Neighbourhood fast-food outlets and type 2 diabetes

An analysis of UK cross-sectional data found that the number of fast food outlets in a neighbourhood was associated with a small increase in the risk of type 2 diabetes.

Overview: Diabetes mellitus is a group of metabolic disorders in which blood glucose is persistently raised (NICE 2015). People with type 1 diabetes are deficient in insulin, the hormone responsible for promoting glucose absorption, whereas those with type 2 diabetes are resistant to insulin and may not release sufficient insulin from their pancreas.

In England in 2010–12, 12.4% of people aged 18 years and over who were obese had diagnosed diabetes, 5 times the proportion among people with a healthy weight (Public Health England 2014). Exposure to fast-food outlets has been shown to increase BMI and the risk of obesity (Burgoine et al. 2014), and could therefore also increase the risk of type 2 diabetes.

Current advice: The NICE guideline on preventing type 2 diabetes: population and community-level interventions recommends that people should consume as little as possible of: fried food; drinks and confectionery high in added sugars (such as cakes, pastries and sugar-sweetened drinks); and other food high in fat and sugar (such as some take-away and fast foods).

Commissioners and local authorities should work with local food retailers, caterers and workplaces to encourage local provision of affordable fruit and vegetables and other food and drinks that can contribute to a healthy, balanced diet. Existing planning mechanisms should be used to increase the opportunities available for local people to adopt a healthy diet. For example, planning policies should consider healthier eating when reviewing applications for new food outlets.

The NICE pathway on preventing type 2 diabetes brings together all related NICE guidance and associated products on the area in a set of interactive topic-based diagrams.

New evidence: Bodicoat et al. (2014) analysed cross-sectional data from 3 UK studies to investigate whether the number of fast-food outlets in a neighbourhood was associated with type 2 diabetes in the residents.
Data were taken from 2 randomised controlled trials that recruited people at high risk of developing diabetes (Let's Prevent Diabetes and Walking Away from Diabetes) and 1 trial that recruited people in the general population (ADDITION-Leicester). These studies recruited people from primary care (response rate=22%) and screened them for type 2 diabetes. Participants were then randomly assigned to a healthy lifestyle intervention or a cardiovascular risk management programme. Bodicoat et al. (2014) used the cross-sectional data from the screening stage of each study.

The absolute number of fast-food outlets in the participants’ neighbourhoods was measured using listings in an online business directory. Businesses advertising ‘fast food’, ‘fish and chips’ or ‘take away’ were categorised as fast-food outlets. ‘Neighbourhood’ was defined as within 500m of a participant’s home, as determined by their postcode.

A total of 10,461 people aged 59 years on average were included in this study. More than half (53%) of participants were male and 21% were from black, Asian and minority ethnic groups. On average, participants had 2.1 fast-food outlets in their neighbourhood.

Analyses of the link between fast-food outlets and type 2 diabetes were adjusted for social deprivation, rural or urban location, ethnicity, age and sex. The number of fast-food outlets in a neighbourhood was associated with a slightly higher risk of type 2 diabetes (odds ratio [OR]=1.02, 95% confidence interval [CI] 1.00 to 1.04, p=0.02). This finding corresponds with 1 extra case of type 2 diabetes for every 2 additional outlets per 200 residents or in a 500m radius. The number of fast-food outlets also had small associations with obesity (OR=1.02, 95% CI 1.01 to 1.03, p<0.01) and BMI (unstandardised regression coefficient=0.04, 95% CI 0.00 to 0.08, p<0.01).

The authors warn that the cross-sectional nature of the study means that it is not possible to infer a causal effect of fast-food outlets on diabetes and obesity. In addition, the number of fast-food outlets was measured in 2014, but participants were screened for diabetes up to 10 years earlier (2004–11). Two of the trials that provided data for this analysis specifically recruited people at high risk of type 2 diabetes.

**Commentary by Esther Trenchard-Mabere, Associate Director of Public Health, London Borough of Tower Hamlets:**

“This study builds on existing evidence of an association between the number of fast-food outlets in a neighbourhood and the prevalence of adult obesity. It adds to this evidence by also showing a small but statistically significant association with the prevalence of screen-detected type 2 diabetes.

“A strength of this study is that it demonstrates that these associations, although reduced, remain statistically significant after adjusting for possible confounders. This finding could strengthen the case for restricting or reducing the numbers of fast food outlets in an area on public health grounds when considering planning permission.

“However, as the authors acknowledge, the study is not able to demonstrate that the association between fast-food outlets and diabetes and obesity was causal. The biggest weakness is that the estimation of the number of fast-food outlets was collected several years after the health outcomes data. This issue of timing is particularly pertinent. As the authors point out, it is possible that demand precedes increased supply, with the high number of fast-food outlets reflecting the preferences of local residents.

“However, this might not be a simple question of which is the cause and which is the effect. Another possibility is that exposure to fast-food outlets could lead to the formation of habits, increasing demand and further stimulating supply in a classic positive feedback loop. Different answers to the question of cause and effect (individual preferences versus availability or exposure) could be obtained depending on the methodology and type of data collected. A methodology based on systems thinking that maps the complex inter-relationships and identifies feedback loops might be more appropriate than a linear model that attempts to control for confounders.
“Strengthening the evidence on the impact of fast food availability on health outcomes is important. But many of the difficulties in implementing restrictions to the number of fast-food outlets are related to wider economic and social considerations – for example, the impact on the local economy – that require different types of evidence to address.”

**Study sponsorship:** National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care – East Midlands, the Leicester Clinical Trials Unit, and the NIHR Leicester – Loughborough Diet, Lifestyle and Physical Activity Biomedical Research Unit.

---

**About this article:** This article appeared in the September 2015 issue of the [Eyes on Evidence newsletter](https://www.nice.org.uk/about/whatwedo/whatwedo/eyesonevidence). This free monthly newsletter from NICE Evidence Services outlines interesting new evidence and what it means for current practice. The articles do not constitute formal NICE guidance. The commentaries included are the opinions of contributors and do not necessarily reflect the views of NICE.

To receive the Eyes on Evidence newsletter, please complete the [online registration form](https://www.nice.org.uk/about/whatwedo/whatwedo/eyesonevidence).