

Table 1: Prevalence of overweight and obesity among Canadian children aged 7 to 13 years, calculated using 2 methods

| | Prevalence (%) calculated by method 1* | | Prevalence (%) calculated by method 2† | |
|---|--|---------|--|---------|
| | Overweight | Obesity | Overweight | Obesity |
| 1981 Canada Fitness Survey | | | | |
| Boys | 15.0 | 5.0 | 10.6 | 2.0 |
| Girls | 15.0 | 5.0 | 13.1 | 1.7 |
| 1996 National Longitudinal Study of Children and Youth | | | | |
| Boys | 35.4 | 16.6 | 32.6 | 10.2 |
| Girls | 29.2 | 14.6 | 26.6 | 8.9 |

*Arbitrary definitions of overweight and obesity were used, which were the age- and sex-specific 85th and 95th percentiles of the 1981 Canada Fitness Survey.¹

†The derived cut-offs for overweight and obesity, based on LMS regression from the adult health-related definitions of 25 kg/m² and 30 kg/m², were used.²

obesity calculated using the adult health-related definitions are lower than the arbitrarily defined values of 15% and 5% (Table 1). In fact, the prevalence of obesity is less than half of 5% in both boys and girls. The prevalences of obesity in the 1996 National Longitudinal Study of Children and Youth are also somewhat lower than those reported by Tremblay and Willms.

The trends for overweight and obesity among Canadian children determined using the new health-related international cut-offs are the same as those reported by Tremblay and Willms, but use of these cut-offs will better allow comparisons to be made between countries and between children and adults.

I thank Cora Craig and her colleagues at the Canadian Fitness and Lifestyle Research Institute for providing data from the 1981 Canada Fitness Survey, and Lecily Hunter of the National Longitudinal Study of Children and Youth Project, Special Surveys Division, Statistics Canada, for providing data analyses on the National Longitudinal Study of Children and Youth master file.

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[The authors respond:]

We believe that there is little to be gained by arguing with Roland Auer and colleagues about whether diet or physical inactivity is the most important variable leading to obesity in Canadian children: together these factors determine caloric balance and therefore both are important. We advocated both healthy nutrition and physical activity throughout our paper.¹ The “massive caloric intake we ‘enjoy’” is a problem only if we do not counter it with a proportional increase in physical activity. The comment by Auer and colleagues that “most data suggest that energy intake has increased over the past several decades” is perhaps based on selective information.^{2,3} Also, increasing energy expenditure produces multiple physiological and psychological benefits beyond maintaining caloric balance^{4,5} and these effects should not be ignored. Finally, significant problems exist in assessing physical activity and energy intake, and current techniques are clearly

inadequate. The leap of faith required to accept “energy availability”⁶ as a legitimate surrogate for energy intake is large.

In response to Murray Finkelstein, in our study we used data derived from stratified random samples of the Canadian population.¹ The sample designs, which are typical of surveys conducted by Statistics Canada, oversampled respondents in the smaller provinces, such that reasonably accurate estimates of provincial statistics can be obtained. Our analyses used the design weights provided by Statistics Canada, which take into account the stratified sampling design as well as potential bias due to nonresponse.⁷ Finkelstein’s point regarding sampling variances may be valid, however, in that the sample of children for the National Longitudinal Study of Children and Youth was clustered within families, with up to 2 children sampled within each family. In our subsample, for example, about 40% of the children were members of a sibling pair. We estimated the sampling variances using hierarchical linear models to achieve more accurate estimates of the standard errors and found that they increased by only about 5% when within-family clustering was taken into account. We agree that this more complex approach is preferable, but note that its use has no appreciable effect on our results or conclusions. The bootstrap method suggested by Finkelstein is computationally intensive and has some undesirable properties. For surveys such as these, which are derived from stratified samples and where individuals are clustered within higher level units such as families or schools, approaches based on balanced repeated replications provide a simple, robust approach to estimate sampling variances⁸ and are generally preferable to bootstrap techniques.⁹

We estimated secular changes in the prevalence of overweight and obesity using well-established guidelines.¹⁰⁻¹² Peter Katzmarzyk suggests using new guidelines to define overweight and obesity¹³ that were published after our paper had been submitted to *CMAJ*. We agree with Katzmarzyk about the

value of these new definitions. We believe the important finding in our study is that the prevalence of childhood overweight or obesity, however defined, is increasing rapidly. Katzmarzyk points out that when using the method proposed by Cole and colleagues,¹³ the magnitude of the problem may be smaller than we reported, but the rate of change of the problem may in fact be larger than we reported. Difficulties in establishing acceptable definitions for childhood overweight and obesity are not new.¹⁴ The findings in Katzmarzyk's letter will facilitate future research in this area.

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[The commentator responds:]

Roland Auer and colleagues assert that when attempting to explain the current increase in the prevalence of obesity, "the exercise factor must pale when compared with the massive caloric intake we 'enjoy' in Canada." Excess energy intake is no doubt a contributing factor to the increasing girth of Canadian youth. However, to contend that the increasing prevalence of obesity is solely due to gluttony may oversimplify this complex problem.¹ For example, Prentice and Jebb reported that the prevalence of obesity doubled from 1980 to 1990 in Britain.² During this time, energy intake declined substantially; the implication is that levels of physical activity, and hence energy needs, declined even faster. Interestingly, these authors reported that the changing prevalence of obesity was tightly related to sedentariness, hours of television watched and the number of cars per household; they concluded that inactive lifestyles are at least as important as diet in causing obesity, and possibly represent the dominant factor.² Physical inactivity also may be a cue for eating in some children. My colleagues and I recently reported that US children who watch 5 or more hours of television per day consume 175 kcal/d more than those who watch at most 1 hour per day.³

Auer and colleagues also note that chronic caloric restriction has been demonstrated to increase longevity in other species. Translating findings in animal models to humans remains problematic. Most people have difficulty maintaining even a moderately restricted diet for any length of time.

Physicians must understand that obesity is caused by a complex interaction of genetics, diet, activity levels and behaviours. Long-term weight management will likely be achieved in overweight patients who learn to set realistic goals, change the behaviours that have led them to become overweight, increase their levels of physical activity and simultaneously engage in sound dietary practices.

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D is for drug addiction—and disability

The *CMAJ* editors deserve praise for their searing editorial on the Ontario government's plan to implement mandatory drug testing for welfare recipients.¹ The editorial states (sarcastically) that "Only those with a gift for illogic would question the extension of the drug testing program to people on disability assistance whose only disability is drug addiction." The Ontario government need not worry. Under the Ontario Disability Support Program Act, 1997, people are not recognized as having a disability if they are addicted and the only substantial reduction in activities of daily living is due to the use of the addictive substance. A diagnosis of a substance-related disorder by a medical practitioner does not constitute a "substantial mental or physical impairment" under the Act. According to the Ontario plan, the government