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Where local policy matters

Statistical method could point to "pockets of good practice" in fight against obesity

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A statistical technique that teases apart local trends from regional trends in obesity prevalence over time could help public health scientists to identify areas where local interventions are having an impact. The technique, described in an article published this week, could be applied to any public health problem, says lead author Marc Barthélemy — provided the right type and volume of data are available.

Barthélemy and colleagues tested their method with three datasets, one of which consisted of US prevalence rates for obesity between 1995 and 2008. Using these data they separated and quantified how much of the obesity trend observed in each state was specific to that location, and how much of it followed the "collective", US-wide trend.

States where changes in obesity rates are not driven by the national trend would reflect a stronger influence by factors unique to that particular area — the built environment, for example, or availability of fast food outlets — as opposed to "external" factors, such as policies on the sale of machine-dispensed snacks in schools across the country.

"We show that since the year 2000, external factors dominate, and maybe more importantly that states with the same level of prevalence have very different dynamical behaviors, thus calling for the need of a detailed study state by state," write the authors in *Proceedings of the National Academy of Sciences USA*.

Unpicking these trends allows researchers to identify specific areas where local policies are having a relatively larger impact on obesity rates, says Peter Scarborough, from the Department of Public Health at the University of Oxford, UK. That impact could be positive or negative. But once these areas are spotted they can be studied further, he suggests, to determine which risk factors might be at play — or to find out which policies have been effective.

Rates of obesity, which increases the risk of physical and mental health conditions, are rising in both **developing** and developed countries. Efforts to combat obesity tend to focus on promoting a good-quality diet and physical activity, as well as changes to the built environment to encourage healthy behaviours. **'Let's Move'**, an initiative launched last February by the American First Lady Michelle Obama, aims to wipe out childhood obesity "in a generation" by targeting individuals and communities through an overhaul of policies at both the national and local level.

Assessing the efficiency of local policies is a tough problem, comments Barthélemy for EHTF News. For public health scientists faced with data on how obesity rates change over time, a typical way of extracting local trends has been to subtract those data that apply to a particular region from a national average; or, to simply check if the local figure is lower. But these methods are not accurate enough and can be misleading, he explains, as they assume that the local trend tends to be small by comparison.

"This assumption is not just a technical detail," adds Barthélemy. "It implies that local policies' effects are always negligible which in many real world cases is probably incorrect."

Scarborough explains that through their method, the authors are saying that "each area will not have the same way of relating to the global trend". Their analysis reflects this by being based on a multiplicative model of the relationship between local and global trends, rather than an additive model.

This is an improvement over previous methods, according to Scarborough, and introduces a new tool that could also be applied in the UK using data from the National Health Service. Although in the UK regional differences in policy are less pronounced, compared with the USA, the method may be able to answer different questions, he suggests — and could still help to identify "little pockets of good practice".

"I believe that there are many datasets in the health domain where this method could be used," says Barthélemy. It could give some insight into changes in prevalence for any type of disease, he suggests, including diabetes and cardiovascular diseases.

For the method to work, a set of time-series data would be needed to estimate prevalence rates in a group of different areas within a larger population. These areas could be regions or cities, and their number should be large enough, Barthélemy explains — at least 50. "The larger the number of subunits... the more reliable the method," he says, adding that the results should also be checked for consistency with the model's assumptions.

Reference and links

1. Barthélemy M, Nadal JP, Berestycki H. Disentangling collective trends from local dynamics. *Proc Natl Acad Sci USA 2010.* **doi:** **10.1073/pnas.0910259107**

US Centers for Disease Control and Prevention information on overweight and obesity

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