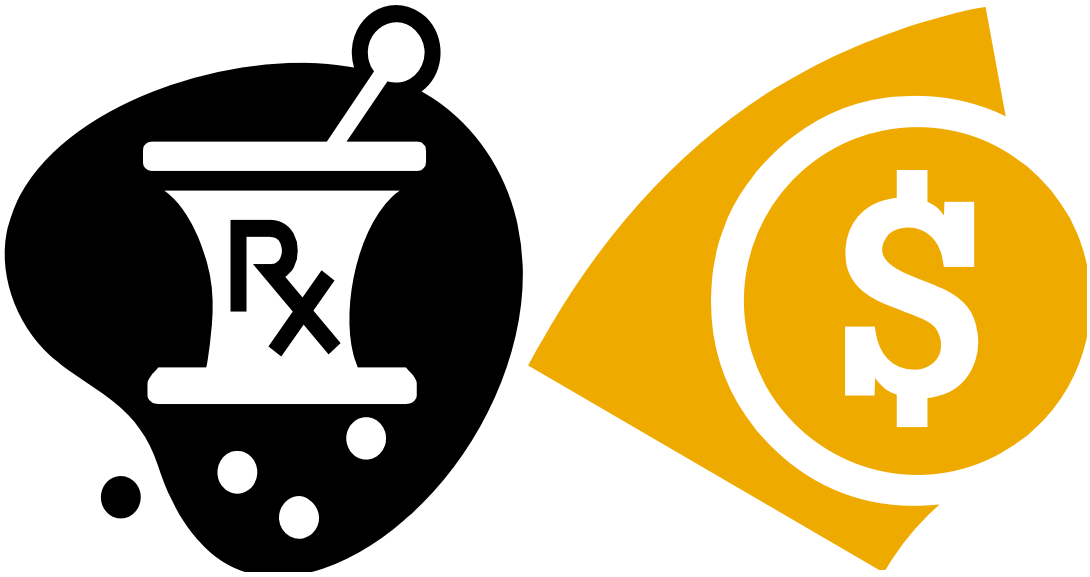
Food Insecurity in the Chronic Kidney Disease Population

February 28, 2014 Meeting: Summary Report



July 3, 2014

Acknowledgements

Thank you to everyone who took time out of their hectic lives and practices to brave a frigid day to learn about food insecurity and how it might be affecting the chronic kidney disease population. This was the start of what we hope will be an ongoing conversation about how to bring together the knowledge gained through both research and practice, with the goal of better identifying and working with our clients/patients in the health system who are experiencing food insecurity.

We thank Gail MacKean (Meeting facilitator) and Krista Rondeau (Report drafter)

On behalf of all the members of the planning committee

Funding

Funding for this meeting was provided by a Campus Alberta Health Outcomes and Public Health (CAHOPH) meeting grant.

Citation

McIntyre L, Rondeau K. Food Insecurity in the Chronic Kidney Disease Population February 28, 2014 Meeting: Summary Report, July 3, 2014, Author: Calgary, 26pp

Background

Household food insecurity, i.e., the inability to access food due to financial constraints, is prevalent in the general Alberta population. In 2011, 12.3 per cent of Albertan households reported experiencing some form of food insecurity. Emerging research has shown that populations with chronic diseases are at greater risk for food insecurity and its corresponding health implications; notably, two small studies conducted by the meeting host in Calgary, documented an increased prevalence in populations with diabetes and HIV/AIDS than found in the general population. Limited studies exist that explore the prevalence and disease management consequences of food insecurity among those accessing the health care system. This is particularly true for the chronic kidney disease (CKD) population.

The *Food Insecurity in the Chronic Kidney Disease Population* meeting was organized to engage a breadth of stakeholders and personnel of the Southern Alberta Renal Program (SARP), Alberta Health Services (AHS) clinicians, key decision leaders working in nutrition services, chronic disease management, and public health ,and researchers from the Universities of Calgary and Alberta, in a discussion on how to understand and respond to food insecurity within the chronic kidney disease population in Southern Alberta (specifically within SARP). Background information provided to participants can be found in Appendix A.

Snapshot of the Day

1. Welcome and introductions
2. Questions for the day
3. Panel presentations
    a. Campus Alberta
    b. Southern Alberta Renal Program
4. Knowledge Café: Deeper dive
    a. Screening feasibility
    b. Possible interventions
    c. Positioning a project for innovation funding
5. Report back and large group discussion
6. Closing

Welcome & Introductions

Carlota Basualdo-Hammond, Executive Director of Nutrition Services, Alberta Health Services and co-lead of the *Campus Alberta Food Insecurity in Health Settings* ("Campus Alberta") group welcomed the participants to the meeting and introduced the members of the planning committee (see Appendix B). Carlota challenged practitioners to consider the implications of food insecurity in their practice and how doing so can help improve the quality of care.

After these welcoming remarks, participants introduced themselves to the group. Gail MacKean (facilitator) remarked that a breadth of participants was invited to participate in order to bridge gaps between research, practice, and policy (Appendix B). Gail then walked the group through the day's agenda and outlined what the planning committee hoped to achieve by the end of the day. In particular, the following two questions were to be considered:

1. How do we identify/screen for food insecure individuals among the chronic kidney disease population, and how can we make the screening process feasible?

2. What should be the path forward with regards to possible interventions?

Actions applicable to practice and important research questions will come from participants' input.

Panel Presentations

Campus Alberta group

Lynn McIntyre provided an overview of food insecurity and its implications for the health care setting. Anna Farmer presented on the measurement of food insecurity. Suzanne Galesloot presented findings from a previous study on food insecurity in a diabetes clinic and new insights from the HIV/AIDS clinic. An overview of these presentations follows:

Food insecurity

- What is food insecurity
- Prevalence of food insecurity by province, income, source of income, health status, social gradient
- Risk factors associated with increased vulnerability to food insecurity
- How poverty alleviation programs impact food insecurity rates
- Chronic illness and food insecurity

Measurement of food insecurity

- The four domains of food insecurity (beyond absolute deprivation)
- Measuring food insecurity with the 18-item Household Food Security Survey Module (HFSSM)
- Limitations of HFSSM in the clinical setting
- Alternative ways to measure food insecurity and scoping review

Food insecurity in a clinical setting

- Overview of study measuring food insecurity rates in adults receiving diabetes care
- Prevalence of adult food insecurity in HIV/AIDS population

The main messages from these three presentations, including responses to questions raised by meeting participants, are summarized below:

- Food insecurity is about inadequate food due to income and financial constraints. It is more than absolute food deprivation and is experienced across four dimensions: psychological, quality, quantity, and social acceptability.
- The highest prevalence of food insecurity in Canada is among those receiving social assistance. Poverty reduction programs (e.g., Newfoundland and Labrador) and schemes like guaranteed annual income/pensions have shown to significantly reduce food insecurity rates.
- Other factors associated with increased vulnerability to food insecurity include not owning a home; being Aboriginal or African Canadian; living in urban Canada; being a lone-parent, living in

a female-led household; and relying on social assistance. Note that many food insecure households are reliant on employment income.

- There is a reciprocal relationship between food insecurity and poor health, including chronic conditions. Ways that chronic conditions can heighten the risk of food insecurity include:
    - Chronic disease can diminish adults' earning power
    - Chronic ill-health places additional demands on resources
    - Ill-health reduces individuals ability to cope with their condition
- The health burden of food insecurity occurs as a social gradient and goes beyond nutrition-related conditions.
- The HFSSM is the standard for measuring the psychological, qualitative, and quantitative domains of food insecurity by categorizing households as *food secure*, *marginally food insecure*, *moderately food insecure*, and *severely food insecure*. It is the tool used in the Canadian Community Health Survey (CCHS). It is not meant to provide an assessment of dietary or nutritional adequacy. Note that food insecure individuals cannot be identified through standard dietary assessment tools.
- The use of the HFSSM is limited in a clinical setting because it only measures a household's experience of food insecurity over the previous 12 months and cannot assume that food insecurity status is shared by all household members (i.e., it does not measure individual food security status).
- Other measurement tools that could be used in brief clinical encounters to capture whether an individual is food insecure and its severity are being studied as part of a separate scoping review. Severity is most important clinically and in terms of therapeutic dietary requirements such as the renal diet.
- A previous study examined food insecurity prevalence in adults with diabetes mellitus attending an outpatient diabetes clinic in Calgary showed that the clinic population experienced food insecurity at a rate that is double that of the general population and also more severe. Subsequent comparison of the study's data with more recent PROOF study data demonstrated that study participants were not over-reporting severity.
- Risk factors and dietary assessment are insufficient to discern food insecurity in the patient population. Screening is essential for identification of those experiencing food insecurity.

SARP group

The team from the SARP clinic at the Sheldon Chumir Centre ("the clinic") provided an overview of the outpatient clinic experience for those living with chronic kidney disease . Presentations were made by Kin Tam, unit manager of the clinic; Lia Sauve, dietitian; Michelle Canale Holmes, social worker; Sandra Anderson, nurse practitioner; and Matt James, physician. Overall, the team from SARP was concerned about food insecurity in their patient population and its impact on patients' ability to manage CKD; however, they were also concerned about the ethical implications of screening without being able to provide adequate assistance. The team was keen to learn from the day's activities and identify how they may better address food insecurity in their patient population.

An overview of each presentation, including issues raised during the question period following the panel presentations, is outlined below.

Kin Tam (unit manager)

- The goals of the clinic are early identification, delaying progression of disease, providing education to patients on treatment options (e.g., hemodialysis [HD], home therapy, peritoneal dialysis [PD], transplant), and the facilitation of end-of-life care and planning.

- In addition to the CKD clinic at Sheldon Chumir, there are CKD clinics across southern Alberta, including Lethbridge and Medicine Hat.

- Patients are referred to the clinic once they have 30% or less kidney function. There are five stages of kidney disease, and most patients at the clinic are Stage III-V (end stage).

- The health care team at the clinic comprises nurses, social workers, renal pharmacists, renal dietitians, nurse practitioners, and a nephrologist. Patients may not see all health care professionals, and this is driven by their personal health care needs. At the initial assessment, all patients will see a nurse and a dietitian, and 85% of patients will see a social worker.

- A case management approach is used in the provision of care. Seven fulltime nurse clinicians act as case managers for approximately 150 patients each. There is one nurse clinician who manages end-of-life care.

- The frequency of clinic visits depends on kidney function. At Stage III, patients usually visit the clinic once per year, but this can be more frequent depending on their health care needs; at Stage IV (20% kidney function or less), clinic visits are typically every 3-6 months; at Stage V (<15% kidney function), clinic visits are every 3 months.

- The clinic uses an electronic medical records software (Patient-based Renal Information System [PARIS]) that provides data storage (e.g., document scanning, diagnostic testing), appointment bookings, and data input (risk assessment, goals of care, dialysis information). PARIS is limited

however, as it doesn't interface with Alberta Netcare and therefore is not a complete medical record for patients. Furthermore, the information in PARIS is only as accurate as the person who enters the information.

- Approximately 30% of patients at the clinic (as well as at other SARP clinics) are ESL. Face-to-face translation is no longer part of the clinic's budget; phone-based language services and translation by family members are used to assist in delivering treatment and care.

Lia Sauve (dietitian)

- The role of the dietitian is to conduct a complete nutritional assessment on admission. This includes recording weight, medications, supplements, and blood work; identifying household food purchasing practices, household and individual eating practices, and previous sources of nutrition information. This information is compared against current recommendations for CKD, and the renal diet is taught to patients as required. Adherence data is unknown, although blood work (potassium, phosphorus, albumin) provides some clues.

- Food and food access concerns may not always be identified during the nutritional assessment, so the dietitian relies on team members (especially social workers and nurses) to identify concerns.

- Screening for food insecurity is not currently conducted. However, the patient may indirectly reveal concerns when mentioning the cost of food, skipping meals, the repeated consumption of certain types of low cost foods, or not being able to afford medication or transportation.

- Currently, if the dietitian suspects that the patient is experiencing food insecurity, the following may be recommended:

    - Referral to Meals on Wheels, especially if they have challenges around food acquisition and preparation.

    - Education on low cost food options will be provided.

    - Referral to good food box programs and/or the food bank. Note that the food bank may not be able to meet the dietary requirements of CKD patients.

    - Referral to social assistance programs that can provide additional funding for special diets (e.g., diet/nutritional supplement, Alberta Works, AISH). Note that not all patients are eligible for this assistance.

    - Referral to the Renal Community Kitchen (RCK). The RCK operates in partnership with the Community Kitchen Program of Calgary. It was developed to help those struggling with both food skills and the complex dietary requirements of CKD. Clients learn food skills (e.g., food preparation, food safety, cooking) and prepare a variety of low cost ($2 or less) meals that meet their complex dietary requirements. While the RCK has been a

rewarding experience for clients, it is a considerable time commitment that can be physically demanding for individuals with CKD. The RCK meets once every six weeks. The program is currently underutilized; only 10 individuals use the RCK on a regular basis.

Michelle Canales Holmes (social worker)

- There are two social workers for the clinic's patient population: 600-800 patients/social worker. Social workers are advocates for patients and can provide them with referral to programs (e.g., food bank, housing support) or with assistance with regards to obtaining time off work to attend clinic visits.

- Patients' initial visit with the social worker includes a complete psychosocial assessment to understand their capacity to cope with treatment. This includes a review of medication, finances, transportation, support, housing, coping skills, mental health (depression, anxiety, suicide risk, etc.), family dynamics, family structure, and social barriers . This interaction is not always in person and may be over the phone. Further contact with patients will depend on patients' desire for assistance and/or referral by the other clinicians in the health care team.

- Barriers to food security among clinic patients are rooted in low income. They include the inability to work as a result of their illness; insufficient social assistance; cost of the renal diet; food access and transportation barriers, especially as disease progresses and patients experience physical challenges and co-morbidities (e.g., leg swelling); culturally-based food preferences that may influence the acceptability of the renal diet; and feeling like a burden for requiring a separate (and costly) renal-friendly meal.

- Establishing trust with patients is important as some patients are initially unwilling to consult with a social worker. Patients may be unaware of the clinicians' scopes of practice and how they may be assisted by the health care team.

- A face-to-face screening tool for food insecurity is plausible with this population, although there may be individuals who do not report any challenges in accessing food due to income even if they are food insecure.

Sandra Anderson (nurse practitioner)

- Nurse practitioners work in outreach clinics. Clients will be referred by their family doctor or nephrologist and will often present with multiple co-morbidities. The goal of these clinics is to preserve clients' quality of life and prevent progress of renal disease. It is also more fiscally responsible to see clients at these clinics rather than in acute care settings.

- There are also clinics that provide outreach to Aboriginal communities. The goal of these clinics is preventative as the population is high risk and isolated. Many clients do not yet have a decline in renal function. Establishing trust in these communities is of utmost importance.

Matt James (physician)

- Patients attending the clinic represent the broad scope of chronic kidney disease, from those at risk to those on dialysis. Thirteen per cent of Albertans have evidence of kidney disease. Many of the risk factors for kidney disease overlap with those for food insecurity, such as low socioeconomic status and being of Aboriginal or African descent.

- Co-morbidities such as high blood pressure and diabetes, metabolic abnormalities, and bone disorders impose many nutritional restrictions for CKD patients. For patients who are in a more advanced stage of CKD, their inability to achieve nutrition recommendations will have a tangible and noticeable impact on their overall wellbeing, including kidney function and risk for infection.

- Clinicians are aware that their patients require challenging, restrictive diets; it is unknown to what extent food insecurity amplifies patients' difficulties in complying with their renal diet.

- Screening for food insecurity in this population and ready identification of resources for supporting food insecure CKD patients are essential.

- Eliminating food insecurity from this population could have an effect on hospitalization rates and disease progression, but the extent is unknown.

The overwhelming impression gained by the Campus Alberta team from hearing from those who work with this highly vulnerable population is that food insecurity is a major problem, if not an indicator of the most severe problems facing those with CKD. For example, we learned that some essential drugs, like phosphate binders, cost upwards of $1,000 per month for households without drug benefit coverage. Drug costs are known to compete with food costs among food insecure clients.[1] We also learned how critical successful disease management was to labour force attachment and how difficult it is to access income support programs. Finally, we learned from our meeting that the health system and its highly qualified providers are well-equipped and have the knowledge and skill-building resources to support CKD patients and their families through dietary guidance, counselling on medication use and management of co-morbid conditions, and social work supports. Nonetheless, adherence is compromised in the face of food insecurity.

Knowledge Café

A knowledge café is a simple means for a group of people to have an open, creative conversation on a topic of mutual interest to gain a deeper collective understanding of the subject and the issues involved. The host from each group summarizes the highlights from the first group's discussion for the second group, allowing the second group to build on

[1] Berkowitz SA, Seligman HK, Choudhry NK. Treat or Eat: Food insecurity, cost-related medication underuse and unmet needs. Am J Med. 2014 doi:10.1016/j.amjmed.2014.01.002

what those before them have discussed. For more information on knowledge cafés, please see http://www.theworldcafe.com.

Each participant had the opportunity to participate in two group sessions. The three session topics were as follows:

1. What would make screening in the CKD population feasible? [Screening]
2. If a person living with chronic kidney disease is identified as food insecure, then how might we respond in practice? [Practice/Intervention]
3. What would it take to get this type of research funded as a Strategic Clinical Network [SCN] priority for the Partnership for Research and Innovation in the Health System [PRIHS] competition? How could we move forward with this? [Research]

The key themes identified from the knowledge café conversations on these three topics (screening, practice/intervention, research) are briefly highlighted below.

Café #1: What would make screening in the CKD population feasible?

- Screening must be integrated into current practice without overburdening any healthcare professional.
- Initial assessment is an ideal time for screening since patients may not be seen frequently during the year.
- The dietitian is the ideal health professional to deliver a screening tool as part of their initial assessment with all new patients (except general nephrology patients, who only see the physician). This will also make their interaction more targeted and thus more efficient, i.e., not overly burdensome.
- Clinicians need to know what interventions and referrals exist if a patient is screened as food insecure. Current referral practices that exist if food insecurity is suspected need to be documented so that clinicians can easily refer to this information.
- A screening tool and responses should be integrated within PARIS. This will help all members of the healthcare team provide a tailored treatment plan and appropriate counselling.
- A formalized screening process including documentation and presentation to staff will be required.
- Educating staff on the impact of food insecurity for this CKD population is essential and can ease concerns around confidentiality.

- HFSSM (12- or 3-month) should be used.

Café #2: If a person living with chronic kidney disease is identified as food insecure, then how might we respond in practice?

- Income-based strategies that prevent food insecurity:
    - Income assistance for food, medications, transportation, and housing is required.
    - Advocate for poverty reduction in general, as it will assist the CKD population.
- Evidence-based, multi-level initiatives and programs are needed. This includes the enhancement of current programs (e.g., community kitchens, food banks) so that they are health- and culturally appropriate and do not present transportation and/or access barriers.
- Evaluate current and future programs and initiatives for effectiveness. Knowledge translation is required regarding initiatives that work.
- Educate patients on low cost food provisioning skills.
- Competence and sensitivity training regarding food insecurity with dietitians.
- Food costing in Alberta.
- Develop a renal food hamper for distribution at the food bank.
- Expand the community kitchens program.
- Target corporate social responsibility programs.
- Provide alternative clinic hours to those unable to get time off from work.
- Ask clients what they need and how the health professionals at the clinic can help.

Café #3: What would it take to get this research funded as a SCN(s) priority for the PHRIS competition? How could we move forward on this?

- What would be the therapeutic impact of removing food insecurity from the lives of people with CKD attending the clinic?
- CKD is an ideal disease to target because it is expensive and underfunded, has a lot of co-morbidities, and is socially "acceptable" (versus HIV/AIDS for example). It also is a disease where diet and nutrition are essential for treatment and slowing disease progression.
- Example of study design:
    - Identify individuals who are currently in the system and screen positive for food insecurity (especially severe food insecurity) and have less than 30% renal function.

    - Assess all study participants for their complex needs.
    - Conduct an intervention (see below) → Guaranteed Annual Income/medication coverage.
    - Record results in PARIS.
    - Compare to a similar group in the Northern Alberta Renal Program (NARP) and conduct a value/cost and wellbeing analysis. Scale up results.

- Possible ways to demonstrate effectiveness, i.e., cost savings, within the time frame of the study (3 years):
    - Decreased or lack of disease progression
    - Increased labour force attachment
    - Decreased health care utilization
    - Dialysis avoidance
    - Increase in living donor transplants
    - Better diseases self-management
- Note that food insecurity does not demonstrate malnutrition.
- Interventions that could be targeted by this innovation initiative:
    - Obtain funding for additional social workers
    - Increase social assistance rates and ability to access social assistance
    - Enhance the diet/nutrition supplement program
    - Improve current food programs (e.g., Meals on Wheels, food hampers) so that they are renal-friendly
    - Provide financial and housing support to those who are using the lower-cost treatment options (home- and peritoneal dialysis)
    - Advocate for a Guaranteed Annual Income (GAI)
    - Try to learn more from CKD patients about why they may be food insecure and their needs
- Guaranteed Annual Income is the preferred intervention.

- Dignified solution to food insecurity
- Community-based initiatives are inadequate to alleviate or eliminate food insecurity in low income populations
- GAI = $15,700 per year

Closing Remarks and Moving Forward

Considerable progress was made on both questions of the day. The panel presentations from both the Campus Alberta and the SARP team were critical in bridging gaps between research and practice knowledge and generating critical discussion on the three knowledge café questions. All those in attendance were thanked for their participation and attendance at the meeting.

As a result of this meeting and the insights gained therein, a letter of intent (LOI), *Addressing food insecurity in the chronic kidney population for cost savings*, was successfully submitted to the Alberta Innovates-Health Solutions PRIHS LOI competition. The submission summary can be found in Appendix C.

A quasi-experimental project design will be developed through the engagement of Southern and Northern Alberta Renal Program leadership and front-line staff, and an advisory group of patients. It will involve identifying CKD patients who would be eligible for all or some of the intervention components (GAI, essential medication coverage, enhanced case management) through food insecurity screening and comparing their health status, health care utilization, employment outcomes, and direct costs and savings over three years compared with CKD patients with similar needs who do not receive the intervention. We will also compare the outcomes and costs for intervention CKD patients with CKD patients receiving usual care. We expect that the intervention will pay for itself even after accounting for study, income supplementation, and drug costs.

A full grant application is due August 8, 2014 and the Campus Alberta group is currently preparing this proposal.

Appendix

A. Background Reading Materials

Household Food Insecurity Prevalence in Canada and Alberta

The Canadian Community Health Survey provides current data on household food insecurity using a standard multiple-indicator measure of household food insecurity termed the Household Food Security Survey Module (HFSSM).

Recent data on Canadian and Albertan Prevalence:

- 12.6% of Canadian households or about 1.7 million households were food insecure in 2012. About 4.1% experienced marginal food insecurity, 6.0% moderate food insecurity, and 2.6% experienced food insecurity at the severe level. (Tarasuk et al, 2013)

- 11.5% (down from 12.3% in 2011) of Albertan households reported experiencing food insecurity in 2012; levels of food insecurity were 3.8% marginal, 5.8% moderate and 2.0% severe (Tarasuk et al, 2013)

- Adults living in household living arrangements identified as "lone parent households" were particularly vulnerable to food insecurity, with 34.3% of female lone parents and 17.2% of male lone parents reporting some level of food insecurity (Tarasuk et al, 2013).

Implications for Health and the Management of Chronic Disease

Possible health consequences of household food insecurity:

- Poorer nutrient intakes and a higher risk of nutrient inadequacies than individuals living in food secure households (for adolescents and adults) (Kirkpatrick & Tarasuk, 2008).

- Self-reported poor/fair health, physical limitations, mental health problems, diabetes, heart disease and other chronic conditions (Che & Chen, 2001; Gucciardi et al, 2009; Seligman et al, 2010a; Vozoris & Tarasuk, 2003); vice versa, the presence of chronic health conditions may increase vulnerability to household food insecurity (Tarasuk et al, 2013)

- Studies of clinical populations show high rates of food insecurity among certain groups of individuals accessing health care including people with diabetes (Galesloot et al, 2012; Nelson et al, 1998;), cancer (Simmons et al, 2006) and HIV-positive/AIDS (Normen et al, 2005).

Impacts of household food insecurity on the management of chronic disease:

- Higher prevalence of food insecurity among hemodialysis group compared with the general population; for example,16.3% of hemodialysis patients undergoing treatment in 3 Louisiana dialysis centers were food insecure, compared to the national average of 10.7% in that year (Wilson et al, 2006)

- Food insecurity in adults with diabetes mellitus in the United States has been associated with more frequent hypoglycemic episodes (Seligman et al 2010b), poorer self-management (Seligman et al 2010b), increased need for health services (Seligman et al 2010a), and increased use of physician services (Nelson et al 2001).

- Analysis of U.S. population-level data indicates a graded relationship between food insecurity and the odds of having diabetes: more severe food insecurity is associated with higher risk of Type II diabetes, independent of BMI (Seligman et al, 2007).

Further Reading:

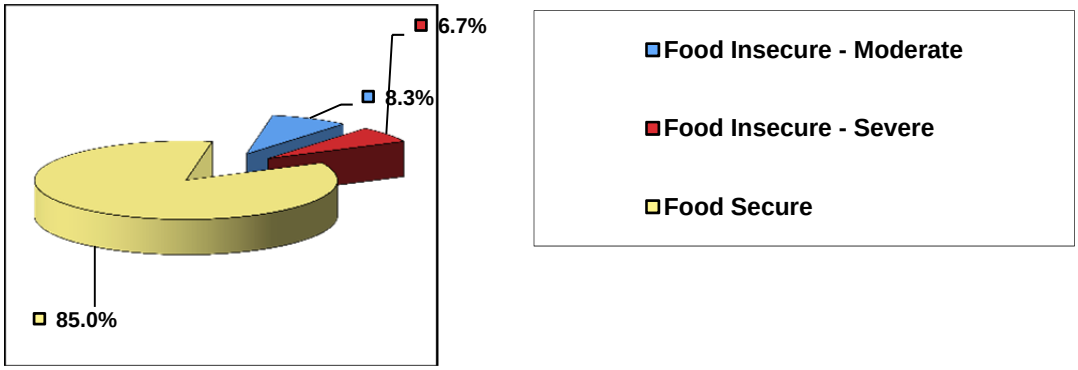
Tarasuk, V, Mitchell, A, Dachner, N. (2013). Household food insecurity in Canada 2012, Toronto. Available from http://nutritionalsciences.lamp.utoronto.ca/annual-report-2012/

Local research: Food Insecurity in a Health Care Setting

Calgary Diabetes Outpatient Clinics: Diabetes, Hypertension and Cholesterol Centre

- Clinic prevalence rate of total food insecurity is more than 2.5 times higher than that seen in the general population

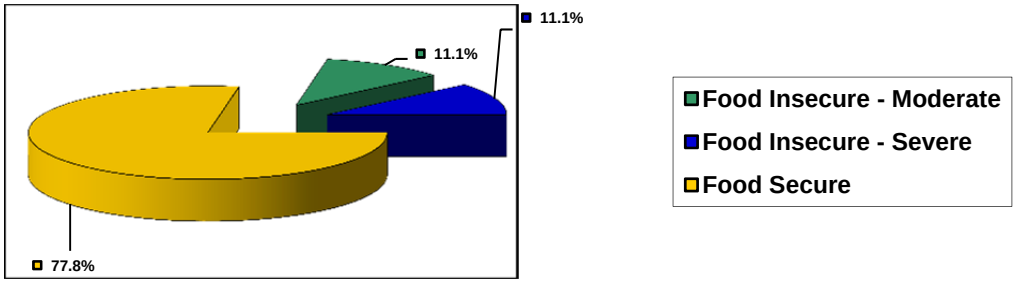
- Clinic prevalence rate of severe food insecurity is more than 4 times higher than the Canadian and Alberta prevalence rates



A situation of severe food insecurity unequivocally has implications for the ability of this population to follow a recommended pattern of healthy eating necessary for effective management of diabetes and can be expected to place this population at risk for poor disease control and for adverse health episodes such as hypoglycemic incidents.

Calgary-based Southern Alberta Clinic (SAC): Servicing patients with HIV/AIDS

- Clinic prevalence rate of *total* food insecurity is 2.5 to 3 times higher than that seen in the general population.
- Clinic prevalence rate of *severe* food insecurity is more than 6 times higher than the Canadian and Alberta prevalence rates



Clients experiencing severe food insecurity had significantly poorer clinical markers than those who are food secure.

Best Management Practices for food insecure patients/clients (preliminary review):

1. consistent, systematic identification of food insecurity among individuals/patients accessing the health system
2. institutional support for linking patients to reliable food access programs
3. tailored nutrition education using low cost solutions for improving disease outcomes (e.g., for improving glycemic control in food insecure patients with diabetes).

Our CIHR-funded scoping review of food insecurity in the healthcare setting will be examining the best available literature on screening for individual food insecurity.

References

Che, J., & Chen, J. (2001). Food insecurity in Canadian households. *Health Reports, 12*, 11-22.

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

Gucciardi E, Vogt JA, DeMelo M, Stewart DE. (2009). Exploration of the relationship between household food insecurity and diabetes in Canada. *Diabetes Care*;32(12): 2218-2224.

Kirkpatrick, S., & Tarasuk, V. (2008). Food insecurity is associated with nutrient inadequacies among Canadian adults and adolescents. *Journal of Nutrition, 138* (3), 604-612.

Nelson K, Cunningham W, Anderson R, et al. Is food insufficiency associated with health status and health care utilization among adults with diabetes? *J Gen Intern Med* 2001; 16: 404-411.

Normen L, Chan K, Braitstein P, Anema A, Bondy G, Montaner J, Hogg R. Food Insecurity and hunger are prevalent among HIV-positive individuals in British Columbia, Canada. *The Journal of Nutrition*. (jn.nutrition.org December 15, 2008)

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 Jul; 22(7):1018-23.

Seligman HK, Laraia BA, Kushel MB. (2010a). Food insecurity is associated with chronic disease among low-income NHANES participants. *Journal of Nutrition*; 140(2): 304-10.

Seligman HK, Davis TC, Schillinger D, Wolf MS. (2010b). Food insecurity is associated with hypoglycemia and poor diabetes self-management in a low-income sample with diabetes. *Journal of Health Care for the Poor and Underserved*;21(4): 1227-1233

Simmons LA, Modesitt SC, Brody AC, Leggin AB. Food insecurity among cancer patients in Kentucky: A pilot study. *Journal of Oncology Practice* 2006; 2(5): 274-279.

Tarasuk V, Mitchell A, McLaren L, McIntyre L. (2013). Chronic physical and mental health conditions among adults may increase vulnerability to household food insecurity. Journal of Nutrition : DOI: 10.3945/jn.113.178483.

Vozoris, N., & Tarasuk, V. (2003). Household food insufficiency is associated with poorer health. *Journal of Nutrition, 133,*120-126.

Wilson G, Molaison EF, Pope J, Hunt AE, Connell CL. (2006). Nutritional status and food insecurity in hemodialysis patients. *Journal of Renal Nutrition*; 16(1): 54-58.

B. Participant List

Southern Alberta Renal Program (SARP), Sheldon M Chumir Health Centre (SMCHC)

Dr. Carolanne Nelson^	Manager, Nutrition Services, Primary Care and Chronic Disease Management, SARP, Diabetes, Weight Management, Osteoporosis
Dr. Matt James	Physician, SARP Chronic Kidney Disease (CKD)
Kin Tam	Unit Manager, Manager SARP Chronic Kidney Disease
Sandra Anderson	Nurse Practitioner
Lia Sauvé	Dietitian
Michelle Canales Holmes	Social Worker

Academics

Dr. Lynn McIntyre*^	Professor, Department of Community Health Sciences, Population Health and Inequities Research Centre (PHIRC), Cumming School of Medicine, University of Calgary
Dr. Anna Farmer*^	Associate Professor, Community and Public Health Nutrition, Department of Agricultural, Food and Nutritional Science & Centre for Health Promotion Studies, University of Alberta
Dr. Valerie Fleisch*^	Notetaker, Scoping Review Coordinator, Department of Community Health Sciences, Cumming School of Medicine, University of Calgary
Dr. Laura Anderson^	Notetaker, Post-Doctoral Fellow in Food Insecurity Policy, Department of Community Health Sciences, Cumming School of Medicine, University of Calgary
Krista Rondeau	Notetaker, Research Associate, Department of Community Health Sciences, Cumming School of Medicine, University of Calgary
Dr. Gail MacKean^	Facilitator
Ana Medrano	Notetaker, Graduate Student, University of Alberta

Alberta Health Services, Nutrition Services

Carlota Basualdo-Hammond*^	Executive Director, Provincial Strategy, Standards and Practice, Nutrition Services
Sheila Tyminski*^	Director, Population and Public Health Strategy, Nutrition Services
Suzanne Galesloot*^	Public Health Nutrition Provincial Lead, Population and Public Health, Nutrition Services
Janet Stadnyk^	Director, Primary Care and Chronic Disease Strategy, Nutrition Services
Lorna Driedger^	Director, Nutrition Services, Calgary Zone

Alberta Health Services, Public Health

Dr. Richard Musto*^	Medical Officer of Health, Calgary Zone

Alberta Health

Patricia Martz*^	Project Manager, Acute Care and Population Health

Alberta Health Services, Research and Innovation in Surveillance and Infrastructure, Population and Public Health

Dr. Deborah McNeil^	Director

Strategic Clinical Network Obesity, Diabetes and Nutrition

Dr. Jeff Johnson	Scientific Director
Bretta Maloff	Vice President
Dr. Alun Edwards	Senior Medical Director

Alberta Government department invitees, e.g., Human Services, Enterprise and Advanced Education

Kelly Santarossa	Senior Policy Advisor, Strategic Policy, Human Services
Heather Gagnon	Family Care Clinic Unit, Policy Analyst

*Indicates *Campus Alberta Food Insecurity in Health Setting Group* member
^Indicates planning committee member

C. Summary of PRIHS research project, *Addressing food insecurity in the chronic kidney population for cost savings*

There is overwhelming evidence that poverty adversely affects health. Burden of disease studies consistently show that those with low socioeconomic status suffer from poorer health, report more chronic disease, and consume more health care resources (1). One important, and unique, marker of material deprivation is household food insecurity, which is defined as insecure or inadequate access to food due to financial constraints (2). Adults living in food insecure households are more likely to report physical limitations, mental health problems, diabetes mellitus, heart disease, other chronic conditions, and self-reported poor/fair health (3-6). Recent studies have explored the disease management consequences of food insecurity among those with chronic conditions accessing the health care system (7,8). Health care practitioners caring for individuals of lower socioeconomic status are likely to encounter food insecure clients, yet with the exception of initiatives like Housing First that focus on the most vulnerable populations such as the homeless (9), the health gains and costs avoided by dealing with underlying poverty as manifested by food insecurity have not been ascertained. The proposed study is a social innovation experiment in the healthcare setting that seeks to achieve health gains at net savings for a high cost/high morbidity/high needs chronic disease population; namely, those with chronic kidney disease.

Innovation Question: Compared with usual care through a chronic kidney disease clinic serving persons who are Stage 4 kidney disease[2] and who are identified as food insecure, will a Guaranteed Annual Income (GAI) and essential medication coverage, coupled with enhanced case management, lead to: a) significantly slowed kidney disease progression; b) significantly delayed onset of dialysis; c) significantly improved co-morbidity outcomes; d) significantly reduced health care utilization; e) significantly better labour force attachment; and f) overall net cost savings to both Alberta Health Services and to the Province of Alberta as a whole?

The sponsors of this cross-cutting initiative are the Alberta Health Services (AHS) Kidney and Obesity, Diabetes and Nutrition Strategic Clinical Networks. Leadership for implementation is the Campus Alberta Food Insecurity in Health Settings group working in partnership with the Southern Alberta Renal Program and with the support of the Northern Alberta Renal Program. This is a proposal based on the principle of leverage—with this funding we will seek to leverage external funds for the Guaranteed Annual Income and essential medication coverage components of the innovation.

The project is aligned with Alberta's Social Policy Framework, which is focused on reducing inequality, protecting vulnerable people, producing a person-centered system of high quality services, and enabling collaboration and partnerships. It is also strongly aligned with the Framework's strategic directions of transforming systems to produce better

[2] Glomerular filtration rate (GFR) less than 30 mL/min/1.73m2

outcomes and innovation that uses policy as an outcome-based tool. The project is similarly aligned with AHS Health Plan and the plan's: concern with complex, chronic disease; goal to build a system that is patient-centred, driven by outcomes and informed by evidence; and its intent to work across Ministries and develop innovative service models. On completion, the project is designed to meet the objectives of the Partnership for Research and Innovation in the Health System (PRIHS) funding opportunity with respect to: improving care and value for money resulting in measurable cost-savings in AHS; support high value research in the health system focused on efficiency, effectiveness, appropriateness, acceptability, and accessibility.

Insights into Food Insecurity and other Disadvantage in the CKD Population

A recent US study has shown that food insecurity may contribute to disparities in chronic kidney disease, especially among persons with co-morbid diabetes or hypertension (10). Food insecurity in this population is understudied, although given the prominence of diabetes in the CKD population, it is likely that our study of food insecurity among attendees at a mainstream diabetic clinic in Calgary is informative. We found that food insecurity measured by an internationally validated scale was two-fold greater in the diabetic clinic population than in the Alberta population as a whole and that severe food insecurity, associated with food deprivation, was three-fold higher (3). This type of work has not been reproduced elsewhere although we received inquiries from a SARP dietitian as early as 2010 to examine food insecurity in the population she served. The CKD population is also worthy of consideration of the implications of food insecurity given the clinical importance of adherence to the costly renal diet, essential medication costs used to prevent or slow down kidney disease progression, and the very high costs of end-stage chronic kidney disease treatment including dialysis.

On February 28, 2014, courtesy of a Campus Alberta Health Outcomes and Public Health meeting grant, 30 stakeholders gathered to consider the problem of food insecurity within the CKD population in Southern Alberta (specifically within the Southern Alberta Renal Program's Sheldon Chumir CKD clinic). Attendees included clinicians and staff from the Southern Alberta Renal Program, Alberta Health Services clinicians, decision-makers working in nutrition services, chronic disease management, and public health, researchers from the Universities of Calgary and Alberta, all senior staff of the Obesity, Diabetes, Nutrition Strategic Clinical Network, and other non-AHS government departmental representatives from Health and Human Services. The overwhelming impression we gained from hearing from those who work with this highly vulnerable population is that food insecurity is a major problem, if not an indicator of the most severe problems facing those with CKD. In our meeting, for example, we learned that some essential drugs, like phosphate binders cost upwards of $1000 per month for household without drug benefit coverage. Drug costs are known to compete with food in food insecure clients (11). We also learned how critical successful disease management was to labour force attachment, and how difficult it is to access income support programs. Finally, we learned from our meeting that the health system and its highly qualified providers are well-equipped and have the knowledge and skill-building resources to support CKD patients and their families through

dietary guidance, counseling on medication use and management of co-morbid conditions, and social work supports; yet adherence is compromised in the face of food insecurity.

The healthcare system's efforts to assist its food insecure clients with costly chronic conditions are thwarted at best—rendered ineffective at worst—if this problem is not tackled via income solutions.

Three Intervention Elements: Guaranteed Annual Income, Essential Drug Coverage, and Enhanced Case Management

GAI is money paid by government to eligible persons with few, if any, conditions attached (e.g., residency). Notably, there is no work requirement. In general, GAI is superior to other forms of income support in being non-stigmatizing, more administratively- and cost-efficient, and yielding higher returns in terms of poverty and social inequality reduction. The health benefits of basic income previous pilot projects in Canada have been impressive (12). There is considerable momentum across Canada for GAI experiments (see The BIG Push Campaign) and members of our team have recently published showing a halving of food insecurity prevalence (13) and sustained health and mental health benefits of the $14,708 Old Age Security/Guaranteed Income Supplement income floor for seniors in Canada (14).

In addition to GAI funding, we would seek Alberta Health support for essential drugs necessary for CKD patients to be provided free of charge through a supplement to the provincial drug formulary for those without drug coverage, for the duration of the three year experiment. We will have an arm's length assessor's (e.g., from Income Supports) review of personal income and for eligible recipients, automatic twice a month receipt of income bringing annual income up to the OAS/GIS floor of $14,708 plus an arrangement to receive essential medications without charge for those without full benefits (for co-payers, reimbursement of co-pay amount).

We will also add a 'best practices' case management component to the intervention so that we can maximize health status benefits from increased adherence to recommendations for this population and thereby maximize cost-savings. The $390,000 of other personnel costs in the $750,000 proposed budget is for 0.5 FTE additions to social work, dietetics and clinical nurse specialist practitioners.

Our quasi-experimental project design will be developed through the engagement of Southern and Northern Alberta Renal Program leadership and front-line staff, and an advisory group of CKD clients. We will identify eligible participants among Stage 4 CKD clients who are found to be food insecure using a validated tool that measures marginal, moderate and severe food insecurity (15,16). These clients will be matched 2:1 by age, sex, education, and renal function +/-20% of glomerular filtration rate with food secure clients at the same clinic; and 2:1 matched on the same specifications with non-Chumir Southern Alberta Renal Program unscreened clients; matching with Northern Alberta Renal Program clients who use similar but not linked databases will be considered. Fortunately baseline

and follow up data necessary for health outcome evaluation can be extracted from PARIS (patient-based renal information system), AB Netcare, and Clinibase. The attached value for money plan justifies our 30% estimate of food insecurity and 40-50% effect size assumptions for the study. It is worth stating however, that the problem that we are tackling is big and our expected results are huge.

Feasibility

If this letter of intent is supported, we will seek GAI funding from the recently announced Social Innovation Endowment Fund at http://humanservices.alberta.ca/social-innovation-fund.html. The $1B fund supports transformative ideas, risk-sharing, and creative collaborations. This might in turn be leveraged with support from the Social Research and Demonstration Corporation (a non-profit research organization) http://www.srdc.org/) and our links with the Basic Income Canada Network. If successful in receiving commitment for this funding, estimated at $2.8M, we do not foresee a problem with Alberta Health's contribution to this initiative being extended drug coverage to those below age 65 who have no other drug benefit support.

Team Capability

Our group was initiated in 2007 and has grown since that time to include the long list of collaborators who appear in this proposal. We have overseen a number of food insecurity in health settings projects, received CIHR funding, and have the expertise, commitment, diverse representation and reach necessary to both leverage the PRIHS funding opportunity to support the three intervention components and execute this important social innovation experiment for healthcare savings.

Sustainability and Future Work

It is anticipated that the proposed intervention strategy would be examined as a proof of principle concept in the CKD population. If successful, we would seek to sustain it through a reform to Assured Income for the Severely Handicapped (AISH) [CKD-AISH] at the GAI level for this population. We would first scale the intervention up to the Northern Alberta Renal Program and the other Southern Alberta Renal Program sites for Stage 4 renal failure and then proceed to conduct benefits realization involving rigorous assessment of value for money with spread of this intervention. Following intervention would be similarly tested in other renal disease populations including Stage 2 and 3, dialysis, the post-kidney transplant population, diabetics with persistently high HbA1C and proteinurea, and persons with HIV/AIDS. These are chronic disease populations where the proposed intervention may be warranted in terms of impact, cost savings, and improved quality. Ultimately, we expect this initiative to be taken up by governments in a more universal fashion.

References

1. Public Health Agency of Canada. The Chief Public Health Officer's Report on the State of Public Health in Canada 2008. Ottawa ON: Minister of Health; 2008. Report No.: Cat.: HP2-10/2008E.

2. McIntyre L. Food insecurity policy is not the flip side of food security policy. Policy Options 2011;32(7): 48-51

3. Galesloot S, McIntyre L, Fenton T, Tyminski S. Food insecurity among Canadian adults receiving diabetes care. Can J Diet Prac Res 2012; 73(3): e261-e266. DOI: 10.3148/73.3.2012.e261

4. Seligman HK, Laraia BA, Kushel MB. Food insecurity is associated with chronic disease among low-income NHANES participants. J Nutr 2010;140(2):304-10.

5. Gucciardi E, Vogt JA, DeMelo M, Stewart DE. Exploration of the relationship between household food insecurity and diabetes in Canada. Diabetes Care 2009;32(12):2218-2224.

6. Tarasuk VS, Mitchell A, McLaren L, McIntyre L. Chronic physical and mental health conditions among adults may increase vulnerability to household food insecurity: Inferences from the Canadian Community Health Survey. J Nutr November 2013 jn.113.178483; first published online August 28, 2013. doi:10.3945/jn.113.178483

7. Sawka AM, Boulos P, Talib AS, Gafni A, Thabane L, Papaioannou A, Booth G, Gerstein HC. Low socioeconomic status and increased risk of severe hypoglycemia in type 1 diabetes: a systematic literature review. Can J Diabetes 2007;31(3):233-241.

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

9. Greenwood RM, Stefancic A, Tsemberis S. Pathways Housing First for homeless persons with psychiatric disabilities: Program innovation, research, and advocacy. J Social Issues 2013;69(4):645-663.

10. Crews DC, Kuczmarski MF, Grubbs V, Hedgeman E, Shahinian VB, Evans MK, Zonderman AB, Burrows NR, Williams DE, Saran R, Powe NR. Effect of food insecurity on chronic kidney disease in lower-income Americans. Am J Nephrol 2014;39(1):27-35.

11. Berkowitz SA, Seligman HK, Choudhry NK. Treat or Eat: Food insecurity, cost-related medication underuse and unmet needs. Am J Med. 2014 doi: 10.1016/j.amjmed.2014.01.002

12. Forget E. The Town with No Poverty: The health effects of a Canadian Guaranteed Annual Income field experiment. Can Public Policy 2011;37(3):283-305.

13. Emery JCH, Fleisch VC, McIntyre L. Legislated changes to federal pension income in Canada will adversely affect low income seniors' health. Prev Med 2013: 57(6): 963-966

14. Emery JCH, Fleisch VC, McIntyre L. How a Guaranteed Annual Income could put food banks out of business. SPP Research Papers University of Calgary School of Public Policy December 2013, 2013: 6(37): 1-20 http://www.policyschool.ucalgary.ca/sites/default/files/research/emery - foodbankfinal.pdf

15. 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.

16. Tarasuk, V, Mitchell, A, Dachner, N. (2013). Household food insecurity in Canada 2012, Toronto. Available from http://nutritionalsciences.lamp.utoronto.ca/annual-report-2012/

17. Tarasuk VS, Mitchell A, McLaren L, McIntyre L. Chronic physical and mental health conditions among adults may increase vulnerability to household food insecurity: Inferences from the Canadian Community Health Survey. J Nutr November 2013 jn.113.178483; first published online August 28, 2013. doi:10.3945/jn.113.178483

18. Olabiyi OM, McIntyre L. Determinants of food insecurity in higher-income households in Canada. J Hunger Environ Nutr, in press.