## HEALTH POLICY AND ECONOMICS

# Obesity: Implications for Health Care and Society

Jennifer L. Braun, BSc (Hons)
Bryan A.A. Heal, BSc (Hons)

## ABSTRACT

Over a third of adult Canadians are currently at increased risk of chronic morbidity and premature death due to conditions associated with excess body weight. Obesity rates among youth have more than tripled since 1981 to currently represent more than 15% of all Canadian children and adolescents.[1,2,3] In the context of established trends such as increased television consumption, reduced physical activity, and the ubiquity of fast food diets, a record number of children face the grave risk of a morbidly obese future. The consequences of this trend impact the population on multiple levels. For one, obesity – the number two risk factor for cardiovascular disease – also correlates strongly with increased risks of diabetes, cancers and other debilitating chronic conditions; moreover, it has the potential to reverse progress made in other health and development indicators, such as life expectancy at birth. Health care systems, already struggling to meet demands, may one day face a sustained spike in user requests when these obese children grow well into their adult years. To maintain adequate resource capacity, policy changes coinciding with effective prevention campaigns aimed at fostering healthy living, are required. Some recommendations are provided herein, but greater public interest and vital political will is needed.

## INTRODUCTION

In the Canadian public health arena, the last 50 years have been witness to a host of non-communicable conditions replacing many infectious diseases as health care's primary concern. Currently receiving a lot of media attention is the increasingly sedentary lifestyle of North Americans. High television ratings, video game sales and increasing computer usage, among other factors, help account for trends of physical inactivity among adults and their children.[4,5] Compounding the problem of inactivity is that fast foods have become a mainstay of the North American diet, replacing more nutritious eating habits. As a result of these changes in lifestyle, obesity rates – both a national and global concern – will continue to rise, impacting on existing health care systems due to increases in the frequency and severity of debilitating chronic and/or fatal conditions such as diabetes, cardio- and cerebrovascular disease.[2,6-11]

In recent years, most indicators have pointed to better health and longer average life spans in industrialized countries than ever before.[1,2,6-12] Canada has followed this trend, reporting a record life expectancy at birth of 79.2 years in 2003.[12] Much of the credit for this is ascribed to improvements in science, medicine and technology. What is worrisome, however, is that current demographic trends may soon have an impact on life expectancy rates, thus limiting much of the progress made in the past half century. With respect to obesity, for example, it is well documented that many gains in fighting heart disease, diabetes and several forms of cancer will suffer regression if the obesity epidemic is not adequately addressed.[9] Child and youth obesity rates continue to reach record levels, and without greater prevention efforts, health care systems will not have the capacity to address the needs of future populations.

### The Problem

Cardiovascular morbidity, diabetes and cancers already represent substantial burdens on the health care system, and some predict that these will be the "big three" non-communicable diseases of the future. These three have particularly affected the industrialized world, severely impacting human health, and exposing the limits of current health care practices.[2,6,13,14] As of 1999, approximately 1 in 3 adult Canadians suffered an increased risk of premature mortality or a combination of the following conditions due to excess body weight: cardiovascular disease (CVD), type-2 diabetes, stroke, hypertension, dyslipidemia, gallbladder disease, mental anxiety and various forms of cancer.[2,15-23] As of 2000, approximately 10% of all mortality among those aged 20-64 is attributable to being overweight and obesity.[24] Between 1994-2001, the number of obese adults in Canada, indicated by a body mass index (BMI) of 30 or

higher, rose from roughly 500,000 to almost 2.8 million, or approximately 15% of the total adult population.[1,2] A study on economic impacts of obesity in Canada conservatively estimates that the cost of obesity exceeds $1.8 billion, or 2.4% of all annual health care expenditures for disease.[2] This, along with a 2000-2001 survey indicating that 3.2 million, or 1 in 10 Canadians had unmet health care needs,[1] confirms that obesity in Canada is helping strain the system beyond its limits.

As the aforementioned "big three" represent predominantly lifestyle diseases, increased prevention must become a priority. Though each has an identified genetic component, they can often be adequately controlled by healthy day-to-day habits including regular exercise and a proper diet.[2,6,7] Obviously, if preventative measures are not improved over the immediate next decades, our health care system will become increasingly overburdened, putting further financial strain on already taxed governments. Indeed better prevention has *long* been promoted by health professionals and most recently, by extensive media coverage inspired by new research and renewed anti-obesity agendas undertaken by large public health organizations such as the World Health Organization and the US Center for Disease Control and Prevention. In addition to the media blitz about an obesity epidemic, overweight or 'at-risk' patients followed regularly by their family physicians are warned of potential health implications and encouraged to lead healthier lifestyles, all of which contribute to an improved general awareness of obesity-related consequences.

Countering these gains, however, are aggressive marketing campaigns by manufacturers of nutrient-poor foods and products associated with physical inactivity. Beyond advertising, artificial and junk foods are often priced lower than healthy eating options, making them a more convenient purchase for an individual or family on a limited financial budget. As obesity rates have continued to rise, preventative measures currently in place have been ineffective in countering external environmental pressures pushing the epidemic forward. In its most recent systematic review of interventions for preventing childhood obesity, the Cochrane authors assessed all programs targeting diet, lifestyle and physical activity concerning obesity between 1985-mid 2001, and inferred that no concrete conclusions could be drawn on the effectiveness of such programs as little quality evaluative data exists.[25] A recent roundtable discussion on Obesity in Canada confirmed this conclusion by expressing concern for the lack of available evidence on the impact of interventions on obesity.[26]

Children that grew up in the 1970s may be thought of as the inaugural fast food generation, the first group raised in an environment of ubiquitous and highly successful fast food marketing.[27,28] In 2004, this fast food culture is so deeply entrenched as to be the norm. Combine this with increased access to physically inactive recreational choices, and an environment that virtually encourages obesity is created. Both childhood and young-adult obesity rates support these statements; the prevalence of child (aged 7-13 years) obesity continues to rise steadily, having already more than tripled from 5% of boys and girls in 1981, to 17% of boys and 15% of girls in 1996.[1,2,3] Furthermore, it is well documented that overweight and obese children will likely remain overweight or obese throughout adulthood, severely impacting upon quality as well as length of life.[3,6-9,13,29-31]

As today's youth age, their latter years will be much different than those of the current population of senior citizens. At present, a newborn Canadian has a life expectancy of 79.2 years[1] – a statistic based largely upon history, environmental conditions and scientific progress.[12] Though there are exceptions, this mean age is likely to be met or exceeded by those in good health within an ideal weight range for their height. Correlations between child, adolescent and adult obesity with mortality indicate a substantial reduction in life expectancy when compared to the rest of the population.[2,8-11,13,29-31] Large scale, long-term monitoring studies of obese populations have inferred life expectancy reductions in the 13 year range.[8,9] When controlled for factors such as gender or smoking habits, individuals with a BMI of at least 30 continued to show a mean reduction in life expectancy of 7 years, and the probability of premature death has been demonstrated to increase with each unit of increase in BMI.[8]

As mentioned previously, obesity has risen to the number two risk factor for cardiovascular disease, and becomes number one when considered in combination with cigarette smoking.[23] While other leading risk factors such as genetics cannot be modified, it is possible for smoking and obesity to be addressed through preventative measures based on lifestyle and environmental channels. Aggressive anti-tobacco education and advertising, in combination with inflated taxes on cigarette purchases, have contributed to reductions in smoking rates, especially among youth.[32,33] Though fast food, physical inactivity and certain advertising to children continue to feed the obesity epidemic, comparable campaigns to the tobacco fight have yet to be attempted in Canada against any of these factors.

## CONSEQUENCES OF INACTION

When predicted years of life lost due to obesity are measured against normal life expectancy levels, an obese Canadian child or youth may have an adjusted life expectancy of approximately 66 years.[1,8,9,12] The generation of the 1990s previously discussed will reach 65-70 by 2055-2065. If trends continue unimpeded, from these years onward the health care community will face a 'double cohort' of sorts, forced to accommodate significant numbers of patients from two different generations, each experiencing end stage complications. The population of elderly people in their 80s and 90s will be admitted as expected; however, they may be joined by record numbers of those in their 60s and 70s entering for end stage conditions associated with obesity. Should lifestyle changes not occur in young adult and child populations, and effective upgrades to care capacity and treatment options fail to be undertaken, current population trends will lead to one or more of the following consequences: (1) average lifespan and life expectancy rates will fall (discussed previously); (2) average quality of life will suffer with the increased risk of chronic disease and anxiety; and (3) further financial and logistical strains on our health care

system will ensue. While improved therapeutics will no doubt continue to be introduced, such strains will still prove significant without additional resources to handle a large increase in obesity related conditions in addition to a more numerous elderly population. If sufficient emergency funds are required, the unsavoury prospect of significant cuts to other sectors and social services looms large. This may not come to pass for many decades, therefore time remains for prevention efforts and improvements to services to adequately accommodate projected increases in need.

## WHAT CAN BE DONE?

While innovative new anti-obesity strategies are required, perhaps a first step could build on conclusions from the Round Table Discussion on Obesity in Canada, and increase investment in program evaluations, which could facilitate the direction of limited resources toward those programs deemed successful. Development of pharmaceutical therapies must continue to be emphasized, and exist alongside innovative health legislation to curb emergent trends. Political resolve should be committed to employing a two-front approach, aimed firstly, at the implementation of effective policy and prevention campaigns to prevent weight gain, foster weight loss and prevent the re-gain of weight sucessfully lossed.[34] Secondly, these programs must complement gradual, smart and progressive upgrades to health care system capacity resources. Some of these initiatives are already underway as federal, provincial and territorial governments are currently working together to develop a Pan-Canadian Living Strategy to fight obesity and other major non-communicable diseases, which calls for innovative policy development, knowledge transfer, community development, infrastructure and public involvement.[26,34]

Increased funding for health care is currently at or near the top of priority lists for all levels of government, which is an encouraging sign. The World Health Organization has called for broad legislative measures in their most recent draft policy on diet, physical activity and health, the most controversial of which is a proposed "fat-tax" intended to limit the consumption of food with high fat, salt and/or sugar content.[34] While Canada has yet to declare a position on this matter, the idea of adopting pricing policies to affect consumption is not new as many nations have effectively altered consumption trends in this manner.[35,36,37] A combination of taxing 'bad' foods, subsidising healthy foods and providing cash transfers (similar to GST-rebates) to low-income families to improve food purchases is likely to increase public practices associated with healthy eating. From a public health perspective the largest concern associated with a "fat-tax" appears to be the impact that rising food prices will have on low-income earners already struggling with day-to-day living. However, if curbing obesity rates is a priority issue, then a combination of effective marketing along with new pricing policies appears to be an excellent next step and a recommendation that should be taken very seriously. Taxing foods with high fat, sugar and salt contents will likely generate positive results; however, if such measures are taken they must co-exist with comparable rebates or other financial incentives to assist low-income families already struggling with the cost of food. To compensate for potential lost business revenue, extra cash levied from new taxes could be used to provide rebates and financial incentives for industry and manufacturers to provide and market healthier eating options.[34]

Any new pricing policy, however, must be well planned and piloted, as was learned from the withdrawn food tax proposed by the Provincial Government of Ontario in early 2004, which called for extending the 8% provincial sales tax to all food purchases under four dollars. It did not specifically target items of poor nutritional quality, and no financial assistance was provided for low income earners or businesses anticipating lost revenue. These criticisms and others led to a public perception of the tax as strictly a cash grab, with little intent of fostering healthier eating habits. In a separate initiative, the incumbent Liberals also pledged to remove junk food vending machines from all schools. While such machines remain at the high school level, their movement may claim a partial victory as the Canadian soft drink industry has voluntarily agreed to withdraw carbonated beverages from all primary and middle schools in Canada by September 2004.

Other possible steps toward obesity prevention include passing legislation limiting marketing to children, allowing only those advertisements which pass a public health review board, an old idea which has previously been met with little success. While the Federal Government reformed the labelling of food items in 2003 with the introduction of standard Nutrition Facts tables to help individuals understand the nutritional content of food purchases, its effectiveness remains unclear and evaluative studies should be performed in the near future. Increased physical activity, especially in schools, should also be aggressively promoted through a curriculum with more mandatory physical education and fitness classes; more active adult lifestyles could also be promoted by making cities friendlier to cyclists and less convenient to automobile owners where public transit is accessible. Admittedly, each of these suggestions must be examined more thoroughly for cost-effectiveness and feasibility within the frameworks of current government mandates and commercial targets. Whether these or others are implemented, creative strategies must continue to be developed from collaborations between communities, governments, industry, health professionals and other interested parties.

### Conclusion

Non-communicable diseases, such as those associated with obesity, have proven to be a great challenge and require a creative imagination to control.[6] The growing epidemic has already reached record levels, driving the increases in numerous adverse health conditions, premature mortality, and augmented burden on health care systems. Curbing trends of rising obesity rates, particularly among youth, must be a priority. For this to occur there needs to be both strong public interest and rigorous political will to carry out aggressive education, prevention and healthy-living campaigns. Preventative efforts must co-exist alongside advances in medical research and progressive reforms in order to accommodate a potentially massive

increase in the number of health care users in the coming decades. Time is currently on our side, in terms of implementing reform and policies geared toward averting the potential downstream health care disaster; however, immediate joint actions from all levels of society must be initiated.

## AUTHOR BIOGRAPHIES

*Bryan A. A. Heal completed his Hon. B.Sc. in Biology at McMaster University, where he is currently a research assistant for the School of Nursing.*

*Jennifer L. Braun is currently completing year one of medical school at McMaster University. She holds an Hon. B.Arts.Sc., also from McMaster.*

## REFERENCES


1. Statistics Canada. (2003). How Healthy are Canadians? Annual Report 2003. Health Reports Supplement. Retrieved January 21, 2004, from the World Wide Web:http://www.statcan.ca/english/freepub/82-003-SIE/82-003-SIE2003000.htm .
2. Birmingham CL, Muller JL, Palepu A, *et al*. (1999). The cost of obesity in Canada. *CMAJ*. 160:483.
3. Tremblay MS., Williams JD. (2000). Secular Trends in the Body Mass Index of Canadian Children. *CMAJ*. 163(11)14-29.
4. Tremblay MS., Willms JD. (2003). Is the Canadian childhood obesity epidemic related to physical inactivity. *Int. J Obes Relat Metab Disord*. Sept; 27(9); 1100-5.
5. Fotheringham MJ., Wonnacott RL., Owen N. (2000). Computer use and physical inactivity in young adults: public health perils and potentials of new information technologies. *Ann Behav Med*. Fall; 22(4): 269-275.
6. World Health Organization. (2003). World Health Report 2003. Retrieved January 11, 2004, from the World Wide Web: http://www.who.int.
7. World Health Organization. (2003). Diet, Nutrition and the Prevention of Chronic Disease. WHO Technical report series. Retrieved Janueary 11, 2004, from the World Wibe Web: http://www.who.int/nut/documents/trs_916.pdf.
8. Peeters A, Barendregt JJ, Willekens F, *et al*. (2003). Obesity in adulthood and its consequences for life expectancy: a life-table analysis. *Annals of Internal Medicine*. 138:24-32.
9. Fontaine KR, Redden DT, Wang C, *et al*. (2003). Years of life lost due to obesity. *JAMA*. 289(2):187.
10. Jeffreys M, McCarron P, Gunnell D, *et al*. (2003). Body mass index in early and mid-adulthood, and subsequent mortality: a historical cohort study. *Int J of Obes*. 27(11): 1391-7.
11. Hoffmans MDAF, Kromhout D, de Lezenne Coulander C. (1998). The impact of body mass index of 78,612 18-year old Dutch men on 32-year mortality from all causes. *J Clin Epidemiol*. 41:749–756.
12. United Nations Development Programme. (2003). Human Development Report 2003: Millennium Development Goals: A compact among nations to end human poverty. Retrieved December 28, 2003, from the World Wibe Web: http://www.undp.org/hdr2003/,
13. Engeland A, Bjørge T, Søgaard AJ, *et al*. (2003). Body mass index in adolescence in relation to total mortality: 32-year follow-up of 227,000 Norwegian boys and girls. *Am J Epidemiol*. 157:517–523.
14. Wang G, Zheng ZJ, Heath G, *et al*. (2002). Economic burden of cardiovascular disease associated with excess body weight in U.S. adults. *Am J Prev Med*. 23(1); 1-6.
15. Willett WC, Manson JE, Stampfer MJ, *et al*. (1995). Weight, weight change, and coronary heart disease in women: risk within the "normal" weight range. *JAMA*. 273:461-5.
16. Rimm EB, Stampfer MJ, Giovannucci E, *et al*. (1995). Body size and fat distribution as predictors of coronary heart disease among middle-aged and older US men. *Am J Epidemiol*. 141:1117-27.
17. Rabkin SW, Chen Y, Leiter L, *et al*. (1997). Canadian Heart Health Surveys Research Group. Risk factor correlates of body mass index. *CMAJ*. 157:S26-S31.
18. Rexrode KM, Hennekens CH, Willett WC, *et al*. (1997). A prospective study of body mass index, weight change, and risk of stroke in women. *JAMA*. 277:1539-45.
19. Colditz GA, Willett WC, Rotnitzky A, *et al*. (1995). Weight gain as a risk factor for clinical diabetes mellitus in women. *Ann Intern Med*. 122:481-6.
20. Stampfer MJ, Maclure KM, Colditz GA, et al. Risk of symptomatic gallstones in women with severe obesity. *Am J Clin Nutr*. 55:652-8.
21. Sellers TA, Kushi LH, Potter JD, *et al*. (1992). Effect of family history, body-fat distribution, and reproductive factors on the risk of postmenopausal breast cancer. *N Engl J Med*. 326:1323-9.
22. Lee MI, Paffenbarger RS Jr. (1992). Quetelet's index and risk of colon cancer in college alumni. *J Natl Cancer* Inst. 84:1326-31.
23. Health Canada. (2004). Cardiovascular Disease Surveillance On-Line. Population and Public Health Branch, Health Canada. Retrieved March 12, 2004. from World Wide Web: http://dsol-smed.hc-sc.gc.ca/dsol-smed/cvd/index_e.html
24. Katzmarzyk PT., Ardern CI. (2004). Overweight and obesity mortality trends in Canada, 1985-2000. *Can J Public Health*. 95(1):16-20.
25. Campbell K., Waters E., O'Meara S., Kelly S., Summerbell C. (2004) Interventions for preventing obesity in children (Cochrane review). The Cochrane Library, Iss2. John Wiley & Sons, Ltd. Chichester, UK.
26. Canadian Institute for Health Information. (2003). Obesity in Canada, Identifying Policy Priorities: Proceedings of a Roundtable. Retrieved April 22, 2004 from world wide web: http://secure.cihi.ca/cihiweb/products/CPHI_proceed_e.pdf
27. Boynton-Jarrett R, Thomas TN, Peterson KE, *et al*. (2003). Impact of television viewing patterns on fruit and vegetable consumption among adolescents. *Pediatrics*. 112(6 Pt 1):1321-6.
28. Schwartz MB, Puhl R. (2003). Childhood obesity: a societal problem to solve. *Obes Rev*. 4(1):57-71.
29. Engeland A., Bjorge T., Tverdal A., *et al*. (2004). Obesity in Adolescence and Adulthood and the Risk of Adult Mortality. *Epid*. 15(1):79-85.
30. Dietz WH. (1998). Health Consequences of Obesity in Youth: Childhood Predictors of Adult Disease. *Pediatrics*. 101:518.
31. Freedman DS., Khan LK., Dietz WH., *et al*. (2001). Relationship of Childhood Obesity to Coronary Heart Disease Risk Factors in Adulthood: The Bogalusa Heart Study. *Pediatrics*. 108(3):712.
32. Campaign for Tobacco-Free Kids. (2004). Raising cigarette taxes reduces smoking, especially among kids. Fact Sheet 0164, retrieved March 12, 2004 from World Wide Web: http://tobaccofreekids.org/research/factsheets/pdf/0146.pdf
33. Ross H., Chaloupka FJ. (2003). The effect of cigarette prices on youth smoking. *Health Econ*. Mar;12(3):217-30.
34. Strychar, I. (2004). Fighting Obesity: A Call to Arms. *Can J Public Health*. 95(1):13-14.
35. World Health Organization. (2003). Integrated prevention of non-communicable diseases: Draft global policy on diet, physical activity and health. Retrieved March 09, 2004 from World Wide Web: http://www.who.int/gb/EB_WHA /PDF/EB113/eeb11344a1.pdf
36. Guo X., Popkin BM., Mroz TA., Zhai F. (1999). Food price policy can favourably alter macronutrient intake in China. *J Nutrition*. May;129(5):994-1001.
37. *French SA. (2003). Price effects on food choices. J* Nutrition. Mar;133(3):841S-843S.