Evaluating the implementation and impact of an online tool used within primary care to improve the income security of patients with complex health and social needs in Ontario and Manitoba

1. Overview

Social conditions that impact the health of individuals have been labeled the social determinants of health (SDOH) and include a person's income security, food security, housing status and educational attainment. [1, 2] This project occurs in the context of a growing number of calls for evidence to inform interventions that address SDOH. [3-5] Our objective is to conduct an implementation evaluation of an online tool that addresses income security at several primary care sites and to assess the short-term impact on patients. This tool works by prompting the health provider to screen for poverty, and if identified, to recommend benefits or other financial resources, as well as local community resources to assist with obtaining these benefits. Using continuing medical education materials that have been created by study team members, we will introduce the concept of screening for poverty and intervening to six clinic sites. We will collect input from these sessions to inform the development of the tool. We will form patient advisory groups in Toronto and Winnipeg to provide input on the tool as well. We will then pilot the tool in the six primary care clinics and collect immediate feedback from patients when they finish using the tool. After the tool has been in use for three months we will send online surveys to all providers at the six clinics and invite them to participate in focus groups. Finally, we will follow-up with patients at one month after they complete using the tool, using a telephone survey, to collect further input and get a sense of how its use had an impact on their knowledge of benefits and ability to access them. Data collected at each point will inform the ongoing refinement and development of the tool.

Relevance to cross-jurisdictional priority research areas: SDOH are relevant to caring for patients with complex health and social needs. For example, Ontarians who are in the top 1% and top 5% of health service use (labeled "high-cost health care users") [6] are significantly more likely to be low-income, a relationship that persists despite controlling for other key factors including age. [7] More recent work by the Health Analytics Branch of the Ontario Ministry of Health and Long-Term Care has found that living in an area with high material and social deprivation is a significant predictor of becoming a high-cost health care user. [8] However, interventions to address SDOH are lacking. This project aims to address this gap, as well as develop new knowledge of how to address SDOH in clinical settings for all patients.

How this project is both novel and innovative: Building on work to date, we will evaluate the implementation of an online tool that assists primary care providers in addressing income security as a high-impact intervention on a key social determinant of health (SDOH). This online tool is currently at the very early stages of development, in partnership with Prosper Canada, a national charitable organization that has a mandate to improve financial literacy and has experience in designing and implementing similar online tools. This new online tool will be modified for use in Ontario and Manitoba in close consultation with patients and providers. It will help providers to screen patients for income insecurity, recommend benefits or other financial resources and then connect the patient to local benefit programs and resources, such as community agencies, financial literacy coaching, tax clinics and free services.

2. Study questions

a) Do health providers find using a tool to address income security in a clinical setting both feasible and acceptable?
b) What are the lessons learned and the opportunities identified when implementing an online tool to address income security within the regular workflow of primary health care organizations? What are the jurisdictional or context specific concerns encountered?
c) What is the perspective of patients on using an online tool to address income security in a primary care setting and what is the short-term impact on awareness of benefits and community resources?

3. Background and significance

The social conditions that impact the health of individuals have been labeled the social determinants of health (SDOH). These are "the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels". [1] Perhaps the most important SDOH is income security, a person's actual, perceived and expected income. [9] Numerous studies confirm that income is a key determinant of health. In every society studied, the poor tend to live shorter lives, experience a greater burden of disease and disability, and rate their health status as worse than the wealthy. [10-16] Income influences the presence and severity of most health conditions. Across population groups, and across time, the income-health link is robust. Material deprivation appears to be a key factor. Living in poverty means being unable to buy basic necessities such as healthy foods [17-19] or pay the rent. [20] Some of the poorest citizens – those reliant on social assistance – have been shown to have worse health and be at greater risk of food insecurity than those with other income sources. [21]

Both the Ontario Medical Association [5] and the Canadian Medical Association (CMA) [4] have called for the development of new evidence around interventions to address poverty as a health issue. In 2013, in partnership with several media organizations, the CMA conducted a series of town halls across Canada on the topic of "Health care in Canada: What makes us sick?" One of the twelve recommendations that developed from this initiative was, *"That local databases of community services and programs (health and social) be developed and provided to health care professionals, and where possible, targeted guides be developed for the health care sector."*[22]

Research from Ontario on patients with complex health and social needs (i.e. the top 1% and 5% of health care users) has demonstrated that having low income is a strong predictor of becoming a "high-cost user" (HCU). Even after adjusting for age, sex and comorbidities, income security – and related factors such as food security and housing – was a key predictor of health care use. [7] As the authors noted, "knowledge of the upstream determinants of HCU, particularly those that are non-clinical in nature, such as SES and health behaviors, is desperately lacking". [7, p.6]

Interventions to address SDOH are rarely found within our health care system. This is a gap within community-based primary health care, which has a mandate to provide preventative medicine, deliver health promotion and serve the needs of vulnerable communities. [23] While the public health sector has encouraged the implementation of interventions that target low-income

individuals, these are mainly focused at the community-level. [24] We are not aware of any Canadian examples of systematic individual-level interventions that have been implemented to improve income security. Manitoba has made significant progress in developing the tools to address poverty within the health care setting building on the tools developed in Ontario but the tools have not yet been implemented. Anecdotal evidence suggests the positive impact of increased income on patients' health but, as yet, there is no rigorous research evidence in Canada to confirm these claims. However, evidence does exist from other jurisdictions. Welfare benefits advice services have been active for two decades in the United Kingdom. Many of these operate within, or in collaboration with, primary care health care practices. [25-27] Research has shown that recipients of these services tended to be older, more likely to have a disability or long-term illness, and to rely on welfare benefits as their main source of income, [28] hence situating the provision of this advice in primary health care appears to be acceptable and feasible. [29, 30] A systematic review of the literature, mostly from the United Kingdom, concerning welfare advice found that it increased the income of recipients, although improvements in health were not captured in most studies. [31]

Financial advice programs in Toronto are well established in some non-primary care settings, such as the Financial Advocacy and Problem Solving service run by St. Christopher House. [32] This program offers expert financial "problem solvers" who work with clients to maximize their income supports, financial literacy, and financial independence. The program also actively promotes the development of similar programs through other agencies and engages in policy advocacy and community development initiatives to address income inequality. According to their internal 2010 evaluation, in that year they served 2,334 clients and their clients accessed more than $4.5 million in additional funds through the use of their services.

An additional example from Toronto is the work of Street Health in assisting the homeless with applying to the Ontario Disability Support Program (ODSP). In 2005, in collaboration with lawyers, physicians and allied health professionals and a number of organizations, Street Health staff worked with 85 homeless individuals to submit applications for ODSP. This built on previous examples of such assistance programs. The majority had multiple physical and mental health conditions. Of these, 70% needed significant help in overcoming barriers to applying for this additional income, such as the 90-day time limit to apply, accessing a physician to complete an assessment, completing forms and keeping in touch throughout the process. Over 90% of individuals were eventually successful in their application, with the supports provided. [33]

It is challenging to estimate the need for such income security interventions. However, many low-income individuals do not file taxes, so miss out on substantial income available through tax benefits. Estimates from the Ontario Ministry of Community and Social Services indicate that social assistance recipients can increase their annual income by 10-50% through tax filing alone. [34] Many do not access other eligible government income benefits. Screening to identify patients living in poverty, and to assist those who would benefit to tax file and access other benefits is, therefore, an effective and rapid means of boosting incomes.

Existing tools and approaches to improve income security within health care settings
Distributing a paper-based tool focused on poverty and health

Dr. Gary Bloch (Co-Applicant on this project), in collaboration with other health professionals, developed a simple tool for practitioners to screen patients for poverty, adjust their health risk assessment accordingly and intervene to increase income. [35] Specific interventions that are recommended include identifying if the patient has filed his or her taxes and obtained tax credits, identifying other government income benefit programs patients may be eligible for but not accessing, and referring patients to community and online supports and resources to help them access benefits. This tool has been adapted for, and is being piloted in, Manitoba, British Columbia and Nova Scotia. In Manitoba, there have been a range of ideas developed for distributing this information, which will soon be hosted on the Manitoba Health, Healthy Living and Seniors (Government of Manitoba) website. In addition, an active group of policy, research and practice experts (including Co-Applicants on this project) have been planning to upscale the initiative through electronic medical record (EMR) links, the medical training curriculum and a comprehensive approach for evaluating impact.

Providing a resource book to address social needs
A study conducted in Baltimore at a large urban hospital-based pediatric clinic examined the impact of using a brief screening tool to identify social needs within ten domains, and then provide patients with a tear-out that contained information about a relevant community-based resource. Led by Dr. Arvin Garg, the Well-child Care Visit, Evaluation, Community Resources, Advocacy, Referral, Education (WE CARE) Study found that this intervention increased the odds that a parent would contact a community resource, and most involved reported it added less than 2 minutes to the visit. [36]

Developing a volunteer advocate program to address social needs
Several programs exist whereby patients are screened for social needs and volunteers assist in connecting these patients with community resources. For example, the Health Leads Program, which began in Boston and now exists in many locations throughout the USA. At the core of this intervention is the action of doctors, nurses and social workers to "prescribe" basic resources such as income, food and heat. A team of advocates "fill" these prescriptions by connecting patients with community resources and support programs. These advocates are volunteers who are trained to access such resources and are based in health care settings. While outcome studies have not been performed on this program, the uptake has been remarkable with 7,000 volunteers having served 23,000 patients since 2010. [37] A prospective study of Health Leads by Dr. Arvin Garg in a pediatric clinic in Baltimore found that over 2.5 years, 1059 families made use of the program and within 6 months over 50% had enrolled in at least one community-based resource. Similar programs include Health Begins (http://www.healthbegins.org/) in California and Basics for Health, which is beginning at REACH Community Health Centre in Vancouver, British Columbia. [38]

Using an online tool to address broad social needs
A team of health professionals at Boston Children's Hospital, led by Dr. Eric Fleegler, identified that a number of children and adolescents presenting in the clinic had significant social needs. [39, 40] In response, they developed an online tool called *HelpSteps* that assists patients and providers screen for social needs and then direct them to local resources. The tool collects information about gender, age, income, housing status, food security, asthma symptoms, environmental risks and health service need. The tool allows the user to select specific agencies and then print out a

list, including directions and a brief description. [41] A study with 50 users of the tool found that it took on average 25 minutes to use the tool, 90% identified at least one social need and 96% would recommend its use to a friend or peer. The main strengths were that it was private, easy to use, relevant and recommend referrals that were close by. The negative aspects were the length of time it took to use, some challenges with navigating the tool and the lack of capacity at agencies recommended. [42]

Hiring a staff person to focus on income security health promotion
A full-time income security health promoter works with patients at the St. Michael's Hospital Academic Family Health Team to improve the income security of patients. [43] To that end, her activities includes: providing one-to-one case management support and ongoing follow-up to diverse low-income patients and families regarding their income security; conducting outreach to low income patients of the Family Health Teams (FHT), in collaboration with team health providers; developing and implementing targeted information self-help sessions, such as; banking basics, income tax submissions, and social service forms, for the target population; developing and maintaining up-to-date detailed knowledge of financial issues and financial services affecting low-income people, and applying this knowledge in his/her work; assisting individual low-income patients with income security-focused interventions, including access to tax benefits, applications for income security programs such as social assistance and seniors and child benefits, and navigation of disability support programs; and liaising with external organizations, including community social support agencies, legal aid clinics, homeless support agencies, advocacy groups and agencies focused on vulnerable sub-populations to develop referral pathways and supports for patients, with a focus on empowering patients to become change agents. A detailed evaluation of this novel service is underway, led by Dr. Andrew Pinto (Nominated Principle Applicant on this study).

4. Methods

In Part 1, we will conduct an implementation evaluation of the tool at six primary care sites, half in Ontario and half in Manitoba, that serve large numbers of patients with complex health and social needs. We will collect feedback from health providers through an online survey of all users and through focus groups at each site. In Part 2, we will conduct a telephone survey of patients on an ongoing basis at one month after use of the tool. This survey will capture patient perceptions of using the tool as well as their perception of changes in their knowledge of benefits and local resources.

Part 1: Implementation evaluation of an online tool used within primary care to improve the income security

We propose to pilot the implementation of a new online tool to screen for poverty and recommend interventions within primary care organizations. This tool will be developed in close partnership with Prosper Canada. Our project team has been meeting with Prosper Canada staff over the past year. As detailed in our Budget document, we have been successful in jointly securing grants to support this work. This project builds on the software architecture for another tool created by Prosper Canada, "Money Management Tools for Newcomers"

(http://www.newcomerscanprosper.org/). Of note, the online nature of the tool allows for its ongoing refinement and development throughout the early phases detailed below.

First, we will develop a prototype online tool (**Appendix E**) with input from the study team and colleagues, including the Income Security Health Promoter at St. Michael's Hospital. Second, we will conduct two patient engagement sessions, one in Toronto and one in Winnipeg, where we will collect input on the concept, design and content from patients identified through the study team and who attend the clinics where the tool will likely be piloted. This early feedback will be invaluable to guide the design of this tool. Patients will be compensated for their time with a modest honorarium. We will conduct a final set of patient engagement sessions toward the end of the project, to present our findings and obtain feedback on the tool at that point.

Third, the concept of the tool will be introduced at six clinic sites that serve large numbers of patients with complex health needs. In Ontario, these will be identified in collaboration with Health Links. In Manitoba, the tool will be implemented in clinics with a high prevalence of people living in poverty. To introduce the tool, a Continuing Medical Education (CME) session will be conducted at each site by study team members, based on materials developed in partnership with the Ontario College of Family Physicians (OCFP) Committee on Poverty and Health (Co-Applicants on this committee include Dr. Gary Bloch (chair), Dr. Ritika Goel and Dr. Danyaal Raza). These sessions will introduce the evidence behind addressing poverty as a health concern and demonstrate the tool to providers. Informal feedback from providers at this stage will be collected and the tool will be modified. Fourth, the tool will then be piloted at these clinics. The proposed sites provide a variety of settings in which to test the tool.

Ontario
Clinics in Ontario will be approached to participate in this study. Investigators involved with this project (Pinto, Goel, Bloch, Raza) are leaders in this field and have had initial discussions with colleagues and administrators about this intervention:

- **St. Michael's Hospital Academic Family Health Team** serves more than 35,000 patients at six clinics in downtown Toronto. It is one of the largest academic Family Health Teams in the province. While a broad cross-section of the community is served, there is a particular focus on serving marginalized populations. In 2010, over 30% of patients at three of five current clinic sites (St. Jamestown, 410 Sherbourne and 80 Bond) were found to be in the lowest income quintile, and over 50% in the lowest two income quintiles.[14]

Two additional clinic sites in Ontario will be identified. Preliminary discussions have been had with colleagues in Kingston and in Sudbury. Appropriate research ethics approval will be sought at each site as required.

Manitoba
A number of clinics in the Winnipeg region will be approached to participate in this study, several of which have connections to investigators involved with this project (Katz, Singer):

- **ACCESS Clinics** offer health and social services that vary from community to community in order to address the unique needs of the communities they serve. Services include front line health care from physicians or nurse practitioners to assistance with mental health, home care, employment and income assistance programs. ***ACCESS***

Downtown is located in the core downtown are of Winnipeg. It is a new new 42,000 sq. ft. foot centre offering many different services including a primary care clinic, and dental clinic, as well as resources for public health, home care, community mental health, employment and income assistance, and Winnipeg Child and Family Services. ***Access River East*** offers a primary care services as well as individual counselling, hosting health education, workshops and support groups for a wide range of individuals including those who are caregivers, or have specific chronic conditions. ***Access Transcona*** offers a primary care services as well as individual counselling, hosting health education, book clubs, workshops and support groups for a wide range of individuals including those who are caregivers, widowers, or have specific chronic conditions.

- **Aikins Street Community Health Centre** is a primary care clinic with a health care team that includes physicians, a physician assistant, nurses, a counselor, and a dietitian. The services are available to residents within a defined area of Winnipeg more generally associated with lower socioeconomic status.
- **Northern Connection Medical Centre** is a primary care clinic that offers comprehensive primary care to individuals temporarily in Winnipeg from specific northern communities and military families posted in Winnipeg. The clinic is also a teaching site of the Family Medicine residency program with an interdisciplinary care team that includes primary care physicians, family medicine residents (students), nurses, a registered dietitian, a pharmacist and a social worker.

Each site will have some flexibility in how the tool will be implemented into the routine work-flow of patient care, based on input from providers at the site. Health providers will use the tool with every patient seen, at each Annual Physical or Periodic Health Visit, or with specific patient groups (e.g. prenatal patients and well-baby visits). Some sites will also use the tool in an opportunistic way, when patients present with a concern that is linked to social determinants of health. Where possible, there will be a direct link to the tool in the EMR at each site. The tool will be used by any member of the health care team, including physicians, nurses, nurse practitioners, physician assistants, health promoters, dieticians, social workers and others, depending on the clinic site. We will track the professional designation of users of the tool.

Outcome measures

a) Online data collected through use of the tool

We will collect a set of data points on each use of the tool once it is in beta-testing mode. We will not be able to distinguish repeat users. The following will be entered in by the health professional working with the patient to go through the tool:

Socio-demographics	Year of birth, gender identity, race/ethnicity, language preference, whether born in Canada or not (and year of arrival), household income and the number of people supported. The format of these questions will match those recommended by the Toronto Centre LHIN. [44]
Geographic location	Established using Internet Cache Protocol (ICP)
Time	Start time and end time of use
Benefits recommended	Output of tool
Resources recommended	Output of tool

Completion rate	Proportion of users who complete the tool

b) Brief survey of participants at conclusion of tool

At the end of the tool, we will pose a number of questions to users (**Appendix A**), including asking permission to contact them in the future as part of the evaluation.

c) Online survey to providers

After 3 months, online, anonymous surveys (**Appendix B**) will be circulated to all health professionals on their experience of using the tool. We will record contact information for health providers during the introductory sessions held at each site (**Appendix G**). We do not intend to collect identifying information on providers other than their professional designation.

d) Focus groups with providers

We will invite all health professionals at each site via email to participate in a focus group discussion that will explore perspectives, experiences and challenges regarding use of the online tool over the last 3 months. A semi-structured interview guide (**Appendix C**) will be employed for the focus group and discussions will be audio-recorded and transcribed. To identify obstacles to using the tool we will specifically explore cases where a provider felt the tool would have been appropriate, but the tool was not used. Informed consent will be obtained (**Appendix F**).

At St. Michael's Hospital Academic Family Health Team we will conduct 2 focus groups with health care providers. Focus groups will be conducted at 1 month and 3 months following implementation of the online tool. The 1 month follow-up focus group will provide preliminary feedback on use of the tool. We will explore perspectives, experiences and challenges regarding use of the online tool over the last month and how they plan to use the tool over the next 2 months using a semi-structured interview guide (Appendix L)

Part 2: Impact evaluation of an online tool used within primary care to improve the income security

To examine patient experience of the tool and whether their financial situation improved, a brief (10 minute) telephone survey will be conducted in a subset of patients that use the tool. To recruit patients, at the end of the tool we will ask their permission to contact them via telephone or email to follow-up at 1 month. Ideally, this follow-up will be completed via phone. However, if a patient does not have a phone, email may be used to set up an in-person interview, to be conducted at the patient's home clinic site.

The inclusion criteria are as follows:

a) A patient who completed using the tool approximately 1 month ago, either on their own or as part of the screening process with their health care provider
b) Able to provide consent
c) Age is greater than or equal to 18
d) Able to converse in English
e) Able to be reached via telephone or email

Patients will be randomly selected into the telephone sample to a target sample size of 200 patients in each province for a total of 400 patients. Study feasibility is the primary driver for limiting the telephone sample to a subset of patients. Further, we feel that 400 patients will be sufficient to determine the impact of using the tool. Three phone calls will be attempted before a patient will be removed from the telephone survey sample. Consent will be obtained and documented at the beginning of the phone call and calls will not be recorded (**Appendix D)**. Patients will be excluded if they do not provide consent, are unable to converse in English.

Data Collection and Measures

It is estimated that the interview will take 10 minutes. Several questions will be asked; these focus on learning whether the patient found the online tool helpful, what benefits were suggested and whether resources were accessed in order to obtain these benefits. We will also explore whether there was any change in a patient's financial situation (e.g., increased in income or reduction in expenses). The interviewer will enter data into the Telephone Survey Data Form (**Appendix H**) in real-time. Most data will be coded upon entry and free-text will be coded for qualitative analysis.

Analysis Plan

Descriptive statistics will be calculated (counts, percentages, means) and a bivariate analysis (using t-tests and chi-square tests, as appropriate) will be performed to determine associations between patient characteristics and program outcomes (e.g., whether program was helpful, whether financial situation is improved). A regression analysis is also planned to determine patient predictors of program success. The answers to open-ended questions will be coded and categorized to determine whether certain themes characterize the experience of using the tool and the recommended resources.

5. Collaboration

This project occurs in the context of ongoing collaboration between team members based in Ontario and Manitoba, who have a shared interest in a) screening for SDOH in clinical spaces at the individual level, b) addressing SDOH through innovative interventions in primary health care and c) the use of electronic medical records (EMR) to improve health equity. Team members are also part of a network that includes colleagues in British Columbia, Saskatchewan, Quebec and Nova Scotia, who are working to address SDOH.

This study will support cross-jurisdictional scans of work that is occurring to address social determinants in Canada, with a focus on Manitoba and Ontario. We will establish a standard process for screening patients for income security, a key determinant of health. We will design and implement a standard process for identifying community resources to address upstream factors and SDOH. We will examine and report on local factors that influence implementation of this sort of tool. Finally, we will examine the ability to integrate this tool into the EMR (e.g. through having a link present on dashboards or actually bringing content into the EMR).

This study is clearly focused on an "upstream approach to prevention" of health problems through intervening on a key SDOH, income security. If successful, this innovative approach will add a new element to Community-Based Primary Health Care.

Key strengths of this project include the strong alliance between academics, front-line clinicians, policy makers and a charitable organization. This project is focused on the development and evaluation the delivery of integrated services within and across the health sector, and engages other sectors in meeting the needs of patients. We will make use of multiple types of data (quantitative and qualitative) drawn from multiple settings. This project engages patients and providers in the development and evaluation of a unique intervention. Finally, the implementation of the tool will be pragmatic, with the ultimate aim to bring such tools into practice.

6. Ethical concerns

a) Informed consent process
For the data collected at the end of the online tool, consent will be implied by answers provided to the questions. Similarly, when providers complete the online survey, a notice will indicate that consent is implied by completing the survey. Focus group participants will complete an informed consent process at the beginning of the group discussion. Finally, an informed consent checklist will be completed with patients who participate in the telephone survey.

b) Potential risks
Because some time will be used for the tool at the beginning of patient interactions, there is the theoretical risk of taking that time away from a time-limited patient appointment. We will emphasize to participants that participation in the study should neither displace discussion of any medical problems during the appointment, nor should it replace any other income-related interventions that the participant would otherwise make. The screening question may lead to an exposition of a patient problem that the practitioner does not have the resources or expertise to manage. In that case, we will recommend that the patient be referred to the in-house social worker or other relevant professional. All study participants will face a slight inconvenience from participating in the study, due to the time dedicated to the questionnaires and the focus-group session. It is possible that some patients may feel discomfort when asked the screening question, and they may feel shame or fear stigma if they are experiencing income insecurity. We will attempt to lessen this possibility by encouraging participants to normalize the experience for patients, e.g., “I’m asking all of my patients this question over the next month”. Study participants may themselves feel discomfort when asking the question to patients. During the initial training session, we will suggest ways to ease into approaching this topic.

c) Potential benefits
There are many potential benefits to this study. It may sensitize health professionals to the importance of income and health and help physicians discover income as a hidden factor complicating some of their patients’ conditions. This study may help health professionals become familiar with easy ways of screening for poverty and assisting their patients with resources. Importantly, this study may provide patients with valuable resources for improving their income. Finally, this study can support the development of a widely-used tool for improving health through income in other jurisdictions.

d) Privacy and confidentiality: All health care providers who are study participants will be recruited via internal email contact. Participants will be assigned a study number, which will then

be used throughout the study. A master linking log, linking the participant name with study number, will be kept on a password-protected on a secure server. Signed consent forms used in the focus groups will be kept in a locked filing cabinet and will not be linked to the participant's study number. The web-based tool will not track participant names or patient information. All surveys will be anonymized via study number. Responses during the focus-group sessions will be anonymized during or after transcription. The audio recording will be kept in a locked cabinet and destroyed 10 years after completion of the study.

7. Limitations

This study will only examine the implementation and short-term (one month) effects of the income security tool within the defined health clinics at this point. Hence, we will be focusing on early adopters. We will attempt to engage a broad representation of health providers at each site. The information provided may not be suitably tailored to the needs of individuals, which may be a consideration for future research. The time frame of this study restricts the findings to use of the poverty tool and potential use of social resources and services, but does not enable us to examine health effects. Future work will look at the impact of using this tool with patients identified as at risk of developing complex health and social needs, with the hypothesis that addressing income security may reduce the risk for some patients.

8. Study team

Andrew D. Pinto (Nominated Principal Applicant) is a Public Health and Preventive Medicine specialist and family physician at St. Michael's Hospital Academic Family Health Team. He is a Scientist in the Li Ka Shing Knowledge Institute at St. Michael's Hospital. He is an Assistant Professor in the Department of Family and Community Medicine, Faculty of Medicine and the Dalla Lana School of Public Health at the University of Toronto. He has experience in evaluating novel interventions that address SDOH.

Kristin Anderson (Knowledge User) is the Director, Primary Care at Manitoba Health, Healthy Living and Seniors. She has been involved with the poverty tool initiative in Manitoba and a key decision maker for its development and progress.

Adam Fair (Knowledge User) is Director of Programs at Prosper Canada, a national charity dedicated to expanding economic opportunities for Canadians living in poverty through program and policy innovation. He has extensive experience with developing and implementing unique programs to improve financial literacy.

Katelin McDermott (Knowledge User) is a Program Analyst at Manitoba eHealth and works with EMR data quality and optimization for the Primary Care Information Systems office (PCIS). This role supports adoption and effective implementation of clinical information systems, in collaboration with Manitoba Health, Healthy Living and Seniors.

Alan Katz (Principal Applicant) is Professor and Clinician Researcher at the University of Manitoba, Departments of Community Health Sciences and Family Medicine. He is also the Director of the Manitoba Centre for Health Policy; the Research Lead for the Manitoba SPOR PIHCI Network (MSN) and Manitoba Chair in Primary Prevention Research. He has extensive

research expertise and has been a key collaborator with strategic development of the poverty tool initiative in Manitoba.

Gary Bloch (Co-Applicant) is a family physician within the Department of Family and Community Medicine, St. Michael's Hospital, and an Assistant Professor within the Department of Family and Community Medicine, University of Toronto. He is Chair of the Social Determinants of Health Committee within the Department of Family and Community Medicine, St. Michael's Hospital, and the Chair of the Poverty Committee, Ontario College of Family Physicians. He has extensive experience in developing tools to assist primary care providers to address poverty amongst their patients.

Ritika Goel (Co-Applicant) is a family physician at Inner City Family Health Team and Sistering, a women's drop-in centre. She also volunteers and serves as a board member for the Scarborough Community Volunteer Clinic for the Uninsured. She is involved in medical education relating to poverty and health as part of the Ontario College of Family Physicians' Poverty and Health Committee. She will assist with the pilot implementation at Inner City Family Health Team.

Gayle Halas (Co-Applicant) is a Researcher with the University of Manitoba Department of Family Medicine. She has an interest in patient education and interaction and brings a qualitative research perspective to the project and will facilitate the work being done within Manitoba.

John Ihnat (Co-Applicant) is a family medicine resident within the Department of Family and Community Medicine, Faculty of Medicine, University of Toronto. His Residency Academic Project supports this study directly and he will be leading the pilot implementation at Flemingdon Health Centre.

Danyaal Raza (Co-Applicant) is a family physician within the Department of Family and Community Medicine, St. Michael's Hospital, and a Lecturer within the Department of Family and Community Medicine, University of Toronto. He is a member of the the Social Determinants of Health Committee within the Department of Family and Community Medicine, St. Michael's Hospital, and is also a member of the Poverty Committee, Ontario College of Family Physicians. He will assist with the pilot implementation at St. Michael's Hospital.

Alex Singer (Co-Applicant) is a family physician, Assistant Professor in the Department of Family Medicine, University of Manitoba as well as the Director of the Manitoba Primary Care Research Network. Singer was the co-chair of the department of Family Medicine's EMR implementation committee and is a current member of the Winnipeg Regional Health Authority's EMR Clinical Advisory Group. He is a consulting member on the Manitoba Health Primary Care Working Group, with a role in facilitating the linkage between the Poverty tool and EMR within WRHA funded clinics and potentially with other EMR users in Manitoba.

Ross E.G. Upshur (Co-Applicant) is currently the Medical Director, Clinical Research, Bridgepoint Health. He is a Canada Research Chair in Primary Care Research. At the University of Toronto he is a Professor at the Department of Family and Community Medicine and Dalla

Lana School of Public Health, Adjunct Scientist at the Institute of Clinical Evaluative Sciences, an affiliate of the Institute of the History and Philosophy of Science and Technology and a member of the Centre for Environment. He is an Adjunct Associate Professor in the School of Geography and Earth Sciences and Associate Member of the Institute of Environment and Health at McMaster University. He is the former Director of the University of Toronto Joint Centre for Bioethics (2006-2011) and was a staff physician at the Department of Family and Community Medicine, Sunnybrook Health Sciences Centre from 1998-2013. He will

10. Deliverables

Key deliverables include the development of a new online tool in partnership with Prosper Canada with patient and provider input; the findings from implementation evaluation (based on brief patient surveys at the end of the tool, provider online surveys and provider focus groups); and the findings from the short-term impact evaluation (based on telephone surveys with patients). Further, through this process we will develop training materials for health providers, including a brief presentation and manual, on how to use the tool in clinical practice.

11. Knowledge translation and impact

Our findings from both part 1 and part 2 will inform the refinement of the tool. This study will contribute to our understanding of how to assess and intervene on income insecurity, a significant SDOH within clinical settings. Additional deliverables include the refined income security online tool that can be adapted for other jurisdictions in Canada and training materials for health providers on how to use the tool

This project will be an important step toward the goal of being able to address social determinants of health (SDOH) at an individual and family level. If successful, this tool and others will expand the scope of primary health care and provide a concrete way to address issues that health providers have long felt were important. This will clearly be useful to many providers in Ontario, Manitoba and beyond.

Our team envisions this tool as being dynamic, with the potential to be quickly modified to fit different jurisdictions. We will develop and disseminate a plan to assess community resources that can address SDOH, and this process will be helpful to Ontario's organized primary care sector (e.g. Family Health Teams, Community Health Centres), Local Health Integration Networks and local public health units. In Manitoba a significant coalition of healthcare providers, system planners and community organizations has been working to customize the tool to present local Winnipeg resources.

As an online tool, it is easy to develop new modules to address other key SDOH. This could include child literacy, housing or employment. We see this as of particular of value to areas in Ontario with high levels of health inequities where there are multiple, overlapping health and social services, but no clear system for navigation. This project will contribute to future tools to address these issues.

References

1. Commission on the Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. 2008.

2. Public Health Agency of Canada. 2011. What determines health? http://www.phac-aspc.gc.ca/ph-sp/determinants/index-eng.php

3. British Medical Association. Social determinants of health - What doctors can do. 2011.

4. Canadian Medical Association. Physicians and health equity: Opportunities in practice. 2012.

5. Ontario Medical Association. Income and health. 2013;2014(01/06).

6. Rais S, Nazerian A, Ardal S, Chechulin Y, Bains N, Malikov K. High-cost users of Ontario's healthcare services. Healthc Policy 2013 Aug;9(1):44-51.

7. Rosella LC, Fitzpatrick T, Wodchis WP, Calzavara A, Manson H, Goel V. High-cost health care users in Ontario, Canada: demographic, socio-economic, and health status characteristics. BMC Health Serv Res 2014 Oct 31;14:532,014-0532-2.

8. Chechulin Y, Nazerian A, Rais S, Malikov K. Predicting patients with high risk of becoming high-cost healthcare users in Ontario (Canada). Healthc Policy 2014 Feb;9(3):68-79.

9. International Labour Organization. Income Security Index: Information. 2006;2014(01/06).

10. Bartley M, Blane D, Smith G. Introduction: beyond the Black Report. Sociology of Health and Illness 1998;20:563-77.

11. Marmot M, Shipley M, Rose G. Do socioeconomic differences in mortality persist after retirement? 25 year follow up of civil servents from the first Whitehall study. Br Med J 1996;313:1177-80.

12. Marmot M, Wilkinson R. Psychosocial and material pathways in the relation between income and health: a response to Lynch et al. Br Med J 2001;322:1233-6.

13. Ferrie J, Shipley M, Smith G,Davey, Stansfeld S, Marmot M. Change in health inequalities among British civil servants: the Whitehall II Study. J Epidemiol Community Health 2002;56:922-6.

14. Acheson D. The Acheson Report. In: Purdy M, Banks D, editors. The sociology and politics of health: A reader. London: Routledge; 2001. p.111-22.

15. Wilkinson RG, Pickett KE. Income inequality and population health: a review and explanation of the evidence. Soc Sci Med 2006 Apr;62(7):1768-84.

16. Wilkinson RG, Pickett KE. Income inequality and socioeconomic gradients in mortality. Am J Public Health 2008 Apr;98(4):699-704.

17. Che JC, J. Food insecurity in Canadian households. Health Reports 2001;12(4):11-21.

18. Vozoris NT, Tarasuk VS. Household food insufficiency is associated with poorer health. J Nutr 2003;133:120-6.

19. Kennedy G. Food for all. CMAJ 2007;177(12):1473.

20. Hwang S. Homelessness and health. Can Med Assoc J 2005;164(2):229-33.

21. Ricciuto LE, Tarasuk VS. An examination of income-related disparities in the nutritional quality of food selections among Canadian households from 1986-2001. Social Science and Medicine 2007;64:186-98.

22. Canadian Medical Association and others. Health care in Canada: what makes us sick? Ottawa (ON): Canadian Medical Association; 2013. 2013.

23. Buchman S. Screening for poverty in family practice. Can Fam Physician 2012 Jun;58(6):709, 710.

24. Manzano AT, Raphael D. CPHA and the social determinants of health: an analysis of policy documents and statements and recommendations for future action. Can J Public Health 2010 Sep-Oct;101(5):399-404.

25. Abbott S, Hobby L. Welfare benefits advice in primary care: evidence of improvements in health. Public Health 2000 Sep;114(5):324-7.

26. Abbott S. Prescribing welfare benefits advice in primary care: is it a health intervention, and if so, what sort? J Public Health Med 2002 Dec;24(4):307-12.

27. Greasley P. Welfare advice in general practice: a resource for community nurses. Br J Community Nurs 2005 08;10(8):368-72.

28. Greasley P, Small N. Establishing a welfare advice service in family practices: views of advice workers and primary care staff. Fam Pract 2005 Oct;22(5):513-9.

29. Jennings P, Veitch T. Just what the doctor ordered. Health Serv J 1993 Sep 1993;103(5371):30-1.

30. Paris JAG, Player D. Citizens' advice in general practice. Br Med J 1993 Jun 1993;306(6891):1518-20.

31. Adams J, White M, Moffatt S, Howel D, Mackintosh J. A systematic review of the health, social and financial impacts of welfare rights advice delivered in healthcare settings. BMC Public Health 2006 Mar 29;6:81.

32. St. Christopher's House. Financial advocacy and problem solving. 2013;2013(12/4).

33. Shartal S, Cowan L, Khandor E, German B. Failing the homeless: Barriers in the Ontario Disability Support Program for homeless people with disabilities. 2005.

34. Ministry of Community and Social Services. *The Role of Refundable Tax Credits.* . 2013 November 30, 2013;2014(10/22).

35. Ontario College of Family Physicians Poverty & Health Committee. Primary Care Interventions into Poverty. ;2014(3/18/2014).

36. Garg A, Butz AM, Dworkin PH, Lewis RA, Thompson RE, Serwint JR. Improving the management of family psychosocial problems at low-income children's well-child care visits: the WE CARE Project. Pediatrics 2007 Sep;120(3):547-58.

37. Health Leads. Our impact on healthcare. 2013;2013(12/4).

38. Bellett G. Basics for Health jumps in when a prescription is not enough. 2013 October 7, 2013;2014(06/23).

39. Fleegler EW, Lieu TA, Wise PH, Muret-Wagstaff S. Families' health-related social problems and missed referral opportunities. Pediatrics 2007 Jun;119(6):e1332-41.

40. Hassan A, Blood EA, Pikcilingis A, Krull EG, McNickles L, Marmon G, et al. Youths' health-related social problems: concerns often overlooked during the medical visit. J Adolesc Health 2013 Aug;53(2):265-71.

41. HelpSteps.com. HelpSteps - About. 2014;2014(10/22).

42. Wylie SA, Hassan A, Krull EG, Pikcilingis AB, Corliss HL, Woods ER, et al. Assessing and referring adolescents' health-related social problems: qualitative evaluation of a novel web-based approach. J Telemed Telecare 2012 Oct;18(7):392-8.

43. Boudreau E. St. Michael’s looking to close health-wealth gap. 2014 March 21, 2014;2014(September 17, 2014).

44. St. Michael's Hospital. The Tri-Hospital + Toronto Public Health Health Equity Data Collection Research Project Report. 2013;2013(12/2).