Written Testimony to the National Commission on Hunger

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Background

I am honored to be invited to contribute written testimony to the National Commission's deliberations. I am a professor in the Department of Nutritional Sciences, in the Faculty of Medicine at the University of Toronto. For more than two decades now, I have been engaged in research to elucidate the causes and consequences of household food insecurity in Canada. Currently, I am the Principal Investigator of PROOF, a 5-year research program funded by the Canadian Institutes of Health Research to identify policy interventions to reduce food insecurity in Canada.

For the past decade, food insecurity has been monitored in Canada using the food security module that was developed by USDA and is routinely administered on US surveys, although different thresholds and labels are used to describe the severity of food insecurity in Canada. (See Table 1 for a comparison of the coding and terminology applied in Canada and the US.) Comparisons of survey results consistently reveal that the prevalence of food insecurity is much lower in Canada than in the USA. In 2012, 6.8% of Canadian households were food insecure (applying USDA's definition of this term), versus 14.5% in the US over this same period (1;2). Despite the lower prevalence, food insecurity appears to be a stronger marker of nutritional vulnerability in Canada than the US (3). The socio-demographic characteristics associated with food insecurity in Canada and the US also differ somewhat (4), and there are marked differences in policy and programmatic responses to this problem in the two countries. Nonetheless, there appear to be many similarities in the manifestations and health implications of food insecurity in Canada and the US.

In both Canada and the US, there is extensive evidence of the associations between food insecurity and ill-health as indicated by multiple physical and mental health conditions, after controlling for household socio-economic characteristics (5-20). In addition, there is evidence of a graded relationship between food insecurity and health, with adults in more severely food-insecure households more likely to report chronic health conditions (13;17;21-23) and to have been diagnosed with multiple conditions (17). There is also Canadian and US evidence of poorer disease management among individuals in food-insecure environments (12;24-27), increase the probability that they will become high-cost users of the health care system in Canada (28), and heighten the risk of negative disease outcomes (24;29). However, the bulk of the literature on household food insecurity and health is based on self-reported measures of health. Moreover, most research has focused on global measures of health or particular conditions such as diabetes and depression.

Our recent examination of the health care costs associated with food insecurity in Ontario, Canada (30) extends this understanding by quantifying the total burden of ill-health among working aged adults, from the perspective of the payer – in this case the Ontario Ministry of Health and Long-Term Care. In Canada unlike in the US, the provision of health care is universal, so health administrative data provide a

good estimate of the burden of ill-health in the population. A copy of our manuscript is attached. Below I briefly summarize the study methods and key findings.

Using linked survey and administrative health care data from Ontario, this study was undertaken to examine the relationship between adults' household food security status over a 12-month period and their direct health care costs over this period. The sample comprised 67,033 Ontario residents, 18-64 years old, who participated in the Canadian Community Health Survey in 2005, 2007-08 or 2009-10 and for whom Ontario administrative health care data could be linked. Household food insecurity was assessed on the Canadian Community Health Survey using the food security survey module, and households were classified as food secure or marginally, moderately, or severely food insecure, following the coding scheme outlined in Table 1. Two-part regression models were used to determine the relationship between household food insecurity and the costs associated with each respondent's health care utilization, while adjusting for respondent's age and sex, income (represented as neighbourhood income quintiles), educational attainment, household composition, and home ownership. The total health care costs considered included those associated with physician visits, acute and psychiatric hospitalization, emergency department visits, same-day surgeries, home care, and out-patient prescription medications that are covered by the province for people receiving social assistance. Because these prescription drug costs are not universal, and access is associated with participation in an income assistance program associated with very high risk of food insecurity, all analyses were run with and without the inclusion of this cost category.

Figure 1 illustrates the mean health care costs incurred by adults over 12 months, by household food security status. A statistically significant linear trend ($p < 0.05$) was observed for all cost categories except 'other'. That category includes costs associated with rehabilitation, complex continuing care, long-term care, and assisted devices.

The results of the two-part regression models indicated that household food insecurity was a robust predictor of health care costs, independent of other well-established social determinants of health (i.e., income and education). The odds of adults incurring health care costs rose significantly if they were living in a moderately or severely food insecure household, while the total costs incurred by those who used health care rose systematically with the severity of food insecurity. After adjusting for socio-demographic factors, total health care costs of adults in marginally food insecure households were, on average, 16% higher than the costs for adults in food secure households, 32% higher for adults in moderately food insecure households, and 76% higher for those in severely food insecure households when compared with adults in food secure households. These differences rose to 23%, 49% and 112% respectively when the costs of prescription drugs covered by the province for social assistance recipients were included. The latter differences more accurately reflect the full costs of food insecurity among working-aged adults for our provincial health care system. It must be stressed, however, that the actual costs of food insecurity to our society go well beyond those borne over a 12 month period by our health care system.

It should be noted that even among adults in households affirming only one item on the 18-item food security survey module (here referred to as the 'marginally food insecure') we detected a significant increase in total health care spending compared to those in food secure households. This finding adds

to a growing body of evidence suggesting that any affirmative response to the module should be treated as an indication of food insecurity (e.g., (31). The common practice of treating households with one or two affirmatives as 'food secure' must be introducing misclassification errors.

The literature on health care expenditures associated with food insecurity is very sparse, in part because of the paucity of datasets that include measures of both health care utilization and household food security status. Our findings are consistent with reports of increased health care utilization in conjunction with food insecurity, although most prior studies have focused on specific population subgroups characterized by disease status (12;25;32) or age (33). It is difficult to draw direct parallels between our study and others on health care spending that have been published in the US because of the selection effects associated with health care utilization in the US. For example, one study of older adults in the US state of Georgia reported an inverse association between food insecurity and the probability of incurring Medicare expenditures, and lower expenditures among food-insecure adults who accessed Medicare (7), but inferences from this study are limited by the assessment of food insecurity over only a 30-day period and by other potential barriers to health care access among this population.

We acknowledge that inferences from our study are also limited by the cross-sectional nature of our data. The strong gradient in health care costs in relation to severity of household food insecurity suggests a possible causal relationship between food insecurity and health care utilization. However, it is important to recognize the evidence that poor health among adults can increase the likelihood of food insecurity, at least under some circumstances (11;19;34-36). Longitudinal data are needed to elucidate the pathway(s) through which household food insecurity impacts individuals' health and associated use of health care. More research is also needed to map the health care costs associated with food insecurity among other age groups.

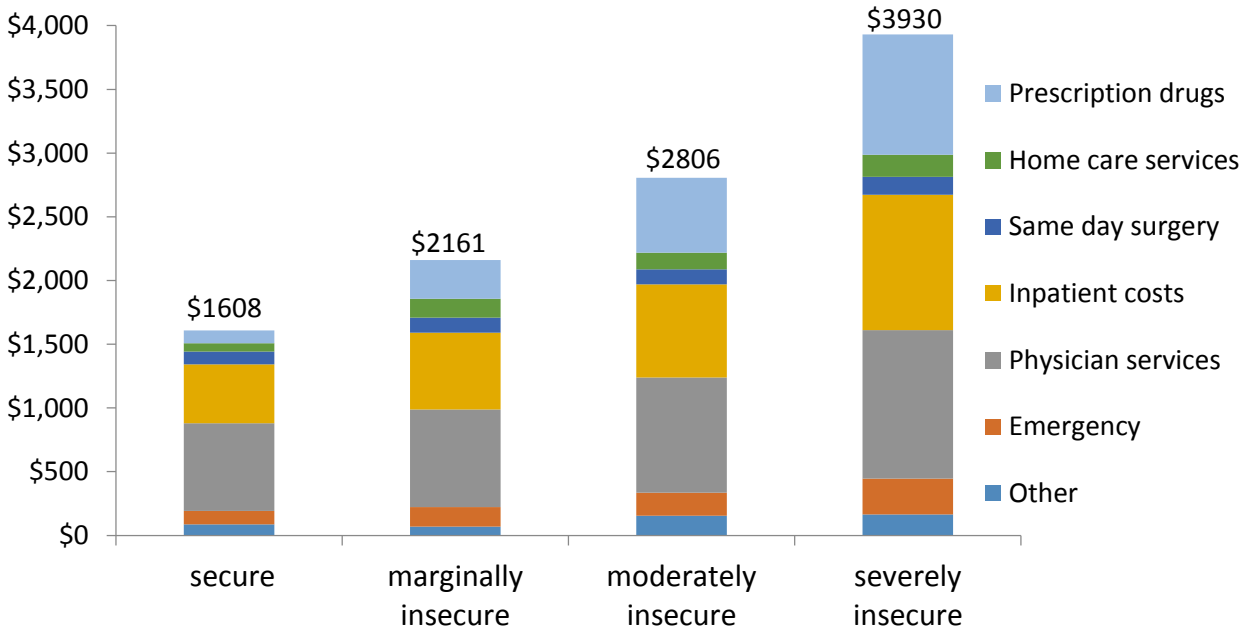
Recognizing the limitations of our study, I would argue that our results make a strong 'business case' for effective interventions to reduce the prevalence and severity of household food insecurity. Our findings indicate that health care spending is in part a function of the food security status of the population being served. Insofar as household food insecurity impacts health, it takes a toll on public health care expenditures. Thus, reducing food insecurity can be expected to offset considerable public expenditures in the health system.

Table 1. Terminology and thresholds used in Canada and the US to describe levels of severity of household food insecurity, based on the number of affirmative responses to the 18-item food security survey module.

	10-item adult scale	**8-item child scale**
Canadian terminology and thresholds		
Food secure	0 affirmatives	0 affirmatives
Marginal food insecurity*	1 affirmative	1 affirmative
Moderate food insecurity	2-5 affirmatives	2-4 affirmatives
Severe food insecurity	≥ 6 affirmatives	≥ 5 affirmatives
US terminology and thresholds		
Food secure	**0-2 affirmatives**	**0-1 affirmatives**
Low food security	**3-5 affirmatives**	**2-4 affirmatives**
Very low food security	**≥ 6 affirmatives**	**≥ 5 affirmatives**

*Although 'marginal food insecurity' has not been included as a level of household food insecurity in Health Canada's original documentation (37), it is included here because this categorization was applied in our study on health care spending (Tarasuk et al, 2015).

Figure 1. Mean health care costs incurred over 12 months by Ontario adults (18-64 years of age), by household food security status (adapted from Tarasuk et al, Can Med Assoc J 2015)



Reference List

(1) Coleman-Jensen A, Nord M, Singh A. Household Food Security in the United States in 2012. U.S. Department of Agriculture, Economic Research Services; 2013. Report No.: ERR-155.

(2) Tarasuk V, Mitchell A, Dachner N. Household food insecurity in Canada, 2012. Toronto ON: Research to Identify Policy Options to Reduce Food Insecurity (PROOF); 2014.

(3) Kirkpatrick S, Dodd KW, Parsons R, Ng C, Garriguet D, Tarasuk V. Household food insecurity is a stronger marker of adequacy of nutrient intakes among Canadian compared to American youth and adults. J Nutr 2015;145(7):1596-603.

(4) Nord M, Hopwood H. A comparison of household food security in Canada and the United States. U.S. Department of Agriculture, Economic Research Services; 2008. Report No.: EER-67.

(5) Anema A, Vogenthaler N, Frongillo EA, Kadiyala S, Weiser S. Food insecurity and HIV/AIDS: current knowledge, gaps, and research priorities. Current HIV/AIDS Reports 2009;6:224-31.

(6) Seligman HK, Schillinger D. Hunger and socioeconomic disparities in chronic disease. N Engl J Med 2010;363(1):6-9.

(7) Bhargava V, Lee J.S., Jain R, Johnson M, Brown A. Food insecurity is negatively associated with home helath and out-of-pocket expenditures in older adults. J Nutr 2012.

(8) Bronte-Tinkew J, Zaslow M, Capps R, Horowitz A, McNamara M. Food insecurity works through depression, parenting, and infant feeding to influence overweight and health in toddlers. J Nutr 2007;137:2160-5.

(9) Che J, Chen J. Food insecurity in Canadian households. Health Rep 2001;12(4):11-22.

(10) Davison K, Marshall-Fabien G, Tecson A. Association of moderate and severe food insecurity with suicidal ideation in adults: national survey data from three Canadian provinces. Soc Psychiatry Psychiatr Epidemiol 2015.

(11) Heflin CM, Siefert K, Williams DR. Food insufficiency and women's mental health: findings from a 3-year panel of welfare recipients. Soc Sci Med 2005;61:1971-82.

(12) Nelson K, Cunningham W, Andersen R, Harrison G, Gelberg L. Is food insufficiency associated with health status and health care utilization among adults with diabetes? J Gen Intern Med 2001;16:404-11.

(13) Seligman HK, Bindman AB, Vittinghoff E, Kanaya AM, Kushel MB. Food insecurity is associated with diabetes mellitus: results from the National Health Examination and Nutrition Examination Survey (NHANES) 1999-2002. J Gen Intern Med 2007;22:1018-23.

(14) Seligman HK, Laraia BA, Kushel MB. Food insecurity is associated with chronic disease among low-income NHANES participants. J Nutr 2010;140:304-10.

(15) Siefert K, Heflin CM, Corcoran ME, Williams DR. Food insufficiency and the physical and mental health of low-income women. Women & Health 2001;32(1/2):159-77.

(16) Stuff JE, Casey P.H., Szeto KL, Gossett JM, Robbins JM, Simpson PM, et al. Household food insecurity is associated with adult health status. J Nutr 2004;134:2330-5.

(17) Tarasuk V, Mitchell A, McLaren L, McIntyre L. Chronic physical and mental health conditions among adults may increase vulnerability to household food insecurity. J Nutr 2013;143(11):1785-93.

(18) Vozoris N, Tarasuk V. Household food insufficiency is associated with poorer health. J Nutr 2003;133(1):120-6.

(19) McLeod L, Veall M. The dynamics of food insecurity and overall health: evidence from the Canadian National Population Health Survey. Applied Economics 2006;38:2131-46.

(20) Nakhaie R, Arnold R. A four year (1996-2000) analysis of social capital and health status in Canada: The difference that love makes. Soc Sci Med 2010;71:1037-44.

(21) Galesloot S, McIntyre L, Fenton T, Tyminski S. Food insecurity in Canadian adults receiving diabetes care. Can J Diet Prac Res 2012;73:e261-e266.

(22) Muldoon K, Duff P, Fielden S, Anema A. Food insufficiency is associated with psychiatric morbidity in a nationally representative study of mental illness among food insecure Canadians. Soc Psychiatry Psychiatr Epidemiol 2012;48(5):795-803.

(23) Whitaker RC, Phillips SM, Orzol SM. Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children. Pediatrics 2006;118(3):e859-e868.

(24) Anema A, Chan K, Weiser S, Montaner J, Hogg R. Relationship between food insecurity and mortality among HIV-positive injection drug users receiving antiretroviral therapy in British Columbia, Canada. PLoS One 2013;8(5):e61277.

(25) Gucciardi E, DeMelo M, Vogt J, Stewart D. Exploration of the relationship between household food insecurity and diabetes care in Canada. Diabetes Care 2009;32:2218-24.

(26) Seligman HK, Jacobs E, Lopez A, Tschann J, Fernandez A. Food insecurity and glycemic control among low-income patients with type 2 diabetes. Diabetes Care 2012;35:233-8.

(27) Seligman HK, Davis T, Schillinger D, Wolf M. Food insecurity is associated with hypoglycemia and poor diabetes self-management in a low-income sample with diabetes. J Health Care Poor Underserved 2010;21:1277-33.

(28) Fitzpatrick T, Rosella L, Calzavara A, Petch J, Pinto A, Manson H, et al. Looking beyond income and education: socioeconomic status gradients among future high-cost users of health care. American Journal of Preventive Medicine 2015.

(29) Ford E. Food security and cardiovascular disease risk among adults in the United States: findings from the National Health and Nutrition Examination Survey, 2003-2008. Preventing Chronic Disease 2013;10:130244.

(30) Tarasuk V, Cheng J, de Oliveira C, Dachner N, Gundersen C, Kurdyak P. Association between household food insecurity and annual health care costs. Can Med Assoc J 2015;DOI:10.1503/cmaj.150234.

(31) Coleman-Jensen A. U.S. food insecurity status: toward a refined definition. Soc Indic Res 2010;95:215-30.

(32) Marjerrison S, Cummings E, Glanville NT, Kirk S, Ledwell M. Prevalence and associations of food insecurity in children with diabetes mellitus. J Pediatr 2010.

(33) Cook JT, Frank D.A., Berkowitz C., Black M.M., Casey P.H., Cutts D.B., et al. Food insecurity is associated with adverse health outcomes among human infants and toddlers. J Nutr 2004;134(6):1432-8.

(34) Heflin CM, Corcoran ME, Siefert K. Work trajectories, income changes, and food sufficiency in a Michigan welfare population. Soc Serv Rev 2007;March:3-25.

(35) Huang J, Guo B, Kim Y. Food insecurity and disability: do economic resources matter? Soc Sci Res 2010;39:111-24.

(36) Huddleston-Casas C, Charnigo R, Simmons L. Food insecurity and maternal depression in rural, low-income families: a longitudinal investigation. Public Health Nutr 2009;12(8):1133-40.

(37) Health Canada. Canadian Community Health Survey, Cycle 2.2, Nutrition (2004) - Income-Related Household Food Security in Canada. Ottawa, ON: Office of Nutrition Policy and Promotion,Health Products and Food Branch,Health Canada; 2007. Report No.: 4696.