

Institute of Population and Public Health
and the
Canadian Population Health Initiative
Population Health Intervention Research
Casebook



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Canadian Institutes of Health Research
160 Elgin Street, 9th Floor
Address Locator: 4809A
Ottawa, Ontario K1A 0W9 Canada
www.cihr-irsc.gc.ca

Canadian Institute for Health Information
495 Richmond Road, Suite 600
Ottawa, Ontario K2A 4H6 Canada
Phone: 613-241-7860
Fax: 613-241-8120
www.cihi.ca

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Canadian Institutes of Health Research - Institute of Population and Public Health (CIHR-IPPH) at ipph-ispp@uottawa.ca or 613-562-5800 ext. 8414.

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Foreword

Population health intervention research examines the impacts of policies, programs and resource distribution approaches on the health of whole populations. It is an emerging field of research that is critical in advancing efforts to reduce health inequities. Population health intervention research builds on several decades of research in important areas such as health promotion, health education and community interventions.

This casebook showcases population health intervention research in Canada. Importantly, the case studies, which were selected through a peer-review process, reveal some of the intriguing, yet often unanswered questions that surround population health intervention research, for example, how did the research question(s) arise; how were partners involved; how did local context shape the interventions; and what challenges were encountered in scaling up and sustaining interventions?

The casebook is a joint initiative of CIHR's IPPH and CIHI's CPHI.

IPPH and CPHI work in partnership to promote, advance and support population and public health research, infrastructure development, capacity building and knowledge exchange to improve the health of individuals, communities and global populations. We also implement proactive, ongoing external relations with population and public health researchers, research funders and research organizations across disciplines and sectors. This partnership approach facilitates the development of a strong pan-Canadian population health research network.

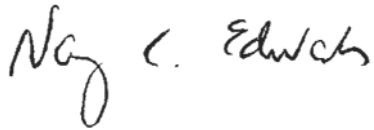
A key activity for our organizations is to showcase the experiences of those researching or working to address population health issues. This casebook describes research related to healthy weights and mental health exploring what works and what does not work about program and policy interventions to address health equity issues at a population level. In addition, the casebook illustrates that population health intervention research remains a nascent field. It raises important questions such as: what does a population health intervention approach mean when we are targeting vulnerable populations; how do we support research that involves complex interventions in non-health sectors or multilevel interventions that cut across the socio-ecological systems; and what kinds of knowledge synthesis approaches are most appropriate for this kind of research? We hope this casebook will help fuel discussions about these important topics among researchers who are applying and developing methods to answer such questions and decision makers who are using evidence to make difficult decisions about how to use scarce resources in ways that more equitably improve health status.

We would like to take this opportunity to acknowledge those individuals who generously contributed their time and expertise to develop this casebook, including IPPH and CPHI staff, the Population Health Intervention Research Casebook Advisory Committee members, and abstract peer reviewers. We would also like to thank the authors, research teams, and communities involved in the eight featured cases. Lastly, we offer thanks to our two commentators, whose insights on population health intervention research raise critical issues that are pertinent to all engaged in this arena of research.

We hope this casebook will become a valuable resource for promoting awareness of population health research evidence in Canada and beyond.

Sincerely,

Nancy Edwards



Scientific Director, Institute of Population and Public Health
Canadian Institutes of Health Research

Jean Harvey



Director, Canadian Population Health Initiative
Canadian Institute for Health Information

Population Health Intervention Research: Introducing the Cases

A population health perspective looks at health in broad terms and addresses questions such as what are the most important factors affecting people's health; why are some people healthier than others; and what can be done to improve the health of all peoples and communities. Population health interventions are intended to shift the risk of entire populations or communities by focusing on community and societal-level factors which influence the distribution of risk and illness in a society (Hawe & Potvin, 2009).

Population health intervention research uses scientific methods to produce knowledge about policy and program interventions that operate within or outside of the health sector¹ and have the potential to impact health at the population level (Hawe & Potvin, 2009). Population health intervention research is a research process that involves knowledge production and is about designing and testing solutions to problems and getting solutions into place (Hawe & Potvin, 2009). It can involve aspects of program evaluation and integrates knowledge translation activities, but also extends and builds on these activities.

There have been several recent investments in population health intervention research in Canada. For example, the Population Health Intervention Research Initiative for Canada (PHIRIC) aims to increase the quantity, quality and use of population health intervention research through a strategic and deliberate alignment of initiatives by key organizations responsible for public health research, policy and practice. Apart from this initiative, examples of national organizations that have made strategic funding investments in population health intervention research include the CIHI, CIHR, the Heart and Stroke Foundation of Canada, and the Public Health Agency of Canada (Di Ruggiero, Rose & Gaudreau, 2009). In addition, the Public Health Agency of Canada has invested in six National Collaborating Centres for Public Health which have a knowledge synthesis, translation and exchange mandate that can promote population health intervention research.

The objectives of this casebook project are listed in the text box.

Casebook Objectives

- Increase awareness and understanding of the value of population health intervention research.
- Highlight different theoretical and methodological approaches to population health intervention research.
- Illustrate lessons learned from both successful and less successful initiatives.
- Demonstrate the impact that population health intervention research can have in informing research, policy, program and practice changes to improve health and health equity and illustrate the 'how' behind this impact.
- Facilitate knowledge translation, including the uptake and adoption of population health intervention research, by a primary audience of program planners and policy decision makers as well as other groups.

¹ For example, school health programs are implemented in the education sector, while occupational health initiatives must engage unions as well as the particular sectors in which the populations are employed.



The examples in this casebook illustrate the range of research projects that identify as population health intervention research and showcase some of the theoretical and methodological approaches as well as tools used in this field. The cases are not prescriptive; they are examples intended to stimulate reflection and discussion. Each case describes a research project that demonstrates impact and lessons learned; illustrates uptake by program planners and policy decision makers; and identifies implications for research, policy and practice. The variability of these cases demonstrates that population health intervention research involves a wide range of research, knowledge translation, and population health approaches. For example, some cases describe targeted strategies focused on vulnerable populations whereas others reflect a universal approach.

The primary audiences for the casebook are program planners and policy decision-makers including those working across health and non-health sectors in community organizations, national/provincial non-government associations, frontline workers, and federal, provincial, territorial, and municipal level governments. Secondary audiences include students, academics, researchers, research funders, and others working both inside and outside of the health sector interested in program planning and policy development to improve the health and well-being of Canadians. We hope that this casebook will become a valuable resource for the diverse population health intervention research communities in Canada and beyond.

Health equity is the overarching theme guiding this casebook. Health equity means that people should not be prevented from attaining their full health potential because of their race, ethnicity, religion, gender, age, social class, socio-economic status, or other circumstance (Dahlgren & Whitehead, 2006). Inequities in health are the result of daily living conditions and the inequitable distribution of money, resources and power (World Health Organization, 2008)—in other words, of circumstances that are modifiable and amenable to change.

Beyond health equity, the cases in this report explore implementation processes. Population health interventions are implemented within a variety of organizational, policy and program delivery systems—not just within the public health sector. The cases describe the development of initiatives designed to increase infrastructure for population health intervention research, community engagement, community-based research, multilevel and intersectoral partnerships and collaboration, scaling-up of promising initiatives and the ethical frameworks underlying population health intervention research.

The original call for case abstracts indicated that we were interested in cases that explored mental health and healthy weights, but that we would consider submissions that addressed other population and public health issues. In this casebook, the term mental health covers mental illness prevention, mental health promotion, individual or community resilience, and healthy individual, family or community coping and development. Healthy weights is also defined broadly to encapsulate prevention of obesity, promotion of wellness, nutrition and physical activity, food security, and prevention of chronic conditions such as diabetes that are related to overweight and obesity. These topics provide a starting point for helping to understand population health intervention research but do not serve as the only points of interest in this field.

Following the open call for cases, and an expert peer-review process, eight cases were selected to showcase examples of population health intervention research in Canada. Based on the submissions, we identified three categories that help to organize the casebook content:

- **Implementation processes supporting population health intervention research**—Some of the cases show how population health intervention research is supported through a variety of implementation processes such as intersectoral collaboration, knowledge synthesis and the development of decision-making tools.
- **Evaluating setting-specific programs**—Population health intervention research can involve systematic evaluation. Some of the cases demonstrate unique methods and strategies for the evaluation of programs working to improve health in school-based settings.
- **Researching multi-component, community-wide interventions**—The remaining cases highlight how researchers are partnering with communities to explore interventions that employ a number of strategies and work across multiple levels to effect community-wide change and improve the health of disadvantaged populations.

This process has highlighted the fact that researchers from very different backgrounds identify as population health intervention researchers. As such, we hope the casebook will showcase varying interpretations of population health intervention research and foster inclusiveness in this field.

At a glance – Implementation processes supporting population health intervention research

Research from the Centre for Research on Inner City Health in Toronto, Ontario focuses on a review of community-based programs designed to meet the needs of homeless adults with concurrent mental health and substance use disorders. The authors took an integrated knowledge translation and realist-informed approach to conduct a community-partnered evidence synthesis. This involved a review of evaluations from community-based programs in addition to key informant interviews to identify promising program strategies and contextual factors that support the strategies' success.

Peel Region is an Ontario suburban area with a number of new immigrants, visible minorities and spoken languages, and some of the lowest active transportation rates in Canada. To explore the health impacts of urban planning and create an assessment tool for new urban development, a collaborative project involving researchers, local public health departments and other municipal partners was conducted in the region of Peel. The project addresses challenges related to social and physical environments, physical activity and active living. It involved reviewing literature to derive built environment elements and measures for an initial tool, holding consultations to identify planning challenges and to refine the tool, reviewing existing standards and bylaws, and conducting studies to validate and assess the feasibility of the tool.

The concluding case in this category describes the creation of a population health intervention research tool, which has been successful in the Eastern Townships of Québec and could be useful for other regions interested in community development as a strategy to tackle healthy weights, mental health or other population health issues. Through a user-friendly presentation of qualitative and quantitative information on community health, well-being, and characteristics, a “Scorecard” tool helps promote community development and fosters intersectoral collaboration. Taking a population health approach, it also contributes to the promotion of health equity and supports the implementation of policies and programs that act on structures in the physical and social environment rather than targeting individual behaviors, habits or skills. The case provides an example of how actors from within and outside the health sector are working together to improve the health and well being of communities.

At a glance – Evaluating setting-specific programs

Healthy Transitions is a school-based mental health promotion intervention research project aimed at youth in Ottawa, Ontario that involves intersectoral collaboration between health and education professionals. The program comprised screening, referral, educational and evaluation components. Trained facilitators provided classroom sessions to encourage students to communicate their thoughts and feelings. Screening protocols were used to identify youth in need of further support or referral. Educational workshops were also available to parents and teachers. Surveys were conducted throughout the program to monitor and evaluate intervention impact.

The *Heart Healthy Kids* (H2K) program involved collaboration between schools, public health departments and community groups; and focused on elementary school children in Halifax, Nova Scotia. This school-based physical activity intervention employs activity challenges, educational sessions, and adult and peer mentoring. The mentoring aspect aimed to improve physical activity by enacting culture change and creating more supportive environments. In evaluating the effectiveness of the intervention, researchers used a mixed methods approach to measure physical activity levels, heart health knowledge and cardiovascular fitness. They also conducted qualitative focus group activities to determine the effectiveness of mentoring and to further explore health outcomes.

At a glance – Researching multi-component, community-wide interventions

The *Healthy Foods North* project describes a multilevel (individual, household, community and environment) intervention that addresses nutrition and lifestyle in Inuit and Inuvialuit communities in Nunavut and the Northwest Territories. Researchers used mixed methods for the formative research phase to understand the needs and preferences of the populations under study. Subsequently, they implemented a population health intervention in partnership with community members, decision makers and private businesses consisting of food store (for example, educational programs to promote stocking of healthy foods) and community-based (for example, cooking classes) activities. To evaluate the impact of the intervention, the research team collected pre- and post-intervention health data from community members using both quantitative and qualitative tools.

The *KidsFirst* project evaluated the effectiveness of an early intervention program that targets vulnerable young children and their families in at-risk Saskatchewan communities. It involved community-based intervention research using an integrated knowledge translation approach to evaluate the effectiveness of *KidsFirst*, an intervention that implements intensive home visiting, reorients health, early learning and childcare service delivery, addresses families' basic needs, integrates families into communities and focuses on community development. The evaluation assessed the project's intervention effects and how those effects were produced by analyzing program data, vital statistics, health care utilization data, and data collected through interviews and focus groups.

Researchers in Northern Ontario implemented school nutrition programs in remote Fort Albany, Kashechewan, and Attawapiskat First Nations communities to promote healthy weights and improved nutrition. They first assessed community context and monitored changes in food and nutrient intake. Subsequently, with the goals of empowerment and sustainability, the research team adopted a community-based approach to implement school nutrition programs that consisted of providing healthy foods at schools, developing healthy school food policies, modifying student curricula, and providing parent and community education programs. Process and impact evaluations of these programs and policies were based on a variety of methods including case documentation, interviews, and focus groups.

General reflections

The cases described in this casebook incorporate a range of innovative approaches including mixed methods designs, community engagement approaches, realist-informed reviews, and geospatial analyses. They vary on a few other parameters, reflecting, for example, small- to large-scale projects, population subgroups to entire populations and communities, and different settings and contexts including schools, rural and remote regions, and whole communities from across Canada. The range of cases presented in this book helps to highlight the continuum of potential uptake or scale-up that may result from population health intervention research projects. Some projects are building to apply similar research in additional settings or communities, while others show evidence of influencing changes to policy-related activities and development.

These cases illustrate some key lessons and important considerations for informing future population health intervention research, practice and policy in Canada.

Key Lessons across Cases

- Engage communities under study, including families, schools, decision makers, governments and the private sector working inside and outside of health, to achieve meaningful interventions, uptake of results and sustainability of interventions over time.
- Build relevant and creative partnerships and relationships over a long period through consistent communication and balancing of priorities between researchers and their community partners.
- Adapt interventions, tools and research methods to meet the needs of different populations, contexts and communities.
- Move beyond individual factors to address broader family, community and social structures that perpetuate health inequities.

There is still a need to raise further awareness and understanding of population health intervention research, including the diverse theories, methods and disciplines that underpin this growing field, and the different contexts in which intervention studies unfold. We hope this collection of cases will provide useful lessons learned about population health intervention research experiences. We have developed a set of overarching questions to guide your reading and fruitful discussion of the eight cases. The challenge remains for researchers, practitioners, decision makers and local communities to continue working together to promote the generation and use of population health intervention evidence in Canada and beyond.

Emma Cohen



Knowledge Translation and Communications Officer, Institute of Population and Public Health
Canadian Institutes of Health Research

Andrew Taylor



Program Lead, Canadian Population Health Initiative
Canadian Institute for Health Information

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Discussion Questions

Given the need to raise further awareness and understanding of population health intervention research, including the diverse theories, methods and disciplines that underpin this growing field, and the different contexts in which intervention studies unfold, please consider these overarching questions to guide your review of the eight cases:

1. To what extent do the interventions described in the cases address underlying structural conditions affecting health and health inequities?
2. What approaches have these researchers used to examine the context(s) for their interventions?
3. How did the teams collaborate with other sectors both within and outside of the health system in their population health interventions and related research?
4. What is the role of program evaluation in population health intervention research?
5. What are some of the factors and challenges that should be considered in determining the potential scale-up of the population health interventions described in these cases?
6. How might you apply the lessons learned and experiences from the featured cases to your own context or work?

Part 1: Implementation Processes Supporting Population Health Intervention Research

The following cases show how population health intervention research is supported through a variety of implementation processes such as intersectoral collaboration, knowledge synthesis and the development of decision-making tools.

Case 1

Valuing context and collaboration in population health intervention research: a realist review of community treatment approaches for homeless adults with concurrent disorders

Case 2

A practical tool for health impact assessment in urban planning

Case 3

Presenting the Québec Eastern Townships Community Scorecard: better knowledge, more timely action



Expanding Evidence Reviews and Knowledge Translation

Case 1 - Valuing context and collaboration in population health intervention research: a realist review of community treatment approaches for homeless adults with concurrent disorders

Kelly Murphy, Dr. Patricia O'Campo, Emily Holton,
Centre for Research on Inner City Health, St. Michael's
Hospital, Toronto, ON

Corresponding author: Kelly Murphy, murphyke@smh.ca

Introduction

Homeless people experience significant, persistent inequities in health and access to health care services compared to the general population. When a homeless person has a concurrent mental health and substance use disorder (concurrent disorder), it puts them at even more disadvantage. The prevalence of concurrent disorders in the homeless population is estimated to be 10–20 percent across North America, although the actual prevalence may be far greater (BC Ministry of Social Development and Economic Security, 2001). In a 2007 community consultation, inner city health service providers described the need for better, more integrated and more responsive services for their homeless clients with concurrent disorders. To help guide policy and program planning, providers said a stronger evidence base was needed to explain what types of community-based interventions best retain and engage clients, and reduce their problems with mental health problems and substance use.

To respond to this request, our interdisciplinary research team carried out a realist-informed, community-partnered evidence synthesis in 2007–2008. We took an integrated knowledge translation approach to promote research uptake and implementation. Community partners were involved in all aspects of the project, including identifying the research question, determining the scope of review, assessing the relevance of literature, and disseminating results. Project partners were the Centre for Research on Inner City Health; Access Alliance Multicultural Health and Community Services; the Ontario Federation of Indian Friendship Centres; Sistering, a Women's Place; Street Health; and South Riverdale Community Health Centre in Toronto.

Our goal was to advise the Ontario Ministry of Health and Long-Term Care and Local Health Integration Networks about appropriate services for homeless people with concurrent disorders. We also wanted to show how grassroots collaborations can contribute to positive health and social service system change, and identify a new method for synthesizing population health intervention research evidence.

This realist review is an example of a comprehensive knowledge translation project focused on gathering, contextualizing, synthesizing, sharing and applying the knowledge produced from population health interventions designed to support homeless adults with concurrent mental health and substance use disorders. The authors build on traditional approaches to evidence review and synthesis by partnering with communities to explore evaluations from community-based programs and to conduct a qualitative investigation into promising program strategies and contextual factors that support their success.



Project description and lessons learned

Because it includes and synthesizes all studies in a field—both positive and negative—a systematic review is more comprehensive than an individual research study, and should offer more reliable evidence to guide decision making. However, standard systematic reviews privilege studies that use randomized controlled trial methodology, and population health interventions are often too complex, adaptive, and dependent on context to standardize for randomized controlled trials. To address these concerns, our approach drew heavily from realist methodology, an approach that accommodates analysis of contextual factors and is aimed to illuminate not only whether a complex intervention works, but also “for whom it works, in what circumstances, in what respects, and how” (Pawson, Greenhalgh, Harvey & Walshe, 2005). Realist review is appropriate for studying many different kinds of interventions and populations. It accommodates many types of evidence (for example, randomized controlled trials, qualitative studies, grey literature, case studies) and assesses the quality of evidence using multiple criteria, including relevance of the research method for the study question (Pawson, Greenhalgh, Harvey & Walshe, 2005).

Altogether, we collected evaluations of 10 different community-based programs for homeless clients with concurrent disorders delivered in a range of community settings (for example, drop-ins, residential facilities). Information related to program contexts, successes and failures was extracted and further supplemented by key informant interviews. From the 10 programs, we identified six promising program strategies that reduce problems with mental health and, to a lesser degree, substance use.

As is often the case with complex population health interventions, no stand-alone strategy was identified. Successful concurrent disorder programs implemented two or more of the following promising strategies in various combinations: client choice in treatment decision making, positive interpersonal relationships between client and provider, assertive community treatment approaches, supportive housing, supports for instrumental needs, and nonrestrictive program approaches. We found that these promising program strategies function, in part, by promoting and supporting autonomy.

Our review also showed that the existing research literature does not address the priority subpopulations identified by our stakeholders, namely: homeless women, newcomers and refugees, and Aboriginal Peoples with concurrent disorders. We did not find any program evaluations with an explicit harm reduction approach, although such approaches matter a great deal to our partners and their clients. This lack of evidence about services for marginalized groups is an important health equity problem that needs to be addressed. In our Community Report (St. Michael’s Hospital Centre for Research on Inner City Health, 2009), agencies described how a lack of research evidence limits innovation and opportunities to learn from innovation.

A key strength of our review is that we applied a health equity lens in our analyses. We did not look at concurrent disorders programs in general; we focused on programs designed for marginalized adults and unpacked what works for complex groups. A related strength is that we were able to integrate providers’ knowledge of “what matters” and researchers’ skills in uncovering ‘what works and how.’ Partners’ involvement throughout the knowledge synthesis process ensured that the project focused on an issue of real importance to decision makers. We co-developed terms of reference early on and found it to be a very helpful tool for outlining roles and responsibilities in advance. Our challenges were primarily related to staffing; it was difficult for community agencies to dedicate a great deal of time or resources to the project. Changes in community agency management also posed a challenge, resulting in shifting priorities and commitment to the project.

Implications for research, policy and practice

We disseminated our realist review results through our collaboratively written, Community Report (St. Michael's Hospital Centre for Research on Inner City Health, 2009) and a scholarly journal article. The latter was very well received by academic reviewers because it demonstrated use of the realist approach for synthesizing evidence on complex urban health interventions (O'Campo, Kirst et al, 2009).

The Community Report is a knowledge translation innovation that other integrated knowledge translation teams may find useful to adopt. The report (a full colour, eight-page booklet) described our team, policy change objectives, our research methodology, and our findings and key messages. In developing the report, partners identified what information would be of greatest interest to program planners and policy makers. Based on these recommendations, we included an appendix with contextual information and an annotated description of each of the 10 concurrent disorder programs that were reviewed. This material was not included in the journal article, and the researchers would not have known to include it without a dialogue with partners. Partners also vetted the Community Report for appropriate language. Our discussions about language illuminated the need not simply to use plain language, but also to emphasize health equity and to use context-appropriate language. For example, partners discouraged use of the label “assertive community treatment” in our report because of controversies associated with such programs in Toronto. Working alone, the researchers on our team would not have had this insight. Based on such advice, we adopted less contentious language. Partners also described and wrote several sections of the report concerning gaps in the research literature (see above).

We launched the Community Report at a widely publicized workshop that included responses from policy stakeholders in the Ontario Ministry of Health and Long-Term Care, the City of Toronto, and the Toronto Central Local Health Integration Network. The report was accepted by the Ministry as input to inform its new Mental Health and Addictions Strategy, and by the Toronto Central Local Health Integration Network to inform new mental health planning for homeless populations. Our findings also contributed to an evidence base to support implementation in Toronto of the Mental Health Commission of Canada's Research Demonstration Project on Homelessness and Mental Health. Following the launch of the report, our research agency team has continued to collaborate on spin-off projects related to concurrent disorder program evaluation.

The report was well received and the project has led to ongoing relationships for a number of reasons. First, the project was timely and responded to a clearly articulated need: revising mental health and addictions policies were high provincial government and regional priorities. Moreover, the report focused on issues of real relevance in our context, and delivered clear descriptions of promising, health-equity focused interventions that could be adopted and adapted to address concurrent disorders.

The information we included in the synthesis was not easy to find. The majority of research studies provided scant explanation of program delivery processes, population characteristics (for example, ethnicity), program philosophies or program contexts (for example, characteristics of the physical, social, cultural, legal and economic environment). Yet this information about context may be what matters most in decision makers' assessments of whether complex population health interventions can be transferred or generalized to new contexts. To respond to this knowledge gap, we supplemented our literature synthesis with interviews with key informants and authors. This information should help stakeholders understand the contexts in which successful programs were implemented and better judge whether those results can be generalized to new contexts.

To provide practical support for healthy public policy decisions, it is crucial that researchers study interventions and populations that matter to stakeholders. It is also necessary, in primary data collection, to provide thicker descriptions of population health interventions (that is, detailed descriptions of programs, populations, environments, factors affecting implementation, factors affecting equitable or inequitable outcomes and a consideration of the reasons for anomalous results). Describing and explaining interventions in detail from the perspectives of providers, planners and clients is a component of realist-informed research designs (Pawson & Tilley, 1997). These data can be collected effectively using qualitative methods, especially in collaboration with program staff, clients and affected communities. Taking these extra steps will enable researchers to generate more comprehensive results, and it will provide research users with information that is essential for planning evidence-informed population health interventions.

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Supporting the Understanding of Population Impacts of Urban Planning

Case 2 - A practical tool for health impact assessment in urban planning

James R. Dunn, McMaster University, Hamilton, ON, and
Centre for Research on Inner City Health, St. Michael's
Hospital, Toronto, ON

Marisa Creatore, Centre for Research on Inner City Health,
St. Michael's Hospital, Toronto, ON

Evan Peterson, Centre for Research on Inner City Health,
St. Michael's Hospital, Toronto, ON

Jonathan Weyman, Centre for Research on Inner City
Health, St. Michael's Hospital, Toronto, ON

Gayle Bursey, Peel Public Health, Regional Municipality of Peel, ON

Jane Loppe, Peel Public Health, Regional Municipality of Peel, ON

Bhavna Sivanand, Peel Public Health, Regional Municipality of Peel, ON

Richard Glazier, Institute for Clinical and Evaluative Sciences and Centre for Research on Inner City Health,
St. Michael's Hospital, Toronto, ON

David Mowat, Peel Public Health, Regional Municipality of Peel, ON

Corresponding author: James Dunn, jim.dunn@mcmaster.ca

This health impact assessment project is an example of comprehensive research to develop, refine, test and validate tools that support incorporating population health principles into urban planning activities. Developed through the collaboration of researchers, local public health departments and municipal partners, the project supported practical tools for action on social and physical environments that influence our ability to engage in physical activity and active living.

Introduction

The Region of Peel is one of Ontario's fastest-growing regions. Each year, Peel adds 20,000 new residents, supported by significant amounts of land development activity on the urban fringe. It is well established that traditional suburban, automobile-oriented development is associated with low levels of physical activity and high rates of obesity among residents. Obesity and inactivity are, in turn, significant risk factors for diabetes and related complications. The impact of the physical environment on health behaviour often precludes or strongly influences individual choice. This is particularly true for disadvantaged populations and requires a population-level intervention. Historically, regulations and standards have been used frequently as population health interventions. Indoor smoking bans are a good example.

The literature on the built environment and health has repeatedly shown that specific attributes of the built environment are associated with poorer health outcomes. More specifically, Canadian research has shown that walkable and activity-friendly neighbourhoods are associated with higher physical activity levels, lower body weights and lower rates of diabetes among residents of Toronto (Glazier & Booth, 2007). In contrast, Peel has among the lowest active transportation rates in Canada (Bray, Vakil & Elliott, 2005).

Conditions related to obesity and inactivity (for example, diabetes and hypertension) are increasing in Peel, prompting Peel Public Health to investigate ways to promote active living in the Region. In 2009, scientists at the Centre for Research on Inner City Health, Peel Public Health and the Region of Peel collaborated to



develop a practical tool (Dunn, Creatore, Peterson, Weyman & Glazier, 2009) that would help the Region's Planning Department assess new land development applications submitted by property developers for their impact on the health-promoting aspects of the built environment, with an emphasis on physical activity.

Project description and lessons learned

To create an assessment tool for new urban development applications, our team engaged in a five-stage process.

First, we conducted an exhaustive search of the published and grey literature to identify built environment measures and standards required for improvements in physical activity levels.

Second, we extracted a series of built environment elements for which there was evidence of a relationship with health and, for each element identified, we attempted to determine specific quantifiable measures, along with targets and ranges for those measures that have been shown to impact health. With these elements and measures, we developed an initial tool, modelled after Leadership in Energy and Environmental Design for Neighbourhood Development (LEED-ND) assessment tools.

Third, based on our initial tool, we conducted a series of informal consultations and formal workshops with Peel Public Health staff, Peel planning staff, planning staff from the municipalities of Mississauga, Caledon and Brampton (which compose the Region of Peel), relevant provincial officials as well as private planning firms. During these consultations and workshops, we sought to identify important substantive and feasibility issues, clarify current practices and gauge the acceptability and feasibility of options for implementing the Tool.

Fourth, we compared the standards suggested by the initial tool and their concordance with existing regional and municipal standards and bylaws.

Finally, we conducted a quantitative validation and feasibility study of the tool using geographic information systems in a small number of Peel communities.

The Tool includes seven elements drawn from the literature, and accompanying measures for each of the elements. The elements are:

- density (for example, dwelling density)
- service proximity (for example, availability of stores, jobs)
- land use mix (for example, diversity of land uses, including retail, commercial, residential)
- street connectivity (for example, density of connections in road network)
- road network and sidewalk characteristics (for example, road width)
- parking (for example, minimum parking standards per residential unit)
- aesthetics and human scale (for example, street setbacks, building height, street width ratios)

This project represented a type of research seldom done in population health: implementation research, with an academic research team and knowledge users. Two key lessons emerged from this unique experience:

- Most published population health research presents data to demonstrate associations, but this is not well suited to defining thresholds and establishing standards.

- The built environment measures used in published research are not always easily adaptable to practical use by institutions that enforce standards.

Implications for research, policy and practice

The outcome of our consultations and policy gap analysis led our team to conclude that application of the Peel Healthy Development Tool to the private development sector would be possible only after further refinement. Our findings suggested that, among other barriers to implementation, developers and builders have limited discretion over many of the built environment elements that contribute to healthy development. Specifically, achieving a number of the targets and ranges the Tool recommended was prevented by transportation engineering standards, municipal bylaws and other standards. Therefore, a series of next steps need to be undertaken before a tool of this nature can be implemented. These include but are not limited to:

- demonstrating that all actions taken towards achieving healthy urban development standards are for the greater good (for example, public safety, economic, environmental) and not just for walkability (an important part of Ontario planning law as the municipality may impose standards that are for the greater good)
- revising municipal and regional planning and transportation standards to conform with Tool recommendations, allowing developers to meet health and policy standards simultaneously
- using a comprehensive, multi-sectoral approach to resolve the inconsistencies between standards across all levels of government, between municipalities and between departments that restrict healthy urban development
- adapting future versions of the Tool to account for the significant differences between smaller infill redevelopment and larger greenfield development
- making rezoning and infill development more viable for developers in order to increase density and mixed land use zones
- using a top-down approach to prioritize overall public health in both transportation and urban planning, avoiding policies that serve private vehicular travel at the expense of the active transport network

To support implementation, our team also developed a report (Dunn, Creatore, Peterson, Weyman & Glazier, 2009) for Peel that identified Peel by-laws that may conflict with the Tool's recommended standards and policy amendments needed to support health-oriented planning.

This project was conducted with close collaboration between the research team, Peel Public Health and a number of partners in other departments in the Region and in Peel's constituent municipalities. Consequently, Peel has begun implementing the recommendations, and the Healthy Development Tool is used as a key reference in decisions to change land-use policy and engineering standards.

Since the report was submitted, the Region of Peel has accomplished a great deal in its efforts to adopt healthy urban development standards. Specifically, the following policy changes have already been achieved:

- amendments to Regional and Municipal Official Plans requiring health impact indicators and assessments as well as encouraging public awareness
- amendments to engineering standards to increase walkability and active transportation, and proposed changes to provincial policy statements

- integration of health background studies at the earliest stage of planning as part of a complete development application

As far as we know, the Region of Peel is the first jurisdiction in North America to create a process for screening land development applications to promote healthy built environments. Although the process to develop a Peel Healthy Development Tool did not proceed exactly as expected, it was still very successful and is expected to make a significant impact on the healthfulness of the Region's built environment for many years to come. Because of the timely and unique nature of this work, and the common health challenges faced today by many communities related to low levels of physical activity and increased rates of obesity, the work is expected to be of great interest to other jurisdictions. Although challenging and somewhat unconventional for academic researchers, implementation research is extremely rewarding when conducted with a decision making organization that has a political mandate to implement policy and is as committed to evidence-based policy as Peel Public Health.

Acknowledgements

Region of Peel

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Creating Tools for Future Population Health Planning

Case 3 - Presenting the Québec Eastern Townships Community Scorecard: better knowledge, more timely action

Ginette Boyer, Planning, Programming and Research Officer, CSSS-IUGS, Sherbrooke, QC

Jean-François Allaire, Research professional, Observatoire estrien du développement des communautés, Sherbrooke, QC

Michel Des Roches, Planning, Programming and Research Officer, Direction de santé publique et de l'évaluation de l'Estrie, Sherbrooke, QC

Victorine Keita, Research Professional, CSSS-IUGS, Sherbrooke, QC

Paul Morin, Professor, Department of Social Services, Université de Sherbrooke, Sherbrooke, QC

Paule Simard, Researcher, Québec National Institute of Public Health, Québec, QC

Corresponding author: Ginette Boyer, gboyer.csss-iugs@ssss.gouv.qc.ca

Introduction

There is no shortage of data available in the various sectors where a population health intervention might be implemented, such as employment, education and public health. However, data are often not integrated in a way that can answer questions about local issues, such as why some communities fare better than others with comparable statistical profiles.

To address these concerns, various actors in Québec from a range of sectors have begun to partner on common approaches to foster the implementation of population health interventions and promote health equity around issues such as mental health, healthy weights, and academic dropout rates. Specifically, the Observatoire estrien du développement des communautés (OEDC), in collaboration with the Eastern Townships Directorate of Public Health, was directly inspired by the work of Boisvert and Milette (2009) to develop the Eastern Townships Community Scorecard (www.oedc.qc.ca).

As implementation of the tool progresses, an increasing number of institutions and community organizations from various municipalities and sectors in Québec have begun using this small-scale data to refine their strategic planning, the design of population health interventions and grant applications.

Project description and lessons learned

The Scorecard's objectives are two-fold:

This project involves collaboration among inter-sectoral partners to create and evaluate a tool to support better population-based planning. The tool presents qualitative and quantitative information on community health, well-being, and characteristics to lay the foundation for understanding community variation, promoting health equity, and supporting policies and programs that act on structures in the physical and social environment. The project provides an example of how actors from within and outside of health are working together to improve the well-being of communities.



1. Follow the evolution of health and wellness indicators in 66 local communities in Québec Eastern Townships (approximately 5,000 people) from one census to the next;
2. Reinforce community development practices as an intervention strategy on social determinants of health

This Scorecard is both a tool to better understand community characteristics and a local intersectoral mobilization initiative. An evaluation of the project is contributing to advancing work on territorial intelligence (Bertacchini, 2010) and community development (Ninacs & Leroux, 2002).

The tool includes quantitative data on local communities and qualitative data from consultations with key citizens and stakeholders on diverse aspects of development for each community. This helped to achieve an accurate global vision of the communities while reporting on only the most relevant indicators for each potential intervention sector.

The use of this tool influences the implementation process for population health interventions. The tool can be used for mapping or to determine relevant quantitative information, and also enables the user to select specific highlights that provide further insight into the numbers. Thus, with the support of the OEDC, development workers can review various indicators and use knowledge from their own communities to identify what may be influencing outcomes. For example, the continuous turnover of administrative and teaching staff in primary schools may be identified in conjunction with high academic dropout rates. Throughout such connections the seeds for implementing population health interventions and promoting health equity are planted.

This project is defined by three complementary characteristics: participatory, intersectoral and adaptable. All decisions on the design and use of the Scorecard are made by the Implementation Committee comprising at least one pair of partners from two different organizations in each regional county municipality territory. Whether identifying criteria for delineating communities, selecting quantitative indicators or developing a communication strategy for decision makers and citizens, members of the Implementation Committee guide, offer suggestions, critique, share successes and challenges and, in general, support the joint development of the project.

Several challenges are involved in the project, particularly surrounding ethical issues. For example, beyond the strictly methodological considerations related to the challenges of producing small-scale data, the project accounted for the potential risk of stigmatization by publishing data on a scale of roughly 5,000 people rather than across municipalities of only a few hundred (potentially identifiable) inhabitants. Another major challenge involves the capacity of organizations to not only bring together communities to engage with this tool, but also support people from these communities who decide to take action. To address the latter challenge, work is underway to develop a regional fund dedicated to community development.

The intersectoral nature of this initiative adds to its reach. Members of the Implementation Committee are frequently connected to other organizations within their home territory. As the Observatoire is an intersectoral hub itself, its leadership sets the tone by attempting to support communities so they might possess a common vision of their situation and rally around one or more intervention initiatives.

Finally, there is no single way to use the Scorecard. Every regional county municipality and community must determine its own context and adapt the tool accordingly. Some integrate information from the Scorecard

into a project to counter the exodus of youth from rural areas while others have used the tool to develop social development policy or a guide for intersectoral action. This potential for tailoring was quickly identified as one of the essential factors in mobilizing both citizens and stakeholders.

Implications for research, policy and practice

A systematic knowledge transfer and communications process aims to enhance the utility of the data and to promote awareness, discussion and uptake by the greatest possible number of people from different sectors (Lemire, Souffez & Laurendeau, 2009). For example, this involved:

- involving local actors in the design and planning of each stage of the project;
- producing facilitation tools;
- developing a local approach to obtain information on community dynamics and facilitating communities to engage in the data;
- publishing of all resources online;
- holding multiple targeted meetings with decision makers, elected representatives, community development workers and citizens;
- discussing the evaluation results with partners

A participatory study (Simard, Allaire, Boyer, Morin & Des Roches, in preparation) documents the process of implementing the project in the first nine local communities (of 66) where action was attempted. Six communities are in rural regional county municipality (one per regional county municipality) and the three others are within the City of Sherbrooke. The partners agreed to follow the evolution of the four action principles that they hoped would permeate the Scorecard's implementation: citizen participation, intersectoral collaboration, empowerment of individuals, organizations and communities, and autonomy of local partners. Over a period of roughly 18 months, preliminary results showed that partners from six of the seven regional county municipality territories gradually adopted and used the Scorecard—primarily as a guide for social policy development and strategic planning for municipalities, government agencies and regional county municipality areas. For the Scorecard to move beyond data generation and become a truly effective tool for community mobilization, key actors need to be involved and the tool needs to be integrated into established interventions and planning practices.

Based on expectations expressed by the partners at the start of this project, the citizen participation component is in need of further work. The mobilization of citizens has been a primary concern in only a single pilot community. However, the partners associated with the Implementation Committee belong to organizations whose mandates frequently span an entire regional county municipality territory, even if they intervene at the local community level (as documented in the Scorecard). This can pose several challenges when one's expressed community of roughly 5,000 people (a grouping of neighbourhoods or towns) does not necessarily correspond to an administrative unit that holds the main levers of action (town or city, but also regional county municipality).

Implementation of the Scorecard will take place in half of the 66 communities of the Eastern Townships in the coming months. The addition of statistical data originating from other databases (for example, school commissions or police departments), a community development training project, and the addition of various tools on the website, are being considered.

Community development has been a longstanding preoccupation for the Eastern Townships. The Community Scorecard's creation has shed light on the limitations of current intersectoral work as well as the desire to develop new collective practices within the various development agencies in every territory (rural agencies, community organizers, economic or cultural development practitioners, etc.).

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Part 2: Evaluating Setting-specific Programs

Population health intervention research can involve systematic evaluation. The following cases demonstrate unique methods and strategies for the evaluation of programs working to improve health in school-based settings.

Case 4

Healthy Transitions: promoting resilience and mental health in young adolescents

Case 5

H2K – The *Heart Healthy Kids* Program



Community-led Evaluation and Intersectoral Partnership

Case 4 - *Healthy Transitions*: promoting resilience and mental health in young adolescents

Corrine Langill, RN, B.ScN. Children's Hospital of Eastern Ontario, Ottawa, ON

Ann Croll, Ph.D, C.Psych, Child and Youth Health Network for Eastern Ontario, Ottawa, ON

Corresponding author: Corrine Langill, clangill@cheo.on.ca

Introduction

Adolescence is a time of intense developmental change as well as social and educational transition. It is also a time when mental health problems can initially surface. However, mental health promotion and mental health care services are often insufficient, and long waits for services are common. Approximately 14 percent of Canadian youth have a diagnosable mental health problem but fewer than one in four youth with a mental health problem get appropriate treatment (Waddell, McEwan, Shepherd, Offord & Hua, 2005). Funding for mental health promotion often does not reflect this need.

There are concerns about inequitable resource allocation, limited services, and the stigma associated with mental illness, all of which present barriers to treatment. We believed that a universal, comprehensive school program could address these inequities by identifying youth in need of services and linking them to appropriate supports, while at the same time promoting positive mental health and reducing the stigma associated with mental illness among all students.

Developing, testing and evaluating such a program helped determine what was effective, desirable and acceptable in a school-based intervention. The program represents a very practical example of what works in mental health promotion. We expand beyond academic arenas by sharing our program and results with broad audiences who are in a position to implement the program, namely: schools, community health centres and youth service providers. Further, a shared-use copyright and easy access to the program and evaluation tools enables other communities to adopt, implement and evaluate this intervention.

Project description and lessons learned

Healthy Transitions was developed in partnership with education and health professionals. It includes a screening and referral component as well as educational components for youth, teachers and parents. Some members of the evaluation team were also responsible for program development and implementation. Pilot testing and program evaluation was completed in the spring of 2006.

The *Healthy Transitions* project involves collaboration between health and education professionals to develop, implement, monitor and evaluate the impact of a comprehensive mental health promotion school-based intervention. Moving beyond academic arenas, mental health professionals, community members, teachers, school board administrators, social workers and public health nurses took joint ownership and responsibility to develop and test a population-based intervention that could be adopted, implemented and evaluated in other communities across Canada.



The youth curriculum included five interactive sessions:

- How thoughts, feelings and actions influence each other
- ‘Rebounding’ from difficult events
- Communication
- Handling stress and feelings
- Getting help when needed

Young adult facilitators were recruited from school social work departments and community health centres and received training to provide classroom sessions to 208 students in groups of 12–15 students at a time. Facilitators used screening protocols to identify and follow-up with youth in need of support or referral.

The youth curriculum is grounded in theories of cognitive behavioural approaches, positive psychology (optimism) and educational theories of social-emotional learning. The program evaluation was designed to assess changes to students’ emotional state, coping and mental health promotion skills. This evaluation also considered the impact on teachers and parents, lessons learned and recommendations for future programming.

Students, parents and teachers completed surveys at various points during the program. In addition, focus groups and interviews with key informants (school principals, facilitators and advisory group members) provided qualitative data on program satisfaction, perceived benefit and recommendations for future programming.

Discussing mental health concepts with young adolescents requires careful attention to ethics. Parental consent was required for students to take part. The consent outlined our guiding principles of confidentiality along with information indicating the types of situations in which information from students would be shared with parents and schools. This was especially significant as we asked specific questions in the screening questionnaire about suicidal thoughts and behaviours. We developed detailed protocols for following up with students whom we were concerned about, ensured all facilitators had received ASIST (Applied Suicide Intervention Skills Training) and established a system of professional back up for facilitators.

Program facilitators identified and referred at-risk students to formal support services, while other students identified through the screening process received more informal monitoring and support. Most youth identified through our screening process had already come to the attention of school staff.

Throughout the program, most youth participants reported high frequencies of feeling happy, and low frequencies of negative feelings. Still, significant numbers of youth felt stressed, worried, angry or sad fairly often. After the program, a substantial proportion of students reported improvements in specific health promoting skills. Youth also reported lower levels of stress and worry, and better knowledge of supportive community resources. Students found the program useful, relevant and enjoyable.

The majority of parents and teachers who attended the workshops reported improved knowledge of healthy adolescent development, community resources, signs that youth may be struggling and how to support positive mental health in teens. Two months after the teacher in-service, most teachers had applied what they had learned.

Lessons learned

The *Healthy Transitions* project yielded two principal lessons. First, meaningful collaboration between cross-sectoral partners ensured everyone was strongly invested in the program's success. Our advisory group members, composed of mental health professionals from the Children's Hospital of Eastern Ontario (CHEO) and the community, teachers, school board administrators, social workers and public health nurses, guided program development and supported its implementation. The advisory group grew out of a working group of the cross-sectoral Child and Youth Health Network for Eastern Ontario, which is supported by CHEO and led by one of the program planners. Members had volunteered to take part in a collaborative working group to develop a mental health promotion program for young adolescents. Because of the positive working relationships that program planners had developed over the years with other community partners, it was not difficult to recruit additional members.

Taking joint ownership and responsibility for the program fostered stronger relationships between partners and facilitated the acceptance of programs into individual schools. Project leaders acknowledged and capitalized on the expertise of group members by having the advisory group develop follow-up protocols, determine program content and provide feedback to all curriculum drafts. All feedback was considered seriously and incorporated into the program.

The second lesson from *Healthy Transitions* was that support and cooperation from school staff are critical. The willingness of school principals to accommodate the program was essential to success. Fortunately, the curriculum sold itself to principals, who were quickly convinced of its potential to meet a number of student needs. They welcomed the positive approach to promoting mental health, and endorsed the learning objectives, teaching strategies and program content.

In general, it was very important to earn the principal's trust through clear, reliable communication, professionalism, flexibility and by following through on commitments. The principal's support was reflected in the dedicated, enthusiastic school staff who organized timetables, assigned rooms, made arrangements for non-participating students, followed up on attendance, obtained consents and fielded questions from parents and teachers.

Implications for research, policy and practice

To facilitate uptake of the program, we developed a Facilitator Resource Guide. The guide included everything needed to implement *Healthy Transitions* in a school community:

- background information on evaluation, consent and how to get started
- follow-up protocols and resources
- an evaluation guide and tools
- sample consent forms
- curriculum for five classroom sessions (including handouts)



We distributed hard copies of the guide (along with a CD) to organizations at national, provincial and local conferences and upon request. We met with officials from the Ontario Ministries of Education and Children and Youth to outline the program (the entire program is online at www.child-youth-health.net). As a result,

several local schools have piloted the program independently. We have received requests for the curriculum from schools, public health units, community health centres and youth-serving organizations across Canada.

Healthy Transitions was designed for use in any school and could easily be adapted for youth who are in their mid to late teens, attending a youth program or experiencing a mental health problem. The program is suitable for broad implementation across school boards or provincial ministries of education. The Facilitator Resource Guide highlights where modifications may be required to meet legislative or policy requirements (for example, provincial reporting requirements for children in need of protection). Local jurisdictions would also need to highlight local mental health resources for youth.

We suspect that the screening and referral component is a barrier to uptake. The process requires a thorough review of all completed screening questionnaires, application of follow-up criteria, follow-up with individual students, assessment of immediate risk, and appropriate referral. The time, skill and commitment needed to safely screen, assess and refer students may discourage some considering introducing *Healthy Transitions*. The facilitator-led model was recommended by youth in our focus groups but this also may be challenging for schools to organize. Eliminating the screening component or having teachers help deliver the curriculum might make things easier.

The scope of this project was limited to program development and initial evaluation. While our program evaluation was promising, it lacked the rigour that provincial ministries and school boards look for when allocating scarce resources. Researchers interested in this area might compare youth who receive the program with those who do not, assess the long-term impact of the program, and determine if the program could be delivered effectively by classroom teachers with larger groups of students (for example, an entire class). We would also like to know if the screening/referral component is essential to the program's success. Schools currently devote considerable resources to anti-bullying programming; it would be interesting to compare the overall impact of existing anti-bullying programs with a more generic mental health promotion program such as *Healthy Transitions*.

The *Healthy Transitions* project represents a first step toward policy changes needed for comprehensive mental health promotion in schools. It established an effective partnership model, highlighted processes critical for successful program delivery and demonstrated positive impact on students' emotional states and coping skills. It provided essential knowledge not only about the elements a program should include, but also about how to implement a mental health promotion program in schools. More rigorous demonstrations of program impact are needed to effect policy changes related to school curriculum, public health activities and resource allocation.

It is a challenge for service-providing health professionals to engage in population health intervention research. Most have workloads that do not allow for research beyond the realm of program evaluation. These professionals tend, therefore, to limit research activities to developing or testing practical solutions that address a specific problem, rather than planning publishable research projects from the outset. This leaves potentially valuable interventions in a "promising practices" kind of purgatory, where decision makers are not likely to implement them broadly without higher-quality evidence. The collaboration and support of experienced principal investigators for community-identified projects would be most helpful. Such leadership and guidance would be very welcome to community professionals for planning, conducting and securing appropriate funding for high-quality population health intervention research.

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Ottawa Carleton Catholic School Board
Western Ottawa Community Resource Centre
Centre for Addiction and Mental Health
Ottawa Public Health
Canadian Mental Health Association

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Scaling Up a School-based Pilot

Case 5 - H2K – The *Heart Healthy Kids* Program

Rebecca Spencer, MA Health Promotion Student,
Dalhousie University, Maritime Heart Center, Halifax, NS

Jenna Bower, OT Reg (NS), Maritime Heart Center,
Halifax, NS

Jennifer Hoyt, Halifax Infirmary, QE II Health Sciences
Centre, Halifax, NS

Jennifer Miller, Halifax Infirmary, QE II Health Sciences
Centre, Halifax, NS

Gillian Yates, Halifax Infirmary, QE II Health Sciences
Centre, Halifax, NS

Sara Kirk, School of Health Administration, Dalhousie
University, Halifax, NS

Camille Hancock Friesen, Department of Surgery, Dalhousie University; Division of Cardiac Surgery, IWK
Health Centre; Halifax Infirmary, QE II Health Sciences Centre, Halifax, NS

Corresponding author: Becky Spencer, becky.spencer@dal.ca

Introduction

Only 12 percent of Canadian children are sufficiently active (Active Healthy Kids Canada, 2009) and the prevalence of childhood obesity and type 2 diabetes is growing. To respond to these health issues, the *Heart Healthy Kids* (H2K) research program was designed as an intensive physical activity intervention involving the assessment of children's physical activity levels, heart health knowledge and cardiovascular fitness. Our long-term goal is to improve levels of childhood physical activity sufficiently to enact a culture change that, in turn, will decrease sedentary behavior and, ultimately, decrease the prevalence of chronic disease.

The project has adopted a population health approach to target youth as a vulnerable group needing intervention. To target the group as a whole, the H2K program is school-based, allowing it to reach all children in the involved schools, regardless of socioeconomic status or other factors that typically influence participation in research programs (Sonneville, LaPelle, Taveras, Gillman & Prosser, 2009). While H2K is a research project, some program components are offered to all students (whether they have consent for participation or not) allowing everyone equal opportunity to participate. As the program expands its enrolment from 150 to, potentially, 1,200 students, additional components will be made available to a larger group of students.

To increase the relevance of the research project and more generally promote awareness of the applicability of a population health approach, the H2K program has integrated various knowledge translation activities. H2K is helping to support population health research by focusing on vulnerable populations and using an ecological approach with a focus on the social environment.

The *Heart Healthy Kids* (H2K) program brings together school, public health and community groups to evaluate the effectiveness of a school-based pilot program. Using a mixed methods approach, the evaluation team explored the value in supporting behavioural change through individual education and the creation of more supportive environments and social structures. The pilot is being scaled up for implementation in more contexts, laying the foundation for future population health intervention research.



Project description and lessons learned

The H2K program was developed by a team of health professionals to improve levels of childhood physical activity. The program began in 2006 as a one-school, three-year pilot with grade 4, 5 and 6 students, and is based on social cognitive and ecological theory. These grades were chosen to address a gap in local research, which has shown that grade 3 students attain adequate physical activity but grade 7 students do not. In this school, an activity challenge was coupled with biannual educational sessions given by health professionals. The activity challenge was for teams of students to wear pedometers daily, for the entire school year and compete for virtual distance traveled. This pilot was conducted with an adult mentor present four hours per week in Year 1 and without an adult mentor in Year 2. A second pilot was conducted in the 2009–2010 school year, employing peer mentoring instead of adult mentoring. Peer mentors were trained at a one-day, in-school workshop to develop leadership skills and learn about H2K. Peer mentors then had the opportunity to mentor teams of students to increase their physical activity. Employing peer mentors helps researchers understand the previously unstudied role of peer mentoring in improving physical activity. Peer mentoring also addresses the issue of sustainability in attempts to effect cultural change.

Both pilots saw increases in participants' average steps per school day in the presence of mentoring as well as short- and long-term knowledge gains with respect to heart health. In addition, measured cardiovascular fitness improved. Qualitative data derived from focus groups showed positive trends in the theme areas of entertainment, health and motivation. These themes indicated, first, that the participants enjoyed taking part in the program, that it was fun, and that they wished to continue taking part (entertainment). Second, the H2K program supported the adoption of healthy habits and recognition of the importance of physical activity and healthy eating with regard to disease prevention (health). Finally, the qualitative data indicated that motivation through peer mentoring in the H2K program was important in strengthening social relationships at school as well as engaging in new or extra physical activity (motivation).

One of the biggest lessons we have learned is the importance of school-based intervention programs; previous research has shown that children who are least active overall get the majority of their activity during the school day (Cox, Schofield, Greasley & Kolt, 2006). Buy-in and support from teachers and school staff is critical to the success of the program and we would recommend that future school-based interventions adapt to suit the specific needs of individual schools. We have also learned of the challenges associated with collecting self-reported data from children, and of program fatigue. We have had to come up with new and innovative methods to keep interest in the program alive, such as awarding not only high-performing teams, but also teams who log the most frequently or demonstrate the most spirit. Finally, a major challenge we consistently face is in finding enough resources for the program. Because H2K is a program with a research component, we are often not eligible for resources designated strictly for either interventions or research. We have streamlined the program for efficiency, including using peer mentors, which will enhance sustainability by avoiding the resource intensiveness of hiring a registered nurse as an adult mentor.

Additionally, we have learned the importance and value of collaboration. We have a multi-disciplinary volunteer steering committee (including a cardiac surgeon, registered nurses, a dietitian, kinesiologists and an occupational therapist); we also have informal partnerships with local elementary schools, their staff and students, and formal partnerships with the Halifax Regional School Board, the Heart and Stroke Foundation of Nova Scotia, and Public Health (Capital District Health Authority). The upcoming expansion of the program will allow us to develop partnerships with medical students, who will deliver the educational

sessions, and approximately 50 volunteers (community members and university students in professional health programs), who will assist with program deployment.

Implications for research, policy and practice

Our pilot work has shown that mentoring is associated with trends toward increased physical activity levels, educational sessions are associated with short- and long-term knowledge gains, students who are enrolled in organized sport are more active overall and the vast majority of students do not meet minimum activity recommendations. While the project is too preliminary to have influenced true policy change, continued expansion of the program is evidence of uptake. As of September 2010, the H2K program was expanded to 10 schools including five experimental and five control schools, which allows for a true control arm and more robust quasi-experimental design. The research objectives of the expansion are to evaluate the role and effectiveness of peer mentoring in improving levels of physical activity, with secondary endpoints of heart health knowledge, cardiovascular fitness and anthropomorphic data. A nutritional questionnaire and parent surveys have been added to further examine the complex relationship between children and their environment that negatively impact physical activity and enhance rates of childhood obesity, and to ensure more thorough results that can be generalized.

Knowledge translation is important as we expand the scope and range of the H2K program and we are dedicated to seeking opportunities to present the research as well as publish results. Our pilot data suggest that the H2K program, including peer mentoring, shows promise for future population health impact. Preparations to scale up the intervention research program have begun with receipt of institutional ethics and school board approval, as well as enrolment of 10 new elementary schools. A partnership forum occurred in September 2010 to engage further private and public interest and funding.

The research team intends to use the results of the scaled up research as evidence for policy change in relation to childhood physical activity by advocating and working with local government. Currently, in Nova Scotia, elementary students typically receive only two 30-minute periods of physical education weekly; it is recommended that children receive 90 minutes of activity daily, leaving individuals and families responsible for ensuring children receive the majority of their necessary activity (Public Health Agency of Canada and Canadian Society for Exercise Physiology, 2009). We hope that the H2K program provides enough evidence for school-based physical activity that a policy change will ensure all students have equal opportunity for a guaranteed minimum of daily physical activity.

Beyond the 10-school expansion, the H2K program offers many opportunities for future research. The research team anticipates a longitudinal follow-up of research participants to further explore the relationship between the H2K program and activity patterns, as well as the relationship with cardiovascular disease. Other research may include closer examination of mentor type, as well as frequency and duration, to better understand what can positively influence childhood physical activity levels. Beyond the research component of the H2K program, we also intend to expand the program to include more local schools from around the province of Nova Scotia, the other Atlantic Provinces and beyond.

In conclusion, the research team strongly believes that there is evidence for the use of mentoring in adopting healthy habits in childhood, and that a population health approach is necessary in order to widely improve the current level of childhood physical activity. We believe that the expansion of the H2K program will provide the evidence necessary to change policy and provide all children with equitable access to

physical activity. We recommend that other researchers in this area adopt a population health approach and focus on the social environment to produce durable change.

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Part 3: Researching Multi-component, Community-wide Interventions

The following cases highlight how researchers are partnering with communities to explore interventions that employ a number of strategies and work across multiple levels to effect community-wide change and improve the health of disadvantaged populations.

Case 6

The *Healthy Foods North* nutrition and lifestyle intervention program: a community- and evidence-based intervention trial among Inuit and Inuvialuit in Arctic Canada

Case 7

Early childhood intervention in the community... makes sense, but does it really work? Findings from our three-year collaborative study

Case 8

School nutrition programs in remote First Nations communities of the western James Bay region: impact, challenges and opportunities



John Harris of Grise Fiord, Nunavut

Working with Communities and the Private Sector in the Canadian Arctic

Case 6 - The *Healthy Foods North* nutrition and lifestyle intervention program: a community- and evidence-based intervention program among Inuit and Inuvialuit communities in Arctic Canada

Sangita Sharma, Endowed Chair in Aboriginal Health and Professor of Aboriginal and Global Health Research, Department of Medicine, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, AB

Erin Mead, PhD student, Department of Health, Behavior, and Society, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD

Joel Gittelsohn, Professor, Center for Human Nutrition, Department of International Health, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD

Lindsay Beck, Community Health Science MSc student, University of Northern British Columbia, Prince George, BC

Cindy Roache, Department of Health and Social Services, Government of Nunavut (at the time of research)

Corresponding author: Sangita Sharma, gita.sharma@ualberta.ca

Introduction

Healthy Foods North (HFN) is a novel, multilevel health intervention program to address the growing public health and societal burden caused by the nutrition and lifestyle transition among Aboriginal Arctic populations in Canada (Sharma, 2010). The aims of the HFN nutrition and lifestyle intervention program are to reduce the risk of obesity and chronic disease, improve dietary adequacy and increase physical activity. Achieving good nutritional status and moderate to high levels of physical activity is important for the prevention of chronic diseases as well as infectious diseases that an immune system compromised by poor nutrition cannot easily prevent or cure. Previous interventions targeting Aboriginal Arctic populations often do not follow a population health intervention approach and largely consist of mass media programs that have been adapted from programs in southern Canada.

This innovative program was developed to address complex public health problems and their underlying factors. Through primary prevention, HFN aimed to reduce the disproportionately higher burden of many diseases among Inuit and Inuvialuit (Sharma, 2010), thus contributing to greater health equity. Support from the community for the program was key to ensuring both the development and implementation of the program was culturally appropriate, effective and sustainable. To obtain support, partnerships were created with community stakeholders, community members participated in the formative phase to develop the intervention, and community members were trained to implement research and intervention activities

The *Healthy Foods North* project highlights a multilevel (individual, household, community and environment) intervention research project in Inuit and Inuvialuit communities in Nunavut and the Northwest Territories. Using a mixed-method approach to evaluate the impact of the intervention, this project demonstrates the value of partnering with community members, decision makers and private businesses and the value in implementing food store-based and community-based activities to support individual nutritional and lifestyle change.



(Gittelsohn et al., 2010). As a result, Aboriginal peoples, organizations and communities may develop a more positive view of evidence-based research that contributes to improving health.

Project description and lessons learned

Healthy Foods North addresses six critical areas for health promotion in Arctic communities:

1. Creating an evidence- and community-based, culturally appropriate, rigorously evaluated and sustainable intervention
2. Providing up-to-date dietary, anthropometric and physical activity data, for example, evidence on which to base a program
3. Creating population-specific methodologies for monitoring changes in diet
4. Building local capacity for health promotion intervention development and evaluation with the communities
5. Creating a bridge for partnership between the private sector (food retailers, airlines, shipping companies), communities, government and academia
6. Sharing results at the community level in culturally appropriate formats (such as posters and presentations) and having community champions present results locally and nationally

HFN's formative research phase combined quantitative and qualitative methods to determine needs and preferences of the populations and to provide a context for understanding food and physical activity decision making (Sharma et al., 2009, Sharma et al., 2010, Gittelsohn et al., 2010). The intervention, its messages and materials were based on social cognitive theory and social ecology frameworks for behaviour change, collaborations between partners, 24-hour dietary recalls with randomly selected Inuit/Inuvialuit adults to characterize the diet, and in-depth interviews. We also held two-day participatory community workshops in the four Nunavut and Northwest Territories communities that would become the intervention communities (Gittelsohn et al., 2010). Selected via purposive sampling, workshop participants were community stakeholders, including elders, community leaders, community health program representatives, store managers and other community members. They identified the problem foods in their communities, healthier and appropriate alternatives, key messages and themes for the intervention, and avenues to deliver the messages.

Working at environmental, community, household and individual levels, HFN has two main components: food store-based activities and community-based activities (Sharma, Gittelsohn, Rosol & Beck, 2010). Store-based activities include increased stocking of healthy foods, interactive educational sessions (for example, food tasting), shelf labels, displays and posters. The messages conveyed in the sessions are reinforced through giveaways and handouts. Community-based activities include cooking classes, pedometer challenges, walking clubs, community feasts, radio stories and partnering with other local health programs. Local, trained community staff conducted all activities. The pilot intervention was implemented over 12 months from 2008–2009 in two Inuit communities in Nunavut and two Inuvialuit communities in the Northwest Territories.

Dietary, behavioural, physical activity and anthropometric data were collected from Inuit and Inuvialuit respondents pre- and post-intervention in the four intervention and two delayed-intervention communities to evaluate impact. Preliminary significant findings of the impact evaluation include decreased intake of

energy and carbohydrate, increased density of select nutrient intake, and a 2.6 percent decrease in average body mass index after controlling for age, gender, socioeconomic status and intervention group assignment. These changes may be attributable to HFN's promotion to replace foods and beverages low in nutrients and high in fats and sugars with traditional foods, fruits, vegetables, and low-sugar beverages as well as facilitating an increase in physical activity. For example, preliminary significant findings from the impact evaluation indicate an increase in traditional meat consumption and decrease in high-fat, store-bought meat consumption. Self-efficacy and intentions to engage in healthier dietary behaviours also increased. From the formative phase through intervention evaluation, more than 700 people in the communities completed questionnaires or interviews (Sharma, 2010, Sharma et al., 2009, Sharma, Gittelsohn et al., 2010) and approximately 60 worked on the project.

One of the biggest challenges to implementing any research or intervention in the Arctic is the remoteness of the locations, which poses considerable logistical and personnel obstacles. In addition, many communities do not have health programs that foster partnerships across organizations, particularly with the private sector. In the case of HFN, initial researcher, community and government collaborations started to build essential partnerships, infrastructure and capacity for a multi-component, multilevel program four years before actual intervention implementation. A partnership with the private sector is a key factor for a program such as this, and the food retailers, as well as other organizations and businesses (for example, research institutes, airlines) were supportive and invested in the program. Our experiences highlight the need for comprehensive and consistent communication between all program stakeholders and partners throughout all phases of development, implementation and evaluation. Engaging stakeholders along the way helped to ensure expectations were being met and key lessons learned were being disseminated.

Implications for research, policy and practice

HFN acted as a bridge between directed research and evidence-based decision making. All partners of HFN played a vital role in its success: communities and Aboriginal organizations provide essential knowledge of societal values in relation to health and championing of the approach; academic partners provide essential expertise in research methods and intervention design; governments facilitate overall coordination of the project, particularly in engaging relevant partners from a policy perspective (that is, community health programmers); and the private sector, particularly food retailers, contribute essential expertise in the areas of Northern food transportation systems, in-store marketing and promotions, and product supply decision making.

At every stage of the program, results were shared with the partners and stakeholders, providing them with the opportunity to use data to improve health services and population health programming. For example, the preliminary evaluation results were presented to the federal and territorial governments. Communities were given the results on traditional food consumption and the important contributions these foods make to ensuring people receive sufficient nutrients, which was one of the communities' major priorities.

In addition, retailer, community member, government staff and academic partners presented HFN results at an international congress. Furthermore, community members and government partners had input into the research and intervention. For example, traditional values identified by the workshop participants were incorporated as family motifs and also formed the basis of entire phases in the intervention (that is, a country foods phase). The intervention staff were community members themselves and helped in the ongoing refinement of intervention activities. Extensively sharing results and information, as well as

providing support among all project partners, is essential in celebrating success and keeping up the momentum. Results are currently being provided to the communities.

HFN has been incorporated into public health policy at the territorial and community levels, including the *Nunavut Nutritional Framework For Action* and *Developing Healthy Communities: A Public Health Strategy for Nunavut* and the *NWT Foundation for Change Action Plan 2009–2012*, with much more to be done with such positive results. By bringing together such diverse information and partners, HFN has the potential to act as a springboard to innovative health system decision making.

The HFN approach of involving all stakeholders in an open and innovative process can be generalized to a number of health systems and community settings, particularly in Aboriginal and remote and isolated communities. HFN started originally in Nunavut, and the Northwest Territories component was added with relative ease, highlighting the ability to utilize the framework and approach in new settings. The communications and community level activities were designed with extensive community input, and communities have subsequently asked to use the communications tools and overall program design to address other public health issues such as smoking. Valuable results, such as typical portion sizes for a variety of foods, will be available for clinicians to use for individual treatment, counseling and population health programming design. From an ethical perspective, HFN considered the broad sustainability of the program and the appropriateness, such as using foods that were readily available, easy to obtain and affordable.

Community stakeholders may have different priorities than researchers, which must be incorporated into program development and implementation. Community members serving as program staff and peer educators were a key element of success, though high turnover was a challenge indicating, perhaps, a need for more job flexibility. Members of the community played a significant role in moving research findings into practical and culturally relevant program development and implementation. By training community members to conduct research and intervention activities, academia shared knowledge with communities and other stakeholders, ultimately building capacity and hopefully strengthening the overall performance of the health care system from community, regional and territorial perspectives.

Given the strong focus on community involvement and the value attributed to Inuit and Inuvialuit culture and norms throughout the program's development, the evidence and lessons learned are potentially applicable to other Inuvialuit and Inuit communities. Moreover, the HFN program and research design can complement programs that tailor to specific community contexts, especially in Aboriginal communities. HFN may become a model of sustainable health promotion programming and population health intervention research that makes nutrition and lifestyle education culturally appropriate while improving Aboriginal health. Future population health intervention research initiatives have the potential not only to improve health at the local community level, but also to generate policy changes for broader population health.

For more information on the pre-intervention results, please refer to the following publication:
<http://onlinelibrary.wiley.com/doi/10.1111/jhn.20s10.23.issue-s1/issuetoc>

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Partnering Across Research, Policy and Practice

Case 7 - Early childhood intervention in the community... makes sense, but does it really work? Findings from our three-year collaborative study

Fleur Macqueen Smith, MA, University of Saskatchewan, Saskatoon, SK

Nazeem Muhajarine, PhD, University of Saskatchewan, Saskatoon, SK

Hongxia Shan, PhD, University of Saskatchewan, Saskatoon, SK

Darren Nickel, PhD, University of Saskatchewan, Saskatoon, SK
Healthy Children Research Team, Saskatchewan Population Health and Evaluation Research Unit,
University of Saskatchewan, Saskatoon, SK, on behalf of the *KidsFirst* Evaluation Research Team*

Corresponding author: Fleur Macqueen Smith, fleur.macqueensmith@usask.ca

Introduction

KidsFirst is a provincial government population health intervention aimed at vulnerable children and their families that is administered locally in nine at-risk Saskatchewan communities. It uses intensive home visiting to build capacity in families, promote healthy child development and facilitate goal achievement for parents (such as returning to school or finding a job). *KidsFirst* also connects families with mental health and addiction services as well as early learning and childcare programs.

Our research team recently completed a three-year evaluation to determine the effectiveness of *KidsFirst*, using an integrated knowledge translation approach in which decision makers were engaged throughout the research process (www.kidskan.ca - select “*KidsFirst*” from the Projects menu on the left). This project is an example of community-based intervention research; it brought together researchers (from community health and epidemiology, social work, economics, political science and nursing), program managers from *KidsFirst* and government policy makers (from education, health, social services and First Nations and Métis relations) to ensure that the knowledge generated from evaluation was translated into program improvements.

KidsFirst addresses health equity by targeting families most in need to improve children’s well being and family functioning. It also focuses and intervenes on upstream factors that determine child health and development, and strengthens the community as a whole. Our evaluation is of practical value both to the program and other early childhood intervention activities because it:

1. focuses on child development in vulnerable families, a topic that has attracted worldwide attention (Keating & Hertzman, 1999)
2. integrates findings from the application of multiple methods (Muhajarine et al., 2010)

The *KidsFirst* evaluation project showcases a partnership between researchers, program planners and government representatives developed to evaluate the effectiveness of an intervention for at-risk children. It demonstrates a mixed method and partnership approach to program evaluation and explores the value in an intervention that acts at individual, family and community levels to support changes in at-risk communities.



3. is driven by a clear framework, developed in collaboration with program staff (Muhajarine et al., 2010)

Project description and lessons learned

This project was initiated when the director of the government unit responsible for *KidsFirst* approached the principal investigator, Dr. Nazeem Muhajarine, as a result of his previous work in establishing program goals and objectives and his well-respected body of work in children's health research and knowledge translation. Subsequently, Dr. Muhajarine was able to secure external funding through a peer-reviewed process and assemble a team of researchers and decision makers to conduct the evaluation.

Between 2007 and 2010, the team used mixed methods to assess the program's effectiveness in helping participating families and communities make positive changes. The team started by constructing an evaluation framework collaboratively with program staff, and developing a background paper. It then conducted quantitative and qualitative studies to assess the short-term effects of the program and how these effects were produced. While the team developed the research questions in collaboration with program managers, researchers who had no control over program operation or design completed the methods and data interpretation. As well as receiving ethical approval from the University of Saskatchewan, the study also received approval from the health regions at each of the nine program sites.

For the quantitative study, the team analyzed routinely collected program data to assess family functioning and child health and development. It also employed a control group and analyzed vital statistics and health care utilization data representing adverse birth and health care outcomes. For the qualitative study, the team conducted 84 interviews and 27 focus groups with 242 adult program clients, program staff and government officials to reveal practices and processes contributing to positive child health outcomes.

Findings suggest that *KidsFirst* can help ensure that children in very vulnerable circumstances are nurtured by healthy, well-functioning families. Key activities included working with parents to enhance their knowledge and assertiveness; addressing families' basic needs such as helping them access food, transportation and services; and integrating families into their communities by connecting them to services, organizing social events and helping clients re-enter school or the job market. Program managers found that they served families better when they forged collaborative relationships with other organizations in their communities that worked with the same clients. Participants in the qualitative study reported that many parents have received mental health and addiction services because of *KidsFirst*.

Despite these successes, the team found that the program struggles to find sufficient human resources and staff capacity to serve the complex needs of some families. Typically, this problem arises with families that experience cyclical crises such as mental health and addiction issues, that cope with fetal alcohol spectrum disorder (their own and that of their children), and that are transient and homeless.

The geographical distances separating partners and the differing views that partners had of the research meant that a concerted effort was required for the academic researchers to maintain contact, constant diligence was needed to avoid misunderstanding, and good faith and discussion were essential to work through the issues that arose. It was also challenging to evaluate a program that did not have the infrastructure for systematic and continuous evaluation. Although considerable program data are continuously collected, there were issues with quality, reliability, completeness and relevance, leading the

team to recommend a thorough review of existing data-collection procedures. The team also recommended that data would be more meaningful with the addition of audit and quality-control procedures (Muhajarine, Glacken, Cammer & Green, 2007).

Implications for research, policy and practice

Our experience demonstrates that community-based intervention research can be a unifying process, bringing together researchers, program managers and government policy makers. Effective population health intervention research is founded on the principle of collaboration among those who design and implement the programs, as such individuals can put the knowledge generated during an evaluation into policy and practice to improve the program. Ideal partners for this type of research are those who are committed to fully participating in the early phases of the study and are then committed to acting on the independent evidence produced.

Following a day-long meeting to jointly develop a program logic model and evaluation framework, researchers met every few months with program managers and staff from the government unit responsible for *KidsFirst*. In between these meetings, the principal investigator and research staff interacted regularly with these same partners by phone and email. Researchers also interacted in the early stages of the project with an advisory committee of government officials representing the four ministries involved in *KidsFirst*. A follow-up advisory committee meeting to discuss results and recommendations emerging from the research has yet to be held.

Throughout the evaluation, the team shared its findings through conference presentations and publications for provincial and national audiences. To facilitate the uptake of research findings, the team also produced a range of jointly authored reports including an evaluation framework, site profiles, home visiting literature review, quantitative and qualitative reports, summary of findings and recommendations, and site-specific reports. The team disseminated electronic and paper copies of these reports and posted them online: www.kidskan.ca. The team also distributed these reports to 90 stakeholders from across the province who attended a day-long meeting to discuss and provide feedback on project findings. After this meeting, the team revised the final reports based on the feedback we received and redistributed them. Additional knowledge transfer activities with specific sites are planned for the future as a result of additional funding we have received.

The team's findings suggest that program staff needed to achieve strong relationships with their clients before the clients would be receptive to new information, try new ways of parenting or interact with other members of the community. These findings were corroborated through a literature review of home visiting programs. The team believes these findings can be generalized to other kinds of intervention programs. With robust research evidence to support it, trust and relationship building should be considered an essential practice for community-based service providers who are working with vulnerable populations.

Despite the collaborative nature of the evaluation, and a high level of interaction with decision makers, it is difficult to know if this evaluation will promote large-scale policy change at the provincial level. It is more likely that community practices will change, and small-scale policy changes may be introduced. As researchers, the team was situated between community practitioners and advocates, who were managing the program on the ground, and government representatives with provincial responsibility, a situation that was occasionally challenging due to differing opinions about how the program should be implemented, managed and evaluated.

As is widely acknowledged, relationship building is integral to working effectively with decision makers. That said, researchers cannot compromise the strength and relevance of the research they conduct to appease decision makers; research needs to be both highly valid and highly policy relevant to have the best chance of improving policy and practice (Martens & Roos, 2005). Finally, the team's advice to others is to try not to get discouraged; while working this way is much harder than conducting researcher-driven studies, it can also be more energizing, and much more likely to make a difference.

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Empowering Communities to Support School Nutrition

Case 8 - School nutrition programs in remote First Nations communities of the western James Bay region: impact, challenges and opportunities

Rhona Hanning, RD, PhD, Associate Professor,
Department of Health Studies and Gerontology and
Propel Centre for Population Health Impact, University of
Waterloo, Waterloo, ON

Kelly Skinner, MSc, MPH, PhD Candidate, University of
Waterloo, Waterloo, ON

Michelle Gates, RD, MSc, PhD Candidate, University of
Waterloo, Waterloo, ON

Allison Gates, RD, MSc, PhD Candidate, University of Waterloo, Waterloo, ON

Len Tsuji, DDS, PhD, Professor, Department of Environment and Resource Studies, University of Waterloo,
Waterloo, ON

Corresponding author: Rhona Hanning, rhanning@uwaterloo.ca

Introduction

Aboriginal Canadian children living in remote, northern First Nations communities are at high risk for unhealthy diets, due largely to low socioeconomic status and reduced access to healthy foods. The result can be malnutrition, which contributes to a high prevalence of obesity and chronic disease that can burden this population.

We attempted to obtain community-specific information about children's and adolescents' food intake to address this population health problem. We initially worked with the Western James Bay First Nations to tailor, validate and implement the University of Waterloo School web-based Eating Behaviour Questionnaire. The results identified alarmingly high rates of obesity and low diet quality. To identify opportunities for change, we employed a collaborative, community-driven approach based on a foundation of trust, equity and respect among community and academic partners (Skinner, 2006). School nutrition programs were seen as a feasible and desirable intervention to improve the health of this vulnerable population.

Our objectives were to develop and implement three distinct, school-wide nutrition programs in Fort Albany, Kashechewan and Attawapiskat First Nations in Ontario and evaluate their impact on student food intake. We also wanted to describe what worked or could be improved from the perspectives of community stakeholders. Ultimately, the goal of the research was to empower community members and support sustained approaches to reduce inequities in nutrition and health in remote First Nations communities. Although the primary relevance of this work is for the communities involved, by underscoring the perceived program and community-level barriers, we hope also to influence key decision and policy makers to take appropriate action to reduce health inequities in Aboriginal communities.

This project involves collaboration between academic and First Nations communities to implement school-based nutrition interventions and improve access to quality healthy diets. It highlights the factors that support sustainable change in remote settings, including comprehensive program design and provision, supportive infrastructure such as modified school curricula and policies, greenhouse gardens, funding, and local champions and volunteers.



Project description and lessons learned

Between 2004 and 2010, we developed and implemented programs based on social cognitive theory to improve students' diets. We provided healthy foods at school and, in some programs, through school food policy, student curriculum and parent/community education. Academic partners helped to plan the programs; provided seed funding; trained community assistants in program implementation, menu planning, food purchasing and grant writing; supported curriculum intervention; and coordinated program evaluations. Members from the school, health unit and the community-at-large were included on each community project advisory committee. However, Band Council involvement was generally at arms length (letters of support for funding applications, awareness of the project, receipt of school feedback reports). This participatory approach was fostered through the ongoing presence of academic partners and students in the communities.

Our project-related interactions with advisory committee members and their networks and workplaces further solidified community support. Long-term commitment and presence of the same researchers (that is, continuity) is of utmost importance when undertaking community-based research, especially in Aboriginal communities. Although we incorporated formal project knowledge exchange activities to further nurture this relationship, our informal interactions with community members during shopping and other daily activities was probably even more important than the formal interactions. Community support is not garnered in a day and must be nurtured over time.

We assessed changes in food and nutrient intakes for grade 6 to 10 students using the University of Waterloo School Web-based Eating Behaviour Questionnaire, which incorporated a 24-hour recall adapted to include local traditional foods as well as photos for portion estimation, questions on food frequency and knowledge, self-efficacy and intention questions adapted from the Pro Children questionnaire (De Bourdeaudhuij et al., 2005). We assessed process and impact evaluations from case documentation, interviews and focus groups with students, teachers and community members, and analyzed them thematically. The study was approved by the Office of Research Ethics, University of Waterloo and passive parental consent for student participation was adopted at the request of project advisory committees in each community. There were no refusals in response to parent information letters; the reduced family burden of passive versus active consent likely supported the high response rates.

Results showed that programs varied from high functioning (comprehensive design, daily food provision, modified curricula and policies, and a greenhouse garden) enabled through sustained funding and a local champion, to low functioning (inconsistent provision of snacks) due to inadequate funding, poor infrastructure and a lack of volunteer support. During focus groups conducted post-program, community members expressed pride in their programs. Teachers remarked on improved classroom behavior on days when food was provided, including increased alertness, motivation and attentiveness. Students enjoyed the foods and interactive lessons and increased their exposure to and preferences for new food choices. Diet surveys showed that, in the short term, participants' intakes of food groups emphasized within the programs, and those foods' respective nutrients, were significantly increased. However, at long-term follow-up, significant improvements were not sustained in spite of students' improved knowledge (where curriculum was incorporated) and intentions to eat healthier. Moreover, overall diet quality remained dominantly within the "needs improvement" range. The lack of sustained benefit related, in part, to reduced program integrity due to limited resources.

Implications for research, policy and practice

Our research adds to literature showing the prevalence of overweight and obesity as higher, and diet quality poorer, in Aboriginal children and adolescents than in the general population. It demonstrates that school nutrition programs can positively affect the eating behaviour of vulnerable children living in remote Ontario First Nations communities under ideal conditions and, ultimately, promote health equity. However, there are numerous barriers.

School nutrition programs in remote, isolated communities have high needs for resources, including funding, food, personnel and infrastructure if they are to have a sustained effect and reduce health inequities. While the research team provided seed funding and grant writing assistance, external grants were insufficient to meet high local food costs. Unlike in urban communities, fundraising is also insufficient, particularly because there are few local businesses with which to partner. Financial support provided through First Nations Band Councils was inconsistent due to competing priorities.

The limited availability of healthy food in community stores was a huge constraint. The only school to consistently meet policy guidelines for acceptable healthy foods and beverages chartered an airplane to deliver outside food. In a remote setting, the logistics of obtaining, storing, preparing and serving sufficient quantities of healthy food for up to 400 students can be incredibly challenging.

Most school nutrition programs do not provide funds for personnel, so volunteer coordinators are required. Only one of the three communities had a long-standing school nutrition champion and in that community a high functioning program has evolved over years. In the two other communities, it was more difficult to identify a school nutrition program volunteer and, when one was identified, that person was not consistently available. Although these schools were very supportive, they often struggled with staffing needs and could not meet program demands.

These schools operated out of portable classrooms; facilities for food and beverage preparation, delivery and storage were minimal and, in some cases, non-existent. Yet even suboptimal programs are perceived to offer benefit for many children who come to school hungry.

Programs and materials must be tailored to meet the needs of specific populations. In the community where an educational component was initiated, curriculum needed to be adapted to children's learning styles, which favoured interactive lessons such as food preparation or taste testing. In addition, lessons had to accommodate limited learning resources, a wide range of literacy levels in students, students with special needs, and variable school attendance related to absenteeism and community-level challenges (for example, flooding and H1N1). Although findings from one community can inform new projects and programs, the individual nature of each First Nations community, even among those in close proximity, means that separate relationships must be forged, and interventions and methods tailored to each community.

Research and knowledge translation are enhanced by active participation of research partners and community members. Our research benefitted from close, long-standing relationships between the research team and First Nations communities. However, this aspect of our research has also been challenging due to the high cost of transportation to remote communities and the expense of long visits. We used numerous knowledge translation strategies, including written and electronic reports sent to the First Nations Band Council, Health Unit and school, community newsletters, and radio and newspaper articles. The

dissemination strategies achieving the best reach and visibility have been in-person meetings and healthy community feasts. At one such feast prepared by the research team and local students, more than 12 percent of the community attended and readily participated in brief surveys to evaluate parental perceptions of the school nutrition program and in a raffle for healthy foods that are not always locally accessible.

From our experience, the keys to success in First Nations school nutrition interventions are sustained and sufficient funding, consistent volunteer support or paid personnel (preferably a local program champion), adequate facilities to prepare, store and distribute food, and consistent access to healthy food. Despite the challenges and barriers that we have described, students, teachers and parents valued the programs. There is great potential for school nutrition programs to positively impact the dietary intake and health of First Nations children. These programs continue to address approaches to assess and improve the situation regarding food insecurity. The work also includes school-based intervention and support for sustainable access to healthy and traditional foods. The authors hope these research findings will help support local needs and spur systemic action to address inequities.

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Population Health Intervention Research Casebook Commentary

Setting the stage for an expert commentary

Penny Hawe, Founding Director, Population Health Intervention Research Centre, University of Calgary, and Ted Bruce, Executive Director, Population Health, Vancouver Coastal Health, were invited to reflect on the current state of population health intervention research in Canada from the perspective of a researcher and public health decision maker, respectively. Given the diverse approaches to this nascent field of research, we conclude the casebook with their insights to demonstrate how the voices of researchers and decision makers can work together and to reflect on the potential for growth in population health intervention research and the infrastructure needed to develop and support it.

How do you see population health intervention research differing from other approaches to health research?

Ted Bruce (Ted): Unlike traditional health promotion or health education approaches that often target individual risk factors, population health intervention research looks further upstream at policies and barriers that affect the capacity for whole populations to make change. Population health intervention research is not just about evaluating a specific program aimed at individuals; it is also about looking at the broader policy framework within which an intervention is being developed. It is the whole context.

Penny Hawe (Penny): Yes, I agree. Though health promotion people would say they have been in the policy arena since the 1986 *Ottawa Charter for Health Promotion* and are dealing with structural issues. But to truly realize the value of research in sectors like taxation policy or the environment, we have to give it more encouragement. Population health intervention research is trying to do that. It's about making the tent broader and privileging a type of research about structural solutions to ill health that has not been in the spotlight.

In what ways do the projects presented in the casebook add to our understanding of population health intervention research?

Ted: The range of cases shows us that population health intervention research is emerging and transitioning to a more exciting and effective level.

The research is becoming more sophisticated and we are developing a greater understanding of how to use it; models of good practice that consider policy and social determinants are starting to be documented and evaluated. There is still room for improvements around the articulation of the intervention's policy focus and how interventions will influence fundamental determinants of health.

Research is developing a more comprehensive focus, moving from looking at specific program elements to looking at complex elements in which the program is situated. For example, a program might be designed to help an individual get into the job market, but population health intervention research would focus on why individuals from a certain population group might not be able to get into the job market in the first place and try to address that.

This shift to more upstream interventions is what is exciting.

Penny: I am going to sound a little more negative! The cases add to our understanding of doing population health intervention research, but they reflect just part of the definition of what population health intervention research is. But that's because of how the case studies were set up. You invited applications in obesity and mental health. You defined sectors outside of health in terms of examples of schools or unions collaborating with health sector people to deliberately improve health. Look, don't get me wrong, I love this stuff. It's what I do in my own work. But you didn't get descriptions of the impact of employment policies on health. You didn't get researchers looking at global trading networks and health, for example. So I am just commenting on the selection bias.

That said, we can take away some lessons from the casebook.

Researchers were hampered by not having enough data on the people and infrastructure they were working with. This is partly because our routine data collection systems are essentially designed to support health care administration. Population health intervention research needs whole new data structures.

The value of partnerships and relevant research is also important. Academics listened to the policy makers. They were asking questions that were relevant to what policy makers wanted to know. They were involving partners in analysis and interpretation and in study design too. If population health intervention research is going to be successful it will be driven by these policy level interface questions.

Many of the cases were unable to bring about longer-term changes because the system did not seem ready to invest in getting these health outcomes on a regular basis, even after investigators had shown how it could be done. It's this screwy idea that we all still seem to retain about prevention. As a society, we regularly allocate resources to treatment services but we expect innovative preventive interventions to be sustained by community volunteers. I want to be part of a society that starts allocating our resources differently.

What competencies and skills are needed by population health intervention research teams, including researchers and decision makers?

Penny: Population health intervention research competency identification and development is being supported through some recent Strategic Training Initiative in Health Research grants.¹ We need to develop well-rounded researchers with broad research, communication and policy analysis skill sets, although good population health intervention research can also be done using secondary data sets, where you don't need to get up close and personal with anyone!

Ted: Population health intervention research is not a bounded discipline; there are going to be people working, for example, in urban planning and ecology who are doing population health intervention research work. So population health intervention researchers must be interdisciplinary in nature, or at least be able to work in a cross-disciplinary environment. That does take a certain amount of competency and courage. Other key competencies include good community engagement competencies and a certain level of knowledge around community development including being a strong communicator at different levels, whether it is

¹ Please visit <http://www.cihr-irsc.gc.ca/e/22174.html> for more information on the Canadian Institutes of Health Research Strategic Training Initiative.

working in the community or with different levels of government. There is also the importance of being a team player. Not everybody has the full range of knowledge and competencies required to move some of these agendas forward.

Given the diverse and sometimes political environment, leadership skills are essential. This includes specialized knowledge and understanding approaches to advocacy, understanding decision making processes in complex environments, and understanding models of change.

Penny: The other skill I'd throw in is journalism. Imagine how exciting it would be if journalists were writing about population health as a science with the same excitement as they write about genes or asteroids. I know journalism is not a population health intervention research competency, but without it population health intervention research will not thrive.

Discuss the importance of population health intervention research for promoting health equity and effecting change.

Ted: For me, fundamentally, population health intervention research is looking at the question of equity—and population health intervention research must consider the inequitable distribution of power and resources. Even though health promotion programs may be aimed at vulnerable populations with inequitable health status, they may not be looking at the fundamental change of power relationships or policy that is going to bring about a real change in health status.

Penny: I agree. What also worries me is how far down the path of biological explanation some people are going to go to account for the mechanism for why some people are healthy and others are sick. Do we really need to have brain scans of kids showing how horrible it is to be bullied or to live in tough circumstances? Some concerted action is needed on social and population health science data alone. Biological plausibility is terrific, but not if it delays action.

What are the key success factors and challenges for moving forward with a population health intervention research agenda?

Ted: We need to clarify what we mean by population health intervention research. Researchers need to clarify the policy target at the outset and be explicit about the overarching policy framework that is affecting the population's health. Also, there needs to be more longitudinal research. Funding tends to be of a temporal or short-term nature, yet the work we are doing needs to be longitudinal if we are going to have an impact. We do have some dedicated research funding initiatives around population health intervention research, and we cannot lose that. Research should be embedded into the community since the community ultimately must support and sustain the intervention. The field must focus on improvements to our social and cultural environments for improving the health of populations, understanding the context for interventions—what are the barriers or what made them successful—and understanding the elements that would be required for policy change over time.

Penny: I do not think that we should tie funding to the traditional goals and risk factors that we have always had. I think we need to let the field innovate a bit more through having funding competitions and opportunities where the approach is left open.

Identify some key future policy needs, concerns or issues in Canada and reflect on how population health intervention research may contribute to addressing them.

Ted: If we do not address income and power inequalities in society we are going to suffer on all kinds of measures as a society and as individuals. That, to me, has to be one of the highest priorities that we attend to in population health. I think the health sector is in a special place to be able to talk about that in a language that is not threatening or ideological. We need to be at the table to help people understand what makes healthy societies and healthy people.

In parallel to this, we need to focus on protective factors that are in place across communities. We need to look at why some communities do better than others even in the face of some pretty miserable circumstances and explore some of those protective factors and policies such as strong social support systems.

Penny: Yes, and we need to learn how to reframe the social determinants of health so it is not dismissed as ideological. That's been a barrier. We also have to start incorporating more cost-benefit analyses into research studies. We have to show exactly how building equitable societies and a sustained prevention system will deliver better outcomes.

I would also like us to rethink the priority we give to future sustainability as a criterion for researching which new interventions may be worthwhile. In basic science and health care, we never seem to say, "I am sorry. You cannot do this innovative stuff because we may not be able to afford to implement the results." But in public health we often shoot ourselves in the foot at the start and say to researchers: "You are only allowed to generate a particular type of knowledge," one at present grounded in an under-resourced, under-valued system where only minimal remedies are seen as feasible. I think we need to raise our sights and give society the ammunition to build a better system.