# BACKGROUNDER:
# DIET-RELATED DISEASES AND HEALTHY EATING

Diet-related diseases are a leading cause of death in Canada, costing our healthcare system tens of billions of dollars each year. These diseases are largely avoidable and can often be prevented through the adoption of a healthy diet and lifestyle.

The World Health Organization lists diabetes, cardiovascular disease, cancer, obesity, osteoporosis, and dental disease as major diet-related diseases.[1] These illnesses are caused in large part by unhealthy diet and lifestyle factors and are, in some cases, becoming epidemic. More than 90% of type 2 diabetes, 80% of heart disease, 70% of stroke, and 70% of colon cancer cases could be prevented through changes to diet and lifestyle.[2] It is imperative that government, community groups, schools, and other stakeholders create healthy and equitable food environments to prevent and address diet-related diseases.

### Diabetes

Diabetes, a group of diseases that affect blood sugar levels, is responsible for nearly three per cent of deaths in Canada.[3] The rate of diabetes is fast increasing: 11 million Canadians (29%) were living with diabetes or preu diabetes in 2016, and this number is projected to rise to almost 14 million by 2026.[4] Canada has one of the highest prevalence rates of diabetes among all OECD countries.[5] Diabetes does not impact everyone in Canada equally: people who are immigrants to Canada, those living on low incomes, and Indigenous peoples are disproportionately affected. The prevalence of diabetes is estimated to be three times higher in among Indigenous populations compared to the general population.[6]

Type 1 diabetes, which accounts for five to ten per cent of diabetics, results from the immune system attacking the pancreas, restricting the release of insulin in the body, and preventing blood sugar from being used as energy. Treatment depends on insulin and is better managed with healthy eating. [7]

The vast majority of diagnoses, however, are of type 2 diabetes, which results from the body's improper use or creation of insulin. Type 2 diabetes can be managed through diet and exercise but may

also require the use of medication and insulin.[8] It is estimated that over half of type 2 diabetes diagnoses could be prevented or delayed by healthy eating and exercise.[9] Once seen as a disease that mainly affects adults, type 2 diabetes is increasingly being diagnosed in children.[10] Low-income Canadians are four times more likely to suffer from type 2 diabetes.[11]

A third type of diabetes, gestational diabetes, is temporary, occurring during pregnancy and leading to increased risks of diabetes in both mother and child.[12]

Diabetes cost Canada's health care system and economy $11.7 billion in 2010, and is expected to cost $16 billion annually by 2020.[13] Health care costs are more than double for Canadians with diabetes: an Ontario study found that average health care spending for a person with diabetes was $16,000 compared to $6000 for a person without.[14]

### Cardiovascular disease

Cardiovascular diseases (CVD) are diseases that affect the heart and blood vessels, including ischemic, rheumatic and congenital heart disease, stroke, vascular disease, and heart failure.[15]

- *Ischemic heart disease (coronary heart disease)* is the most common type of cardiovascular disease. It involves complications with blood circulation to the heart; severe cases can lead to heart attacks.
- *Stroke (cerebrovascular disease)* involves complications with blood circulation to the brain.
- *Peripheral vascular disease* involves complications with blood circulation, generally to the legs.
- *Heart failure* occurs when the heart is unable to pump sufficient blood for the body.
- *Rheumatic heart disease* starts in childhood as an infection and can cause heart problems later in life.
- *Congenital heart disease* is a heart problem caused by a birth defect.[16]

2.4 million adults in Canada (one in 12) live with diagnosed CVD.[17] Despite a sharp decline in CVD mortality rates in recent decades[18]—likely due to better prevention, diagnosis, treatment and management[19]—they are still a leading cause of death and hospitalization[20], accounting for 25 per cent of deaths in Canada in 2013 (20 per cent from heart disease and 5 per cent from stroke).[21]

Nine out of ten Canadian adults demonstrate at least one CVD risk behaviour.[22] Diet-related contributors to CVD development include inadequate fruit and vegetable consumption, excess sodium, and diet-related diseases, such as obesity and diabetes.[23] Certain populations in Canada are more at risk for CVD: Canadians living on low incomes are twice as likely to have cardiovascular disease compared to people with higher incomes.[24]

Despite the recent downtrend in CVD rates, costs are projected to rise due to an aging population and rising indirect costs. CVD cost Canadians $20.9 billion in 2005, and costs are expected to reach $28.3 billion per year by 2020.[25]

## Cancer

Cancer occurs when cells in the body divide without stopping and spread to surrounding tissue. Cancer is the leading cause of mortality in Canada, responsible for 31 per cent of all deaths.[26] The Canadian Cancer Society estimates that over 206,000 Canadians were diagnosed with cancer in 2017.[27] One in two Canadians will develop cancer in their lifetime, and one in four will die of cancer.[28] As the Canadian population ages and grows, the annual number of new cancer cases is expected to increase by 79 per cent between 2003 to 2032.[29]

While the correlation between diet and cancer is difficult to measure, it is estimated that up to one third of cancers can be prevented through healthy eating, exercise, and the maintenance of a healthy body weight.[30] Types of cancer that can be prevented through healthy eating include oral cavity and pharynx, esophageal, larynx, lung, bowel, stomach, breast, endometrial, and kidney cancers.[31,32]

Populations of low socioeconomic status are more likely to develop certain types of cancer, as well as to exhibit cancer risk behaviour, and are less likely to survive from cancers[33,34]. Low socioeconomic status may affect the decisions people make after having been diagnosed with cancer[35] as out-of-pocket costs can be substantial[36]. Although recent figures are not available, the economic cost of cancer in Canada was estimated to be $7.5 billion in 2012, up from $2.9 billion in 2005.[37]

## Obesity

Obesity is an accumulation of fat significant enough to impact health outcomes and defined as a body mass index of 30 or higher. Obesity is a contributing cause of type 2 diabetes, hypertension, cardiovascular disease, arthritis, and cancer.[38] 28 per cent of Canadian adults are obese[39] and this number is expected to rise over the next two decades, affecting more than one in three Canadian adults by 2031.[40] Childhood obesity rates have increased tenfold in the past 40 years worldwide, affecting 7% of children globally[41] and 13% of children in Canada[42]. Obesity led to an estimated $7 billion in health care costs in Canada in 2011, and is projected to cost $8.8 billion annually by 2021.[43]

Canada has one of the highest rates of obesity among OECD countries.[44] While obesity rates vary across the country, rates are higher in rural areas, and among Indigenous peoples and women living on low incomes.[45,46]

## Osteoporosis

Osteoporosis is a disease characterized by decreased bone strength that leads to increased risk of fracture. According to Osteoporosis Canada, two million Canadians are affected by osteoporosis. Over 80 per cent of fractures in people over 50 are caused by osteoporosis, and one in three women and one in five men will suffer from a bone break due osteoporosis in their lifetime.[47] Osteoporosis leads to

reduced quality of life, lower rates of self-esteem, more limited mobility, and even death—28 per cent of women and 37 per cent of men who suffer from a hip fracture will die within one year.[48]

While relatively little research has been conducted on the correlation between income and osteoporosis,[49] studies have found a correlation between low bone mass density and low income.[50] In addition, people with low incomes aged 50 to 70 are disproportionately diagnosed.[51]

The annual cost of osteoporosis to Canada's health care system was $2.3 billion dollar as of 2010, though this number rises to $3.9 billion if long-term care costs are taken into account.[52]

### Dental disease

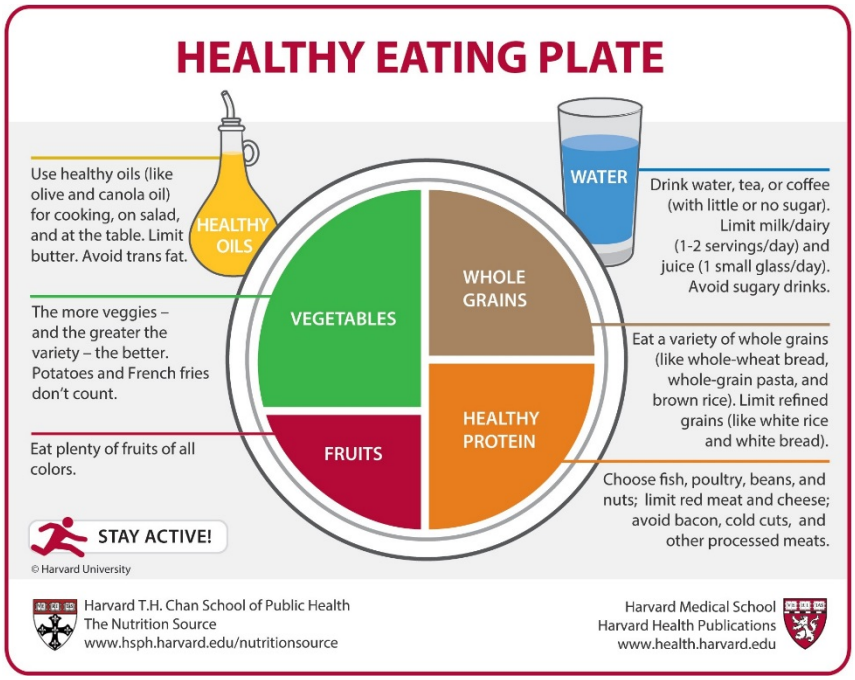
Gum disease (periodontal disease) and tooth decay (dental caries or cavities) are prevalent diseases, and tooth decay is the most common disease worldwide.[53] Although tooth decay is preventable, 57 per cent of 6 to 11 year olds, 59 per cent of 12 to 19 year olds, and 96 per cent of adults have a history of tooth decay. Six per cent of Canadians have no natural teeth, and 21 per cent of adults have moderate to severe dental issues.[54] Dental diseases can lead to an increased risk of cardiovascular disease and poorer overall health.[55]

Proper nutrition is important to tooth development, and malnutrition can contribute to dental diseases. Dietary acids, which many consume in the form of soft drinks, contribute to dental erosion and cavities. There is a correlation between the ingestion of sugar and the development of cavities; conversely, consuming fresh fruit and foods high in starch is correlated with fewer cavities.[56]

Canadians spent $12.8 billion on dental care in 2009. The direct costs of dental care are higher than any other condition other than cardiovascular disease.[57] Because dental care is not included in Canada's public health system, dental health disparities related to income are greater than general health disparities.[58] 32 per cent of Canadians have no dental insurance[59], and six million Canadians avoid seeing dentists because of the cost[60]. Rates of gum disease and decayed or missing teeth are higher among people with less education than among those with post-secondary education.[61]

### Prevention through healthy eating

Diets rich in fruits and vegetables are vital to reducing the risk of obesity, diabetes, many types of cancer, cardiovascular disease, osteoporosis, and dental disease.[62,63] Only 30 per cent of Canadians report eating the recommended five or more servings of fruits and vegetables a day.[64]




The Canada Food Guide is the first stop for many Canadians seeking advice on healthy eating. However, it has been widely criticized for: recommending the same number of servings regardless of activity levels; setting no limit on juice intake; not differentiating between white, red, and processed meats; being overly complicated and difficult to follow; potentially leading to overeating; focusing on nutrients instead of overall diet; and prominently featuring dairy products despite evidence that high dairy consumption can contribute to certain cancers and add saturated fats to diets[65, 66,67].

There exist simpler and more evidence-based resources for healthy eating. One such resource, the Harvard Healthy Eating Plate, recommends a balance of healthy foods instead of numbers of servings, allowing users to base their diets on their calorie needs and activity levels. It is also simpler to follow and recommends limiting red and processed meats, juice, and dairy products.[68]

Canadians do not have an equal opportunity to eat healthy diets. Healthy eating is not just a matter of knowledge or judgement for people living on low incomes; rather, their ability to maintain a healthy diet is constrained by limited resources.

On average, healthy food costs more than unhealthy food. A meta-study found that consuming a healthy diet (rich in fruits, vegetables, fish, and nuts) compared with an unhealthy diet (comprised of processed foods, meat, and refined carbohydrates) added approximately $1.50 to the daily cost of food per person.[69] While this may not seem substantial, it adds up to nearly $550 per person per year, or $2,200 per year for a family of four. Eating healthily is simply unaffordable for many Canadians[70], particularly for people on social assistance given that social assistance rates fall well below the poverty line[71].

Research suggests, for example, that low-income Canadians are far less likely to eat the recommended amount of fruits and vegetables: a study of children in a low-income neighbourhood in London, Ontario found that 98 per cent did not meet the minimum guidelines and that 87 per cent ate fruits and vegetables fewer than two times a day.[72]

Another study found a high level of material needs insecurities among patients with diabetes, and an inverse relationship between the diabetes control and material insecurity.[73] Similarly, rates of household food insecurity for diabetics in active care were found to be more than double the national average.[74] Rates of diabetes are four times higher in the lowest income bracket as in the highest.[75]

A study of American children found a significant correlation between food insecurity and untreated tooth decay.[76] Left untreated, tooth decay can cause pain and eating difficulties and lead to emergency room visits and hospitalization, systemic health problems, and death.[77]

Researchers have suggested that health care practitioners working with low-income patients who suffer from diet-related diseases must take context into account, and that simply providing information on healthy eating may not be sufficient. An emphasis on lifestyle modification places an unfair responsibility on individuals, and focus should therefore be placed on addressing the root and systemic causes of unhealthy eating and dietu related disease.[78]

### Right To Food's theory of change

Community Food Centres and community food programs help to prevent and address diet-related diseases by increasing access to nutritious foods and empowering people build healthy habits. Programs such as community meals and affordable produce markets increase access to healthy foods in welcoming and dignified settings. Hands-on cooking and garden programs, as well as our FoodFit program, help people build the skills, knowledge, and confidence to grow and prepare healthy food for themselves and their families.

Community Food Centres also train peer advocates with lived experience of poverty and marginalization to help community members access necessary material supports in the wider community and provide them with important social supports. Peer advocates place an important emphasis on reducing stigma by working to provide a welcoming atmosphere and respectful and dignified service.

While Community Food Centres and other community food organizations offer much-needed services, supports and programs, only government policies addressing income security, housing, health, agriculture, and other underlying issues can affect widespread change. Government has an important role to play in solving the problems of food insecurity and poverty, diet-related disease, and our unsustainable food system at scale.

Canada is a signatory to the International Covenant on Economic, Social and Cultural Rights, and, as such, has a legal obligation to respect, protect and fulfill the right to food for all its citizens.[79] Yet our governments have not prioritized providing access to healthy food for all and have not implemented systems that connect the dots between healthy food, good physical, mental and social health, and a healthy food system. This is a public health issue, an ethical issue, and a pragmatic issue. Canadian governments must prioritize the eradication of poverty and food insecurity in order to give all Canadians equal opportunity to lead healthy lives.

## References


[1] World Health Organization. (2003). *Diet, nutrition and the prevention of chronic diseases: Report of a joint WHO/FAO expert consultation.* Retrieved from http://www.who.int/dietphysicalactivity/publications/trs916/en/

[2] Willett, W.C. (2002). Balancing life-style and genomics research for disease prevention. *Science, 296*(5568), 695–698.

[3] Statistics Canada. (2017a). *Health fact sheet: The 10 leading causes of death, 2013.* https://www.statcan.gc.ca/pub/82-625-x/2017001/article/14776-eng.htm

[4] Canadian Diabetes Association. (2016). *Diabetes charter backgrounder.* Retrieved from http://www.diabetes.ca/diabetes-and-you/know-your-rights/support-the-diabetes-charter-for-canada/diabetes-charter-backgrounders

[5] Canadian Institute for Health Information. (2015*). International comparisons: A focus on diabetes.* Ottawa, ON: CIHI.

[6] Canadian Diabetes Association. (2011). *Diabetes: Canada at the tipping point – Charting a new path.* Retrieved from https://www.diabetes.ca/publications-newsletters/advocacy-reports/diabetes-canada-at-the-tipping-point

[7] Canadian Diabetes Association. (n.d.). *Types of diabetes*. Retrieved from https://www.diabetes.ca/about-diabetes/types-of-diabetes

[8] Ibid.

[9] Canadian Diabetes Association, 2011.

[10] Public Health Agency of Canada. (2012). *Curbing childhood obesity: A federal, provincial and territorial framework for action to promote healthy weights.* Retrieved from http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/framework-cadre/pdf/ccofw-eng.pdf

[11] Dinca-Panaitescu, S., Dinca-Panaitescu, M., Bryant, T., Daiski, I., Pilkington, B., & Raphael, D. (2011). Diabetes prevalence and income: Results of the Canadian Community Health Survey. *Health Policy, 99*(2), 116–123.

[12] Canadian Diabetes Association, n.d.

[13] Canadian Diabetes Association (2010). *Diabetes: Canada at the tipping point – Charting a new path*. Retrieved from https://www.diabetes.ca/publications-newsletters/advocacy-reports/diabetes-canada-at-the-tipping-point

[14] Rosella, L.C., Lebenbaum, M., Fitzpatrick, T., O'Reilly, D., Wang, J., Booth, G.L., . . . Wodchis, W.P. (2015*).* Impact of diabetes on healthcare costs in a population-based cohort: A cost analysis. *Diabetic Medicine*, 395–403, DOI: 10.1111/dme.12858

[15] Public Health Agency of Canada. (2010). *Six types of cardiovascular disease*. Retrieved from http://www.phac-aspc.gc.ca/cd-mc/cvd-mcv/cvd-mcv-eng.php

[16] Ibid.

[17] Public Health Agency of Canada. (2016). *Health status of Canadians 2016.* Ottawa, ON: PHAC.

[18] Canadian Public Health Association (n.d.). *Decline in deaths from coronary heart disease and stroke*. Retrieved from http://www.cpha.ca/en/programs/history/achievements/03-hds.aspx

[19] Ibid.

[20] Public Health Agency of Canada. (2017a). *Heart disease in Canada: Highlights from the Canadian chronic disease surveillance system.* Retrieved from https://www.canada.ca/en/public-health/services/publications/diseases-conditions/heart-disease-canada-fact-sheet.html#fn1

[21] Statistics Canada, 2017a.

[22] Public Health Agency of Canada, 2009.

[23] Ibid.

[24] Public Health Agency of Canada, 2016.

[25] Conference Board of Canada. (2010). *The Canadian heart health strategy: Risk factors and future cost implications*. Retrieved from http://www.conferenceboard.ca/e-library/abstract.aspx?did=3447

[26] Statistics Canada, 2017a.

[27] Canadian Cancer Society's Advisory Committee on Cancer Statistics. (2017). *Canadian Cancer Statistics 2017.* Toronto, ON: Canadian Cancer Society.

[28] Ibid.

[29] Ibid.

[30] Canadian Cancer Society. (2015). *Nutrition and fitness*. Retrieved from https://www.cancer.ca/en/prevention-and-screening/live-well/nutrition-and-fitness/?region=on

[31] Cancer Research UK. (2014). *Statistics on preventable cancers*. Retrieved from http://www.cancerresearchuk.org/cancer-info/cancerstats/causes/preventable/#Preventable

[32] World Health Organization. (n.d.). *Cancer: Cancer prevention.* Retrieved from http://www.who.int/cancer/prevention/en/

[33] Canadian Partnership Against Cancer. (2016). *The 2016 Cancer System Performance Report.* Toronto (ON): Canadian Partnership Against Cancer.

[34] Public Health Agency of Canada, 2016.

[35] Canadian Cancer Society (2015). *Socio-economic status*. Retrieved from http://www.cancer.ca/en/cancer-information/cancer-101/what-is-a-risk-factor/socio-economic-status/?region=bc

[36] Canadian Cancer Action Network & Canadian Cancer Society, Manitoba Division. (2012). *Five-year action plan to address the financial hardship of cancer in Canada: A call for action*. Retrieved from https://www.cancer.ca/~/media/cancer.ca/MB/get%20involved/take%20action/financial%20hardship%20of%20cancer%20in%20canada/financialhardshipofcancer-MB-EN.pdf

[37] de Oliveira, D., Weir, S., Rangrej, J., Krahn, M.D., Mittmann, N., Hoch, J.S., . . . Peacock, S. (2018). The economic burden of cancer care in Canada: a population-based cost study. *CMAJ Open, 6*(1), e1-e10.

[38] Public Health Agency of Canada. (2011). *Obesity in Canada: A joint report from the Public Health Agency of Canada and the Canadian Institute for Health Information.* Retrieved from http://www.obesitynetwork.ca/obesity-in-canada

[39]Public Health Agency of Canada. (2017b). At-a-glance: The 2017 Canadian chronic disease indicators. *Health Promotion and Chronic Disease Prevention in Canada, 37*(8), 248–251.

[40] Bancej, C., Jayabalasingham, B., Wall, R.W., Rao, D.P., Do, M.T., de Groh, M., & Jayaraman, G.C. (2015). Trends and projections of obesity among Canadians. *Health Promotion and Chronic Disease Prevention in Canada, 35(7),* 109-112.

[41] World Health Organization. (2017, October 11). *Tenfold increase in childhood and adolescent obesity in four decades: New study by Imperial College London and WHO.* Retrieved from http://www.who.int/mediacentre/news/releases/2017/increase-childhood-obesity/en/

[42] Public Health Agency of Canada, 2017b.

[43] Bancej et al., 2015.

[44] Organization for Economic Co-operation and Development. (2017). *Obesity Update 2017*. Retrieved from http://www.oecd.org/health/obesity-update.htm

[45] Public Health Agency of Canada, 2011.

[46] Senate of Canada. (2016). *Obesity in Canada: A whole society approach for a healthier Canada.* Retrieved from https://sencanada.ca/content/sen/committee/421/soci/rms/01mar16/Report-e.htm

[47] Osteoporosis Canada. (2017). *Impact report 2017.* Retrieved from https://osteoporosis.ca/our-mission/impact-report-2017/

[48] Osteoporosis Canada. (n.d). *About the disease.* Retrieved March 15, 2018 from https://osteoporosis.ca/about-the-disease/

[49] Garriguet, D. (2011). *Bone health: Osteoporosis, calcium and vitamin D*. Statistics Canada. Retrieved from http://www.statcan.gc.ca/pub/82-003-x/2011003/article/11515-eng.htm

[50] Wang, M.-C., Dixon, L.B. (2006). Socioeconomic influences on bone health in postmenopausal women: Findings from NHANES III, 1988–1994. *Osteoporosis International, 17*(1), 91-98.

[51] Statistics Canada, (2009). *Study: Osteoporosis, calcium and vitamin D*. Retrieved from http://www.statcan.gc.ca/daily-quotidien/110720/dq110720b-eng.htm

[52] Tarride, J.-E., Hopkins, R.B., Leslie, W.D., Morin, S., Adachi, J.D., Papaioannou, . . . Goeree, R. (2012). The burden of illness of osteoporosis in Canada. *Osteoporosis International, 23*(11), 2591-2600.

[53] Canadian Dental Association. (2017). *The state of oral health in Canada.* Retrieved from https://www.cda-adc.ca/stateoforalhealth/

[54] Health Canada (2010). *Oral health statistics 2007-2009*. Retrieved from http://www.hc-sc.gc.ca/hl-vs/pubs/oral-bucco/fact-fiche-oral-bucco-stat-eng.php

[55] Laine, M.L. & Crielaard, W. (2012). Functional foods/ingredients and periodontal diseases. *European Journal of Nutrition 51*(Supplement 2), S27-S30.

[56] Moynihan, P and Petersen, PE (2004). Diet, nutrition and the prevention of dental diseases. *Public Health Nutrition 7*(1A): 201-226.

[57] Health Canada (2010). *Report on the findings of the Oral Health Component of the Canadian Health Measures Survey 2007-2009*. Retrieved from http://www.fptdwg.ca/assets/PDF/CHMS/CHMS-E-tech.pdf

[58] Canadian Academy of Health Sciences. (2014). *Improving access to oral health care for vulnerable people living in Canada*. Retrieved from http://www.cahs-acss.ca/wp-content/uploads/2014/09/Access_to_Oral_Care_FINAL_REPORT_EN.pdf

[59] Canadian Dental Association. (2017). *The state of oral health in Canada.* Retrieved from https://www.cda-adc.ca/stateoforalhealth/

[60] Canadian Academy of Health Sciences, 2014.

[61] Ibid.

[62] Lanham-New, S.A. (2006). Fruits and vegetables: The unexpected natural answer to the question of osteoporosis prevention? *The American Journal of Clinical Nutrition,* 83(6), 1254-1255.

[63] Ontario Ministry of Health and Long-term Care (2012). *Initial report on public health: Fruit and vegetable consumption*. Retrieved from http://www.health.gov.on.ca/en/public/publications/pubhealth/ init_report/favc.html

[64] Statistics Canada. (2017b). Health fact sheet: Fruit and vegetable consumption, 2016. Retrieved from http://www.statcan.gc.ca/ pub/82-625-x/2017001/article/54860-eng.htm

[65] Harvard School of Public Health. (2015). *The nutrition source: Calcium and milk*. Retrieved from http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/calcium-and-milk/

[66] Mahsa, J., & L'Abbé, M. (2015). The time for an updated Canadian Food Guide has arrived. *Applied Physiology, Nutrition, and Metabolism*. Draft text. Retrieved from https://tspace.library.utoronto.ca/bitstream/1807/69168/1/apnm-2015-0046.pdf

[67] Freedhoff, Y. (2015, April 26). Canada's Food Guide is broken – and no one wants to fix it. *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/life/health-and-fitness/health-advisor/canadas-food-guide-is-broken-and-no-one-wants-to-fix-it/article24111642/?cmpid=rss1&click=sf_globe

[68] Harvard School of Public Health. (2011). *Healthy Eating Plate & Healthy Eating Pyramid*. Retrieved from http://www.hsph.harvard.edu/nutritionsource/healthy-eating-plate/
Copyright © 2011, Harvard University. For more information about The Healthy Eating Plate, please see The Nutrition Source, Department of Nutrition, Harvard School of Public Health, www.thenutritionsource.org, and Harvard Health Publications, www.health.harvard.edu.

[69] Rao, M., Afshin, A., Singh, G., & Mozaffarian, D. (2013). Do healthier foods and diet patterns cost more than healthier options? A systematic review and meta-analysis. *BMJ Open, 3*(12), 1-16.

[70] Daily Bread Food Bank. (2014). *Who's Hungry: 2014 Profile of Hunger in the GTA*. Retrieved from http://www.dailybread.ca/wp-content/uploads/2013/09/Whos-Hungry-Report-2014.pdf

[71] Tweddle, A., Battle, K., & Torjman, S. (2017*). Welfare in Canada, 2016. The Caledon Institute of Social Policy.* Retrieved from https://maytree.com/publications/welfare-canada-2016/

[72] Glen, K.E., Thomas, H.N., Loebach, J.E., Gilliland, J.A., & Gobert, C.P. (2013). Fruit and vegetable consumption among children in a socioeconomically disadvantaged neighbourhood. *Canadian Journal of Dietetic Practice and Research, 74*(3), 114-118.

[73] Berkowitz, S.A., Meigs, J.B., DeWalt, D., Seligman, H.K., Barnard, L.S., Bright, O.M., . . . Wexler, D.J. (2015). Material need insecurities, control of diabetes, mellitus, and use of health care resources: Results of the measuring economic insecurity in diabetes study. *JAMA Internal Medicine, 175*(2), 257-265.

[74] Galesloot, S., McIntyre, L., Fenton, T., & Tyminski, S. (2012). Food insecurity in adults receiving diabetes care. *Canadian Journal of Dietetic Research and Practice, 73*(3), e261-e266.

[75] Dinca-Panaitestcu, S., Dinca-Panaitescu, M., Bryant, T., Daiski, I., Pilkington, B., & Raphael, D. (2011). Diabetes prevalence and income: Results of the Canadian Community Health Survey. *Health Policy, 99*(2), 116-123.

[76] Chi, D.L., Masterson, E.E., Carle, A.C., Mancl, L.A., & Coldwell, S.E. (2014). Socioeconomic status, food security, and dental caries in US children: Mediation analysis of data from the National Health and Nutrition Examination Survey, 2007-2008. *American Journal of Public Health, 104*(5), 860-864.

[77] Ibid.

[78] Clark, A.M., Duncan, A.S., Trevoy, J.S., Health, S., & Chan, M. (2011). Healthy diet in Canadians of low socioeconomic status with coronary heart disease: Not just a matter of knowledge and choice. *Heart & Lung – The Journal of Acute and Critical Care,* 40(2), 156-163.

[79] Office of the United Nations High Commissioner for Human Rights. (2013). *Olivier De Schutter, Special Rapporteur on the right to food: Visit to Canada from 6 to 16 May 2012*. Retrieved from http://www.srfood.org/images/stories/pdf/officialreports/201205_canadaprelim_en.pdf