



The geography of
Obesity

FOR CANADIAN RESEARCHERS INVESTIGATING
HOW THE DESIGN OF CITIES AND SUBURBS
AFFECTS OUR HEALTH, GOD IS IN THE DETAILS

BY PAUL WEBSTER
ILLUSTRATIONS BY GUY PARSONS

ON A RECENT TOUR AROUND LONDON, ONT., Jason Gilliland zipped down the car window and jabbed a finger at a thicket of fast-food outlets and apartment towers facing a suburban highway. By profession, Gilliland teaches urban geography at Western University, where he runs the Human Environments Analysis Laboratory. By persuasion, however, he's a food fanatic whose career has been devoted to probing how city planning affects diet and health. "What you're looking at there," he fumed, "is a highly obesogenic cityscape. Junk food, highways, apartment buildings and parking lots. And pretty much zero opportunity for the people to take a walk or ride a bike."

The term "obesogenic," Gilliland explained, refers to a wide array of conditions that promote obesity, including inadequate physical activity and poor diet. It was coined by researchers probing why obesity has roughly doubled in prevalence in many countries, including Canada, since 1981. With about one in four adults and almost 10 per cent of youth obese, according to a 2011 federal government report, researchers from numerous disciplines including geography are flocking to the topic, with work on the linkages between food availability, neighbourhood environments and residents' physical health conditions also underway in Vancouver, Edmonton, Saskatoon, Waterloo, Toronto and Montreal.

Rounding a corner, Gilliland pointed at a billboard advertising units for sale in a newly completed retirement complex. "Why Walk?" the billboard read. "That says it all," Gilliland exclaimed. "Shouldn't it say why not walk?"

Jason Gilliland has turned the entire city of London — with its walkable historical core surrounded by concentric rings of largely unwalkable modern suburbs — into a laboratory.

proximity of unhealthy food establishments on adolescents' eating behaviours," Gilliland's study concluded, "environmental strategies are vital to help combat the increasing obesity epidemic."

These days, identifying those strategies — the factors in urban planning that can help slow and reverse the rising rates of obesity — is Gilliland's biggest preoccupation. To do it, he's turned the entire city of London — with its walkable historical core surrounded by concentric rings of largely unwalkable modern suburbs — into a laboratory. Acting as a consultant to the city's government, he recently helped revise its future development master plan to include 94 references to healthy food availability. "Food wasn't mentioned in the previous plan," says Gilliland, who emphasizes the need to inform transportation planning with health considerations.

Meanwhile, at his lab on campus at Western University, Gilliland heads a four-year study of 851 school children from 46 schools in urban, suburban, rural and small-town neighbourhoods. The aim, he explains, is to nail down a massive lode of information about the kids' physical activities, their food consumption, their body weights and the geography they inhabit. By studying the dietary behaviours and physical activity levels of kids from inner-city neighbourhoods, suburbs and outlying villages who either walk or are driven or bused to school, Gilliland intends to gain a comprehensive matrix of health-related information. "Our hope," he explains, "is to better understand how urban and suburban environments drive obesity."

It's not an idle question. According to a study of adolescent eating patterns Gilliland published in 2012, some of London's suburban neighbourhoods, with their heavy bias toward automobile dependency, their dearth of sidewalks and bike paths and their multitude of low-quality food outlets, are highly obesogenic. "Given the negative impact of the close

Gilliland's research into the causes of obesity is powered by reams of data from multiple sources. One key dataset emanates from a geographical information system (GIS) laboriously compiled by his team for the entire city of London. The system tracks about 500 variables, ranging from climate conditions to green space, roadways and food sources.



Alongside this is data from electronic movement-tracking devices known as accelerometers — designed to record physical activities as well as trips to restaurants and other food outlets — and GPS units, both worn by each of the children enrolled in the study. "We think we'll wind up with something like a billion data points per child," Gilliland enthuses. By cross-referencing data on the children's physical conditions (which is collected periodically throughout the study) with data on their movements, as well as the GIS data on the locations of retail food sources, Gilliland expects to achieve powerful new insights. "You have to use mixed methods to understand the causes of obesity," he explains. "That's why there's a real need for geographers in obesity research. The geography of health has become a hot topic."

Rachel Engler-Stringer, a nutritionist in the department of community health and epidemiology at the University of Saskatchewan, shares Gilliland's conviction that geographers can play vital roles in probing obesity. Some of her research currently focuses on the Good Food Junction, a food co-op in Saskatoon's gritty west end. At first glance, the store seems like any other ordinary no-nonsense urban supermarket. But many people living nearby consider it to be something of a miracle. Long abandoned by major supermarket chains, the area around the store is described by nutritionists as a "food desert": according to a 2013 study published by the Saskatoon Health Region's Public Health Observatory, Saskatoon's most deprived neighbourhoods have significantly fewer supermarkets than its wealthy neighbourhoods do.

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To overcome their lack of access to healthy food, community members formed a co-op, built the store and opened it for business in October 2012. Now Engler-Stringer is probing whether the store is yielding health benefits to residents in the area, as part of a larger investigation into the relationship between children's health, neighbourhood geography and food availability in Saskatoon.

Using data from a city-wide dietary survey conducted within a set of studies mapping the location and type of every retail food outlet in the city and characterizing the food environments in which Saskatoon families live, over the course of the next two years Engler-Stringer will closely monitor the health of local children, including their body weight, to probe whether neighbourhoods that lack supermarket access have heightened obesity levels. Like Gilliland in London, Engler-Stringer says Saskatoon, with its contained geography of 70 distinct neighbourhoods and its population of 246,000, "offers ideal conditions for research to understand the factors that drive obesity."

Innovative approaches such as Gilliland's and Engler-Stringer's are urgently needed, argues Mark Tremblay, director of healthy active living and obesity research at the Children's Hospital of Eastern Ontario Research Institute in Ottawa. Better analyses of the links between physical inactivity — or sedentary behaviour, as Tremblay calls it — and obesity are in high demand, he explains. The widespread escalation in body mass, Tremblay argues, can be understood only by closely studying the ways that Canadians eat, sleep and move around the places they live. "The minutiae of our daily activities has changed in ways that promote obesity," he argues. "We need to know much more about the lifestyle factors propelling this epidemic."



‘Food swamps,’ neighbourhoods where high-fat, high-calorie foods are plentiful and healthier foods are rare, are a common problem.

Leia Minaker, a public health scientist with the Propel Centre for Population Health Impact at the University of Waterloo who recently completed a national survey of research into the geography of food availability in Canada, says that of 15 recently published Canadian studies of food access in relation to diet-related health outcomes, 12 concluded that the food environment plays a significant role in health. “In the past, the idea was that with enough knowledge about healthy eating, individuals would choose nutritious diets to prevent future illnesses,” Minaker explains. “But as we’ve come to factor the food environment into the picture, it’s becoming clearer that geographical factors like urban landscapes also matter in determining what people eat and how much exercise they get.”

Not all cities are the same, Minaker cautions. While some, such as Saskatoon, appear to have significant food deserts, the most common problem in Canadian cities may not be with food deserts, she argues, but rather “food swamps” — neighbourhoods such as the London suburbs where sources of high-fat, high-calorie foods are plentiful and sources of healthier foods are rare. Among people living in such areas — especially those without easy access to automobile transportation — the poor quality of the most easily available food could obviously heighten the risk of obesity.

But not everyone agrees that the location of food sources is pre-eminently important when it comes to persuading

people to buy healthy food. According to a 2014 study by researchers with the Virginia-based Rand Corporation about the relationship between obesity and decision-making by food shoppers in Pittsburgh, Pa., the price of food may play a more crucial role in influencing diet. “Although distance and store prices were independently associated with obesity,” the study found, “only price remained significant when both variables were included.” One problem, the study found, is that low-price supermarkets tend to display and promote junk food more prominently than high-price supermarkets do. “Although low- and high-price stores did not differ in availability, they significantly differed in their display and marketing of junk foods relative to healthy foods.” The study concluded that these differences in how food is marketed may explain why shoppers at high-price food stores were less likely to be obese.

In London, Jason Gilliland acknowledges that the verdict is still out on the links between obesity and neighbourhood planning. “I’d be strung up alive if I pointed to a specific neighbourhood as being especially obesogenic,” he admits. “But I certainly point to a certain type of neighbourhood and call it that. I’m talking about neighbourhoods designed around cars and not pedestrians. And, unfortunately, just about every neighbourhood that’s been built in this country in the past half century matches this description.”



CANADIAN GEOGRAPHIC EDUCATION

Find a lesson plan relating to this feature and the associated map on page 30 at cgeeducation.ca/resources/in_the_classroom, where there are more learning resources for other stories from past issues.



See some of the maps that Jason Gilliland and his team at the Human Environments Analysis Laboratory have created during their research into obesity at mag.cangeo.ca/apr15/obesity.