
Status report

Identifying equity-focussed interventions to promote healthy weights

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Abstract

Introduction: We developed screening criteria to identify population health interventions with an equity focus for inclusion on the Public Health Agency of Canada's Canadian Best Practices Portal. We applied them to the area of "healthy weights," specifically, obesity prevention.

Methods: We conducted a review of the literature and obtained input from expert external reviewers on changes to midstream environments. Interventions had to identify outcomes for groups with an underlying social disadvantage. We included papers with a focus on equity and vulnerable populations, intervention and/or evaluation studies, social determinants of health and healthy weights or obesity prevention. We then appraised the shortlisted studies for quality of evidence to determine eligibility for inclusion as promising practices on the Canadian Best Practices Portal.

Results: Few of the references reviewed passed the equity screening criteria (26 out of 2823 published papers reviewed, or 0.9%). Six (of the 26) interventions qualified as promising practices.

Conclusion: The ability of the equity screening criteria to distinguish midstream-level interventions for obesity prevention suggests that the criteria have potential to be applied to other public health topics. What is most important about our work is that the Portal, which is no longer being updated but is still accessible, was broadened to include interventions with a focus on equity.

Keywords: *intervention studies, equity, vulnerable populations, social determinants of health, obesity, healthy weights, population health, best practices, midstream environments*

Introduction

There is significant evidence that the burden of chronic disease is not evenly distributed across the population in Canada. These health inequities do not occur randomly; instead, they point to differences in the distribution of the social determinants of health (e.g. education, employment, income, gender, etc).¹⁻⁵ For example,

people with fewer social and economic advantages are generally less healthy than those who are better off, suggesting a wealth-health gradient.⁶ It is important to understand health differences that occur across population groups, in order to develop policies and programs that can reduce health inequities while improving health for all.⁷

Highlights

- We developed screening criteria to identify equity-focussed, population-health interventions for inclusion on the Canadian Best Practices Portal.
- The criteria were based on the literature and input from experts. We used the area of "healthy weights"—specifically, obesity prevention—to test the equity screening criteria.
- Few of the references reviewed passed our equity screening criteria (26 out of 2823). Six interventions qualified as promising practices.
- Our criteria have potential to be applied to other public health topics.

This paper describes a project undertaken to identify best and/or promising practices associated with population health interventions that have an equity focus, for inclusion on the Canadian Best Practices Portal ("the Portal"). The Portal is a searchable database of effective population health interventions data and resources that is maintained by the Public Health Agency of Canada (PHAC). The project is part of PHAC's ongoing efforts to reduce health inequities and promote evidence-informed decision making.

Since 2006, the Portal has provided robust evidence to public health professionals so they can adapt and implement interventions most appropriate to their settings.

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PHAC describes “best and promising practices” as interventions, programs or initiatives that have demonstrated desired changes through the use of appropriate, well-documented research or evaluation methodologies.⁸⁻⁹ *Best practices* have demonstrated, through multiple implementations, high impact (positive changes related to desired outcome); adaptability (and transferability to other settings); and high quality of evidence. *Promising practices* show potential (or “promise”); they may be in the earlier stages of implementation. They have demonstrated medium-to-high impact, high potential for adaptability and suitable quality of evidence (e.g. strong theoretical basis and rigorous evaluation study design).

Health equity

Braveman and Gruskin¹⁰ propose that “... equity in health can be defined as the absence of disparities in health (or in the major social determinants of health) between social groups who have different levels of underlying social advantage/disadvantage—that is, different positions in a social hierarchy.”^{10,p254} This operational definition highlights two important points for evaluating and measuring health equity outcomes. First, it suggests that an equity indicator should be able to distinguish changes in health disparities, i.e. it should be able to distinguish the underlying social advantage, disadvantage or gap.¹¹ A goal of public health is to reduce such gaps in health outcomes between people living in conditions of disadvantage and people living in comparatively more advantaged conditions, or to universally improve health outcomes across the social gradient for all.¹²

Second, Braveman and Gruskin’s definition of health equity suggests that outcomes could also be measured at the midstream level of intervention. The midstream level is external to the individual person, and consists of environments or conditions in which people live, work, play and learn. An example of a midstream environment is the built environment (a measurable aspect of which is walkability). A midstream environment serves as a crucial linchpin between proximal, intraindividual factors (e.g. knowledge, attitudes, behaviours) and more distal, structural factors (e.g. policy, legislation, administrative activity).¹³ Improvements

in midstream environments help individuals to live healthier lives. Changes in midstream environments (midstream “outcomes”) serve as intermediary markers of action to reduce health inequities, especially when the effects of interventions on health will likely happen further in the future.

Whitehead¹⁴ suggested that health equity has moral and ethical dimensions—that some differences in health are avoidable and remediable and therefore unfair and unjust. These principles have become widely acknowledged in the field of population health. While health status is influenced by a complex array of biological factors, research suggests that health inequities also appear to be caused by underlying factors related to social position within a particular societal context.¹⁵⁻²⁰ Societal contexts create social stratification, which leads to differential exposure to health-damaging conditions, differential vulnerability and differential consequences of ill health.¹⁵

Project description

The purpose of the project was to populate the Portal with new interventions that have a focus on equity. We limited the project’s scope of equity analysis to four social determinants of health: income, social inclusion, built environment and education or literacy. The purpose of the limit was to (1) test the relevance or relative strength of the social determinants as pathways to health equity; and (2) to ensure the project scope was realistic. The area of healthy weights, which is a priority for the Public Health Agency of Canada, was used to develop and test the criteria. Specifically, we focussed on obesity prevention. We chose this topic, in part, to explore the pathways that can influence healthier eating and physical activity by looking at the potential interactions among select social determinants of health.

Methods

Project steps

The project steps included

(1) developing a set of equity screening criteria that can be applied to different public health topics to identify interventions that act on the selected social determinants of health to promote health equity;

(2) conducting a search of published and grey literature for studies of relevant interventions on healthy weights and obesity prevention;

(3) reviewing existing healthy weights and obesity prevention interventions already on the Portal to avoid duplication;

(4) applying the equity screening criteria to the search results to generate a shortlist of relevant studies;

(5) appraising the quality of evidence of the shortlisted studies using the Portal’s Intervention Assessment Screening Tool;

(6) contributing equity-specific fields to the Portal’s Annotation Template, which is used to summarize key features of interventions; and

(7) using the Annotation Template to record information on the studies or interventions that passed the Assessment Tool.

These project steps were informed by several guiding papers on developing and implementing policies and programs that address underlying factors that contribute to inequities²¹ and conducting reviews with a focus on health equity.^{22,23}

Development of equity screening criteria

Midstream environments appear to influence health outcomes, including inequities¹¹ and obesity.²⁴⁻²⁷ Examples of midstream environments specific to obesity prevention include food environments (e.g. whether healthier foods are affordable, which pertains to income as a social determinant of health) and physical activity environments (e.g. the walkability of the area, which pertains to the built environment as a social determinant of health).

Despite the importance of midstream environments on inequities and obesity, however, we were unable to find any criteria in the literature to screen for midstream, equity-focussed interventions. Therefore, we had to develop equity screening criteria for midstream interventions. Table 1 presents our equity screening criteria, which are specific to obesity prevention as a case example, but are intended to be adaptable to different public health topics.*

We developed the equity screening criteria based on a review of literature and feedback from five external reviewers with expertise related to population and public

* We approached screening without a predefined clinical definition of obesity. We selected papers about obesity, with obesity labelled or categorized by the authors.

TABLE 1
Equity screening criteria developed for the Canadian Best Practices Portal, as applied to the public health issue of obesity prevention

Characteristics	Inclusion criteria	Exclusion criteria
Time frame	Published within the last 10 years, i.e. 2003–2014 (this aligns with the Assessment Tool)	Published before 2003
Language	English	Language other than English
Geography	Worldwide	No exclusions
Type of document	Must be a <i>primary</i> source that reports on the findings of a study or evaluation (may be published literature or grey literature)	Document is an opinion piece, e.g. commentary, editorial, letter to the editor, or a news article
Topic of interest (focus)	Must explicitly mention obesity or overweight in/as one or more of the following: <ul style="list-style-type: none"> Title and/or abstract Intervention goal/objective Intervention strategy/activity Measured indicator or outcome Downstream outcome (even if it is not yet measured) 	<ul style="list-style-type: none"> No explicit mention of obesity or overweight Obesity/weight is positioned as a <i>predictor, risk factor, or correlate</i> of other conditions (e.g. heart disease), rather than as an <i>outcome</i> of an intervention Deals with underweight Deals with eating disorders Concerns nutrition that does <i>not</i> relate to obesity: hunger; malnutrition; vitamins; minerals. (Note: Obesity-related nutrition includes fresh fruits and vegetables; energy dense foods (high in sugar, fat or calories); and whole grains)
Intervention	Must include an intervention, <i>and</i> must also meet one of these criteria: <ul style="list-style-type: none"> Acts on key determinant(s) of health (i.e. income, social inclusion, built environment, education/literacy) at the organizational, institutional, community or population level in order to promote health equity for obesity prevention Does not explicitly aim to promote health equity for obesity prevention in its goals/objectives or strategies, but the reported outcomes distinguish effects on health equity for obesity prevention 	<ul style="list-style-type: none"> An intervention is not mentioned Intervention(s) mentioned, but focusses exclusively on the following (i.e. does not also act at the determinants level): <ul style="list-style-type: none"> Medical determinants of health (e.g. health care, drug treatments, surgery) Individual-level strategies (e.g. behavioural, diaries, lifestyle, curricular, self-management, coaching, counselling, motivational, skills training, informational) The provision of portable equipment (e.g. pedometers, sports equipment)
Population	Must include one of the following: <ul style="list-style-type: none"> A population that the authors specify as living in conditions of disadvantage (social, economic or geographic) Midstream environments in which people live, work, learn or play (e.g. food environment, physical activity environment) 	<ul style="list-style-type: none"> Includes populations who are considered to be at higher risk of obesity due to genetics or biology rather than to social, economic or geographical conditions Focusses only on populations living in more advantaged conditions
Evaluation	Must include an evaluation on the effects of an intervention, in one of the following ways: <ul style="list-style-type: none"> In meeting intervention goals/objectives In affecting people's morbidity, mortality, well-being or quality-of-life 	<ul style="list-style-type: none"> An intervention (possible or actual) is described, but no evaluation of its <i>effects</i> is reported Formative or process evaluations are included but without <i>also</i> an evaluation of the <i>effects</i> of the intervention

Continued on the following page

health, health equity and social determinants of health. We reviewed literature on existing evidence and theory on mid-stream interventions to reduce health inequities and/or obesity, specifically those with visual conceptual models or

organizing frameworks. The focus on mid-stream interventions was intended to strengthen the “evidence bridges” between action on environments and health equity outcomes. The types of literature we reviewed included systematic reviews,

narrative reviews, conceptual papers and discussion papers. We presented the draft set of screening criteria to the external reviewers, who were asked what was most promising about the criteria, whether there were gaps in the criteria and if so how to

TABLE 1 (continued)
Equity screening criteria developed for the Canadian Best Practices Portal, as applied to the public health issue of obesity prevention

Characteristics	Inclusion criteria	Exclusion criteria
Outcomes	<p>Must report <i>positive</i> outcomes for one of the following:</p> <p>Midstream environments—outcomes indicating availability, accessibility or affordability of health-promoting goods and services, such as:</p> <ul style="list-style-type: none"> • Food (e.g. food security, fresh fruits and vegetables, energy dense foods, food deserts) • Physical activity (e.g. walkability, public facilities, public transit, green space, active transportation infrastructure) <p>People—outcomes must be specific to people living in conditions of disadvantage (who may or may not be compared to people living in more advantaged conditions) and must be one of the following:</p> <ul style="list-style-type: none"> • Weight-related (e.g. BMI) • Behaviour-related (e.g. consumption of fruits and vegetables, consumption of energy dense foods, physical activity, active transportation, sedentary lifestyle) 	<ul style="list-style-type: none"> • The reported outcomes do not distinguish findings specific to people living in conditions of disadvantage (e.g., they may be part of the study sample, but outcomes are reported only for the sample as a whole) • There is no change in relevant outcomes, or they are negative • For people (not midstream environments), outcomes are reported <i>only</i> for knowledge or skills, without <i>also</i> being reported for weight-related or behavioural outcomes. (Note: Interventions that act at the determinants level use structural and environmental strategies to affect behaviours, morbidity and/or mortality, rather than exclusively using lifestyle strategies to affect knowledge, skills, perceptions and behaviour. Therefore, the salient outcomes for determinants-level strategies are behaviour and morbidity/mortality.)

address them and how to strengthen the criteria. We revised the draft criteria based on their feedback.

The finished equity screening criteria represented a new component in the Portal's assessment process. Key elements of the equity screening criteria align with the Portal's Assessment Tool (which considers impact, quality of evidence and source credibility). Interventions are not required to have a focus on equity to be accepted to the Portal, but after our project was complete, we additionally assessed all the interventions for an equity focus. The project design did not call for full testing of inter-rater reliability of the application of the equity screening criteria; however, a non-independent group of reviewers from the Propel Centre for Population Health Impact did review each potential intervention for quality of evidence as part of the usual assessment process for best or promising practices.

Search of published literature

In March 2014, we searched the published literature for papers with a focus on equity or vulnerable populations, intervention evaluation studies, the social determinants of health and healthy weights or obesity prevention. We imported a total of 3522 references into a RefWorks database: 2076 from

MEDLINE; 685 from Embase and 660 from CINAHL (after duplicates of MEDLINE citations were removed); and 101 from snowball searching (following up on references cited in the papers reviewed). We reviewed 2823 of the 3522 references imported (80.2%), due to time constraints.

Search of grey literature

In March and April 2014, we searched over 100 websites of selected, relevant organizations related to health and obesity prevention, including Canadian and international government organizations, nongovernmental organizations, university-affiliated research centres, coalitions, networks and Listservs. We also sent emails to select stakeholders to request papers on evaluated interventions.

Portal Assessment Tool, Annotation Template, new equity fields and equity icon

The core of this project was the addition of equity screening criteria to the overall Portal assessment process for interventions. However, in order to populate the Portal, we also had to use the pre-existing Portal Intervention Assessment Screening Tool (Assessment Tool) to assess the impact, adaptability and quality of evidence of the interventions to determine if they met the

requirements for a best or promising practice.

As part of our equity project, we had to revise the pre-existing Portal Intervention Annotation Template, which is used to capture information on interventions that have passed the Assessment Tool (i.e. best or promising practices), such as goals and objectives, outcomes, strategies or activities. The pre-existing Annotation Template was not designed to delineate the equity focus of interventions. Therefore, we added new fields to the Annotation Template to capture equity content from included studies and evaluations, and to contribute to the assignment of an "equity icon" indicating that the intervention passed the equity screening criteria.

The new fields included: (1) goals and/or objectives related to people living in conditions of disadvantage; (2) equity-focussed activities (e.g. activities that address economic, social or geographic barriers that limit access to opportunities and enabling resources for people living in conditions of disadvantage); and (3) reported outcomes specific to people living in conditions of disadvantage, and whether the findings were compared to those of people living in conditions of greater advantage.

Results

Published literature

Out of the 2823 references reviewed, 26 (0.9%) passed the equity screening criteria and were shortlisted as having both (1) equity content and (2) an evaluation of an intervention that acted at a midstream level to prevent obesity.

Grey literature

There were no additional evaluated interventions found in the grey literature (i.e. interventions that were not already on the Portal or found in the published literature) that passed the equity screening criteria.

For example, some interventions may have included midstream-level strategies, but lacked an evaluation component or did not report findings specific to people living in conditions of disadvantage.

Selected interventions

Of the 26 shortlisted interventions, six (23%) passed the Assessment Tool as promising practices (none met the criteria for a best practice) and were annotated for the Portal. Table 2 presents a summary of the equity content and midstream-level strategies of these six interventions. Four interventions had a food or nutrition focus (e.g. vouchers for healthy foods; subsidized boxes of fruits and vegetables; changes

to food environments). One intervention looked at the effect of changes to the built environment on physical activity. One study looked at the effects of moving to a less impoverished or an improved neighbourhood on obesity and the risk for diabetes. Five interventions were from the United States and one was from Australia. Low income was used as an indicator of inequity for all six interventions. The intervention strategies and reported outcomes of these studies reflected both health-related (person-level) and midstream levels. None of the findings were reported across the income gradient.

Twenty (77%) shortlisted interventions passed equity screening but did *not* pass

TABLE 2
Promising practices of health equity in obesity prevention interventions for the Canadian Best Practices Portal

References	Country	Population	Equity content	
			Intervention goal/strategy	Outcomes
Andreyeva T, Luedicke J, Middleton AE, Long MW, Schwartz MB. Positive influence of the revised Special Supplemental Nutrition Program for Women, Infants, and Children food packages on access to healthy foods. <i>J Acad Nutr Diet.</i> 2012;112(6):850-8. doi: 10.1016/j.jand.2012.02.019	United States	Low-income, pregnant and postpartum women with children 0–5 years of age	Provision of cash-value vouchers for healthy foods	Store-level data on the price, availability and variety of selected healthy foods in intervention stores vs. control stores
Black AP, Vally H, Morris P, Daniel M, Esterman A, Karschimkus CS, O’Dea K. Nutritional impacts of a fruit and vegetable subsidy programme for disadvantaged Australian Aboriginal children. <i>Br J Nutr.</i> 2013;110(12):2309-17. doi: 10.1017/S0007114513001700	Australia	Disadvantaged, low-income Aboriginal children (under age 18 years) living in rural area	Provision of subsidized weekly boxes of fruits & vegetables	Reported for disadvantaged, low-income children only
Coleman KJ, Shordon M, Caparosa SL, Pomichowski ME, Dziewaltowski DA. The healthy options for nutrition environments in schools (Healthy ONES) group randomized trial: using implementation models to change nutrition policy and environments in low income schools. <i>Int J Behav Nutr Phys Act.</i> 2012;9:80. doi: 10.1186/1479-5868-9-80	United States	Low-income schools	Changes to the school food environment. Other strategies: developing nutrition services as the main source for healthful eating; promoting school staff to model healthy eating	Reported for low-income schools only
Evans AE, Jennings R, Smiley AW, et al. Introduction of farm stands in low-income communities increases fruit and vegetable among community residents. <i>Health Place.</i> 2012;18(5):1137-43. doi: 10.1016/j.healthplace.2012.04.007	United States	Low-income, underserved neighbourhoods, which are designated as “food deserts”	Changes to the community food environment	Findings for low-income, underserved communities only
Gustat J, Rice J, Parker KM, Becker AB, Farley TA. Effect of changes to the neighborhood built environment on physical activity in a low-income African American neighborhood. <i>Prev Chronic Dis.</i> 2012;9(1):110165. doi: 10.5888/pcd9.110165	United States	Low-income neighbourhood	Changes to the built environment	Findings in intervention low-income neighbourhoods were compared to findings in matched low-income neighbourhoods
Ludwig J, Sanbonmatsu L, Gennetian L, et al. Neighborhoods, obesity, and diabetes—a randomized social experiment. <i>N Engl J Med.</i> 2011;365(16):1509-19. doi: 10.1056/NEJMs1103216	United States	Low-income women living with children in public housing in high-poverty neighbourhoods	Provision of a low-poverty voucher to move to a neighbourhood that is less impoverished and counselling on moving	Findings in low-income women who received the intervention were compared to findings for low-income women in control conditions

the Assessment Tool. Half of these did not pass due to lack of (or limited) information concerning any guidelines, standards or theories used in the development of the intervention. The other half did not pass due to a “limited” rating for quality of evidence. A limited rating for evidence quality would be given for limited or poor sampling (e.g. a lack of, or no mention of, a number of individual participants followed over time); a lack of well-defined inclusion/exclusion criteria for the allocation to intervention control groups; a lack of validated outcome measures; a loss of participants to follow-up; or a lack of group differences identified and controlled for in the analysis.

Discussion

The goal of this project was to identify equity screening criteria and qualifying interventions with substantive equity focus using healthy weights, specifically, obesity prevention, as a case example, and to add to the Portal those interventions that met the criteria for either a best or a promising practice. Twenty-six references had relevant interventions with equity focus; six of these were found to be promising practices with sufficient quality of evidence using the Assessment Tool.

Strengths and limitations

In our test of the equity screening criteria, our ability to distinguish 26 midstream, equity-focussed interventions suggests that the criteria were able to screen for relevant interventions and could potentially be adapted for use with other public health topics. Our criteria were also able to distinguish equity outcomes based on the operational definition by Braveman and Gruskin.¹⁰ This is crucial, as interventions intended to promote health equity must also be evaluable for health equity outcomes.

At a practical level, what is most important about our work is that the Portal now includes new interventions with equity focus. The addition of an equity icon makes it easier for users of the Portal (e.g. public health professionals) to find these interventions that have been effective in addressing health inequities. We want to note that as this paper was being written, we learned that the Portal will no longer be updated in the future, although it will remain online and accessible. While this means that the Portal will no longer be populated with new interventions, we

have created a screening tool that may be used for identifying equity-focussed interventions. It may also be adapted for public health topics other than obesity prevention. In fact, our screening tool has been used (by others) to identify 41 equity-focussed interventions on the Portal for other public health topics. This work has been used in the creation of a document titled “Toward Health Equity: A Tool for Developing Equity-Sensitive Public Health Interventions.”²⁸ This document serves as a practice tool to support the development of equity-sensitive public health interventions.

While we were able to find 26 relevant interventions, many others were excluded from our project because they were exclusively aimed at individual-level change, or clinical settings. This finding indicates that individual, behaviour-based interventions still dominate the field when it comes to obesity prevention. Among the 26 shortlisted interventions, only six met the standard for quality of evidence using the Assessment Tool. There may be additional interventions we did not find, because we reviewed only 80.2% of the references we reviewed in our published literature search. However, this does not affect our findings significantly, as we were not doing a comprehensive review, and were only looking to see whether our screening criteria could be applied to identify obesity prevention interventions with an equity focus.

All six of the included interventions qualified as promising practices using the Assessment Tool. None qualified as a best practice because the interventions (1) had short-term outcomes of less than six months; (2) had low impact (i.e. positive outcomes for a small proportion of the target population); (3) were only implemented once (e.g. a pilot); or (4) required specialized skills for implementation. The first two reasons relate to the duration and reach of the outcomes. The latter two reasons relate to external validity, or the extent to which a study or evaluation can be generalized to other populations and settings. In order to move from promising practices to best practices, future midstream interventions need to be evaluated in the longer term and effect greater impact (e.g. by using different intervention strategies). It may take years before actions on midstream environments translate into improved health or reduced health disparities.

The six intervention studies included in our project used income as an indicator of inequities. However, income is not the only indicator of inequities. We suggest using the PROGRESS-Plus framework^{29,30} as a way of standardizing the examination of inequities. The framework outlines various measures of inequities, and is incorporated into the Equity Checklist for Systematic Review Authors authored by Ueffing et al. for the Campbell and Cochrane Equity Methods Group.²³

At the minimum, outcomes specific to people living in conditions of disadvantage need to be reported. However, inequities are based on underlying differences. Therefore, the evidence base could be improved with studies that compare outcomes for people living in conditions of disadvantage versus people living in conditions of comparative advantage, either as groups or across the gradient. If inequities are reduced, people living in conditions of disadvantage would improve at a greater rate than those living in more advantaged conditions. At the least, interventions should not contribute to an increase in inequity. None of the six interventions in the present project compared outcomes between groups or across the gradient (some did, however, compare outcomes with a low-income control group).

Conclusion

Our project focussed on midstream interventions for obesity prevention. We recognize that such interventions are only part of a larger societal effort to reduce health inequities. The worldwide obesity epidemic is not caused by a single factor or domain (e.g. society, culture, technology, physical or natural environment), but by combined effects of the interaction of multiple factors and changes in the environment.³¹ Multi-scale, intersectoral approaches are needed to tackle health inequities^{15,32} and prevent chronic diseases.³³ We hope our approach to identifying effective, equity-focussed interventions contributes to a growing evidence base that translates into action to reduce inequities and improve quality of life for all.

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Conflicts of interest

The authors have no current or anticipated conflicts of interest.

Authors' contributions

Each author contributed equally to the conceptualization, compilation and writing of the report.

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