.

A clever study just published in the Bulletin of the World Health Organization has analyzed how *changes* in fast food transactions per capita within 25 high-income countries was associated with *changes* in body mass index (BMI). The change-change analysis is important, as it addresses confounding bias that plagues many studies. The study found that an increase of 10 fast food purchases per person per year is associated with increases in BMI by 0.33 units (or 1 kg for an average height person). Of note, the increase of 10 fast food purchases per person per year was exactly that observed for NZ during the 1999 to 2008 period covered by this study.

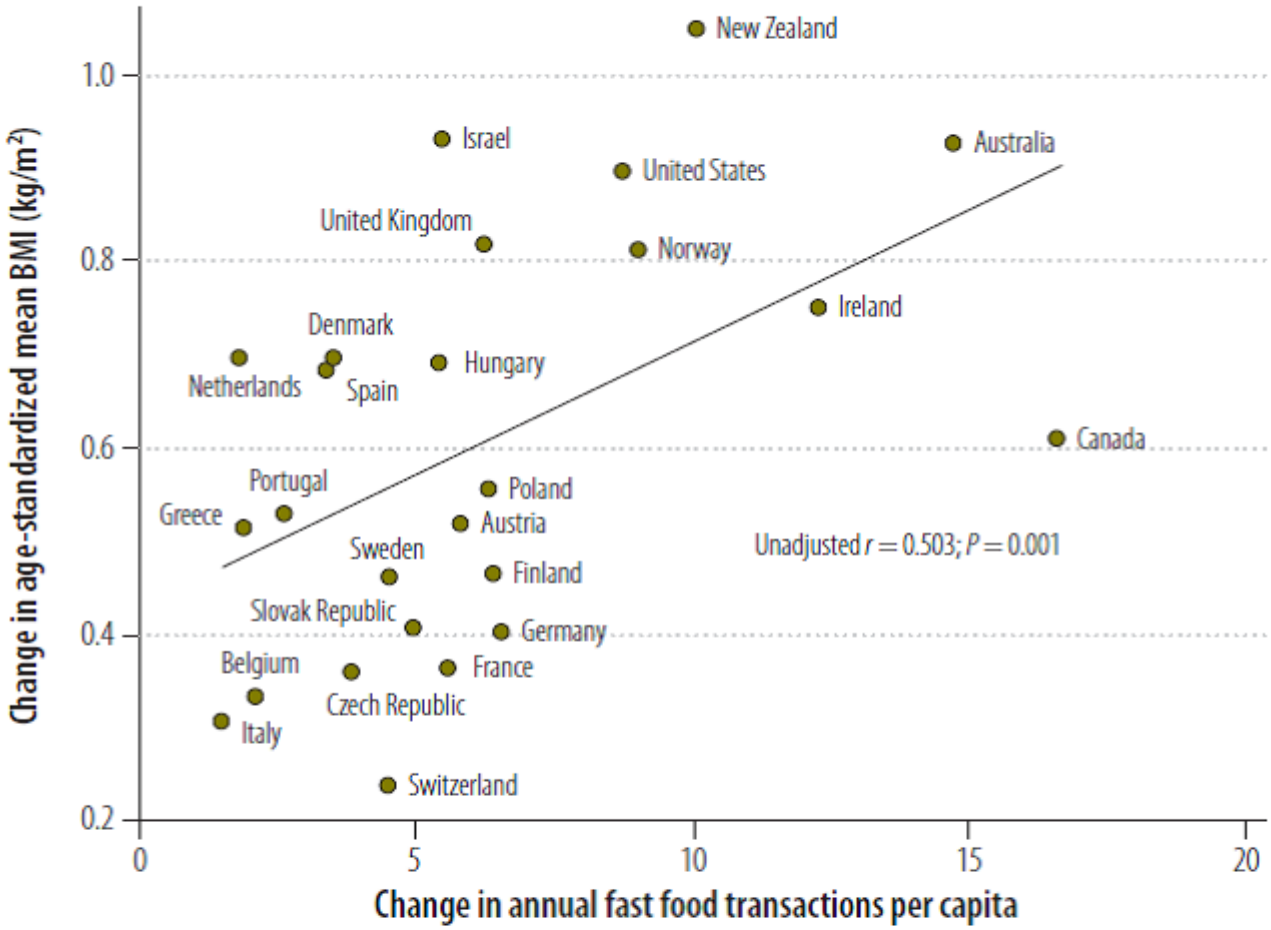
The study also suggests that much of the increase in fast food transactions was due to market deregulation. Thus, the authors point to global market forces opening the door to fast food companies, leading in turn to an important driver of the obesity epidemic. That is, a market failure – if you believe that increasing obesity rates is not what the average citizen wants as an outcome of deregulated markets.

In the rest of this blog I will address the study strengths and limitations a bit more. But if you are not interested in the detail on the methods, then just jump to the bottom of this blog post for 'Implications'. And see TV interview of Boyd Swinburn and another one by Tony Blakely talking about this paper in the last 24 hours.

Study detail

The Figure below is taken straight from the study. The 25 countries included are plotted on the graph. The x-axis shows the increase in fast food transactions per person over the ten years of the study – NZ increased by 10. The y-axis shows the increase in BMI – NZ increased by just over 1.0 BMI units. So, this change-change figure immediately gives a strong impression of a robust association.

Fig. 1. **Change in age-standardized mean body mass index (BMI) as a function of change in average annual fast food transactions per capita[a] in 25 high-income countries of the Organisation for Economic Co-operation and Development, 1999–2008**



United Kingdom, United Kingdom of Great Britain and Northern Ireland; United States, United States of America.

[a] Meals and refreshments sold annually per capita in local and transnational fast food outlets, including chain restaurants, independent eateries and convenience stores.

Note: The figure illustrates the positive correlation between changes in age-standardized mean BMI and changes in the number of annual fast food transactions per capita between 1999 and 2008.

Sources: Age-standardized mean BMI: Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group;[1] average annual fast food transactions per capita: Euromonitor's Passport Global Market Information Database.[28]

Next, the authors undertook something called fixed effects regression, which (by design) adjusts for all confounders that differ between countries, and adjusted for measured time varying potential confounders (e.g. GDP, percent living in urban areas). The result was a 0.033 (95% CI 0.013 to 0.052) increase in BMI for each 1 unit increase in fast food transactions per capita. Or what I have converted to a 1 kg increase in body weight for an average height person, for an increase of 10 fast food transactions per person.

The authors then pushed the envelope a bit – in a logical way. They showed that increasing economic freedom (e.g. trade, labour, monetary and other 'freedoms') strongly predicts increasing fast food transactions. Then they used this economic freedom variable as an instrument variable for fast food transactions, a smart methodological technique that

econometricians use to further address confounding. Result? The association of fast food transactions with BMI weakened by about a third, but was still statistically significant. The results are looking stronger again.

Finally, the authors also looked to see whether sugary drink consumption, total caloric intake or animal fat explained *why* increasing fast food transactions is associated with increasing BMI. (I.e. is it the Coke, the Big Mac, or the whole Value Meal?) Interestingly, they find that sugary drinks make a small contribution – small only, but consistent with a range of other evidence. However, there was no mediation by total calories or animal fat – contrary to expectation, and weakening the findings a little. However, it might just be that total calories and animal fat was mis-measured so much in the data available, that this variable was not reliable.

This study is not definitive – indeed, studies rarely are. The above fat and calorie result erodes the coherence a little. There may be other unmeasured variables that changed over time with countries, and which make this observed association spurious. And one can always quibble about whether the instrument variable was truly a good instrument variable. However, I think we have to conclude that the study is pretty robust and policy makers should give its findings some weight.

Implications for policy?

Free markets and capitalism are mostly good. They get us flat screen TVs and other desirable commodities, and – relevant here – year round access to fruit and vegetables as well. But free markets also have failures, such as the obesity epidemic. Does this mean that we should tighten the reins a little on market freedoms around fast food – just as our society does already with tobacco, alcohol and thousands of consumer products covered by safety regulations (from car design to fire safe children's pajamas)? This might make sense – given we know society is generally concerned about obesity, diabetes, heart disease and cancer. It is also concerned about the impact of chronic disease burdens on the tax-payer funded health system.

So what are some of the intervention options to address this 'market failure'?

- Ensure healthy diets, and a sovereign nation's ability to influence them, are not compromised by free trade agreements, e.g. the Trans-Pacific Trade Partnership.
    - Place controls on marketing of fast food – especially to children (eg, during children's TV viewing hours)
    - Regulate the fast food industry to reformulate food (e.g. reduce salt in burgers, saturated fat in patties, and raise fibre levels) and reformulate menus (e.g. making non-sugary drinks the default option). (Trialing voluntary agreements before regulation is often preferred by Government and the food industry, but it is also often unsuccessful or limited in its impact – remember the Food Industry Accord signed in 2004?)
    - Using price signals, most notably a tax on sugary drinks (see other Public Health Expert blog posts).

Some will view these measures as 'nanny state'. But if society wants to have a healthier population, and protect the long-term financial viability of its publicly funded health system, then society can justifiably curtail deleterious and unintended consequences of the free market.

Public Health Expert Briefing (ISSN 2816-1203)
