OBESOGENIC ENVIRONMENTS



ABSTRACT

Obesity and overweight have increased dramatically in recent times in Canada, as in many other countries around the world. The speed at which this increase has taken place means that it cannot be due to some genetic change in the population. More convincing are explanations that look at the everyday environments in which we live and work as well as at the strong social patterning to the way we eat and spend our leisure and work time for the increase in overweight and obesity. Any policy response to the rise of obesity and overweight that focuses only on individual interventions and does not recognize the roles of socially-patterned behaviours as well as routine environments is unlikely to produce the kind of population-wide changes needed.

RÉSUMÉ

Depuis les dernières années, l'obésité a vu une croissance dramatique au Canada ainsi qu'à travers le monde. La rapidité de cette croissance indique qu'elle ne peut être causée par un changement génétique dans la population. Des explications plus convaincantes étudient l'environnement quotidien dans lequel nous vivons et travaillons ainsi que les tendances sociales d'alimentation et la façon dont nous occupons notre temps de loisir et de travail comparativement à la croissance de l'obésité. Les politiques répondant à la croissance de l'obésité et ne se concentrant que sur les interventions individuelles plutôt que de reconnaître le rôle des tendances de comportements sociaux et de l'environnement quotidien n'engendreront pas les changements globaux nécessaires.

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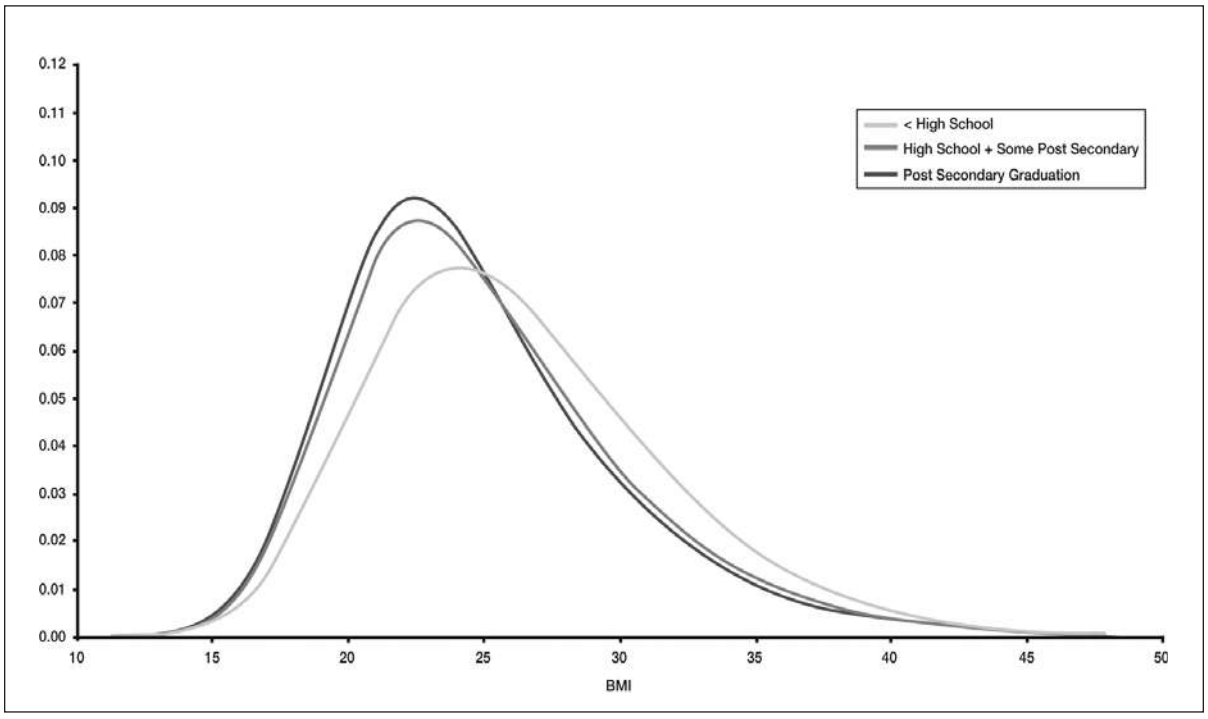
There is consistent evidence that the prevalence of overweight and obesity are increasing rapidly around the world in both developing and developed countries, including Canada (Katzmarzyk and Ardern, 2004; Huot, et al., 2004; WHO, 2004; Torrance et al., 2002; WHO, 1998; Macdonald et al., 1997). The prevalence of combined overweight and obesity (BMI 25) in Canada increased from 48% to 57% among men and from 30% to 35% among women between 1981 and 1996 (Tremblay et al., 2002). This is worrisome because overweight and obesity are linked to serious health problems like heart disease, diabetes, some cancers and, depending on which of the large scale studies you believe from the United States, early death. The speed of the rise in obesity suggests that, rather than a shift in the genetic composition of the population, the root of the obesity pandemic in countries like Canada is an environment that supports obesity (Egger and Swinburn, 1997; Hill and Peters, 1998; Poston and Foreyt, 1999).

Obesity and overweight are caused by many factors, including genes, metabolism, food intake, and the level of physical activity. Further "upstream", if you like, are socioeconomic, cultural, and environmental factors which influence behaviour and, in turn, weight gain. Consider, for example, the distribution of Canadian women's body mass (as measured by the body mass index or BMI, calculated as body mass in kilograms divided by height in metres, squared) by education level (Figure 1). The distribution of BMI for women who did not graduate from high school peaks closer to 25 (the World Health Organization's cutpoint for overweight) and bulges over to the right, reflecting higher proportions of women without high school education in the overweight and obese (BMI 30) ranges. By contrast, women with a post secondary education are much more likely to have a BMI in the normal range (18-24).

How is it that this one social characteristic has such a "pull" on a health outcome like body weight? What might be the mechanisms behind the association between education and overweight? It could be that teenage girls who have children before graduating from high school have the potential for more births and more weight gain over their life time. But the answer is probably far more complicated and likely has to do with mundane contrasts in the everyday lives of women with and without higher education. Food choices and body images reflecting social class identity, time and safe places for recreation are likely all implicated and the list could go on. Regardless of the precise mechanism, if we take the relationship between education level and body weight to be causal for women, and of course we are never supposed to infer that from cross sectional pictures like that of Figure 1, it would follow that an excellent population-level intervention for obesity and overweight is to keep girls in school. Make sure they finish high school and, better yet, it would be great if they went on to post-secondary education. This strategy, at a population level, would be better than promoting stomach-stapling surgery. This would arguably be more effective than messages, aimed at individuals, to eat better and exercise more after they are already overweight or obese. It is notoriously difficult to change human behaviour and extremely hard to lose weight and keep it off. We know from a recent study that followed Canadians for eight years that a full 25% of us who had been overweight in 1994 had become obese by 2002. Only 10%, who had been overweight at the outset of the study were in the normal weight range eight years later (LePetite and Berthelot, 2005).

If we go even further upstream to look at some environmental roots of overweight and obesity we should begin to consider our taken-for-granted design features of contemporary urban environments. There are wide variations across neighbourhoods in the availability of recreational opportunities and access to fresh, healthy foods. There is an entire literature on "food deserts" or the systematic absence of affordable healthy foods in poor inner city neighbourhoods. Fast-food, however, tends to be cheap and plentiful, setting up a paradox whereby the predictors of food insecurity are often the same as the predictors of obesity.

Figure 1: Distribution of Body Mass Index (BMI) by Level of Education, Canadian Women aged 20-64 years, 2000/01 Canadian Community Health Survey



Graph produced, with thanks, by Saeeda Khan.

Modern suburban neighbourhoods characterised by work, school, and commercial land uses that are not easily accessible on foot or by bike restrict the amount of time people spend walking or cycling for utilitarian purposes. In fact it has been shown by several researchers that levels of physical activity among people living in sprawling neighbourhoods tend to be lower than those living in higher density, more-compact neighbourhoods (Ewing et al., 2003; Frank et al., 2003; 2005; Frumkin, 2002; Jackson, 2003; Saelens et al., 2003). Frank et al. (2004) demonstrated that the mean BMI for men went down significantly across neighbourhoods as land use mix, density, and street connectivity increased. While this research is mainly from the United States, we now know that the sprawl-obesity link exists for Canadian men as well (although the relationship is not significant for women). While the average male in urban Canada already has a BMI score in the overweight range (~26), an inactive, married man, under high stress and living in a sprawling metropolis has a hypothetical BMI over 27, inching ever closer to the obese range of BMI (Ross et al., 2006). Know anyone who fits that profile?

Historically, strategies to protect population health that have been most effective have addressed structural features of the environment. Consider the improvements in sanitation and housing conditions in the 19th century industrial city that led to vast increases in urban life expectancy. Or, consider the broad sweeping changes in social norms and legislative changes restricting smoking in public places that were responsible for the decline in smoking rates in most jurisdictions across North America in the late 20th century. It is time for the public health debate on obesity to learn from its past successes and better understand and respond to our obesogenic environments.

References

Egger G, Swinburn B. An Ecological Approach to the Obesity Pandemic. BMJ 1997;315:477-480.

Ewing R, Schmid T, Killingsworth R, Zlot A, Raudenbush S. Relationship Between Urban Sprawl and Physical Activity, Obesity and Morbidity. Am J Health Promot. 2003;18:47-57.

Frank LD, Andresen MA, Schmid TL. Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars. Am J Prev Med. 2004;27:87-96.

Frank LD, Engelke PO, Schmid TL. Health and Community Design: The Impact of the Built Environment on Physical Activity. Washington: Island Press; 2003.

Frumkin H. Urban Sprawl and Public Health. Public Health Rep. 2002;117:201-217.

Hill JO, Peters JC. Environmental Contributions to the Obesity Epidemic. Science. 1998; 280:1371-1374.

Huot I, Paradis G, Ledoux M. Factors Associated with Overweight and Obesity in Quebec Adults. Int J Obes Relat Metab Disord. 2004;28:766-774.

Jackson RL. The Impact of the Built Environment on Health: An Emerging Field. Am J Public Health. 2003;93:1382-1384.

Katzmarzyk PT, Ardern CI. Overweight and Obesity Mortality Trends in Canada, 1985-2000. Can J Public Health. 2004;95:16-20.

Katzmarzyk PT. The Canadian Obesity Epidemic 1985-1998. CMAJ. 2002;1666:1039-1040.

Lepetit C, Berthelot J-M. Obesity: A Growing Issue. Health Reports 2006;17:12-18.

Macdonald SM, Reeder BA, Chen Y, Despres JP. Obesity in Canada: A Descriptive Analysis. Canadian Heart Health Surveys Research Group. CMAJ. 1997;157(Suppl 1): S3-S9.

Poston WSC, Foreyt JP. Obesity is an Environmental Issue. Atherosclerosis. 1999;146:201-209.

Ross NA, Tremblay S, Khan S, Crouse D, Berthelot J-M, Tremblay M. Body mass index in urban Canada: Neighbourhood and metropolitan area effects. Am J Public Health (forthcoming 2006).

Saelens BE, Sallis JF, Black JB, Chen D. Neighborhood-based Differences in Physical Activity: An Environment Scale Evaluation. Am J Public Health. 2003;93:1552-1558.

Torrance GM, Hooper MD, Reeder BA. Trends in Overweight and Obesity Among Adults in Canada (1970-1992): Evidence from National Surveys Using Measured Height and Weight. Int J Obes Relat Metab Disord. 2002;26:797-804.

Tremblay MS, Katzmarzyk PT, Willms JD. Temporal Trends in Overweight and Obesity in Canada, 1981-1996. Int J Obes Relat Metab Disord. 2002;26:538-543.

World Health Organization. Global Strategy on Diet, Physical Activity and Health. Geneva; 2004.

World Health Organization. Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation on Obesity. Geneva; 1998.