The Space in Between: Healthy Public Policy
Development in Canada’s Provincial North

by

Rebecca Hasdell

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for the degree of Doctor of Philosophy
Dalla Lana School of Public Health
University of Toronto

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Abstract

Healthy public policy is a cornerstone of public health practice, and a key strategy for creating enabling environments for health. A recent priority has been to better account for and integrate context into healthy public policy-making, including in the design, execution and evaluation of population health interventions. Healthy Public Policy may be an important tool for promoting health in the smaller cities and rural regions that comprise Canada’s Provincial North. Populations living in these regions share common health challenges and bear a disproportionate burden of poorer health outcomes compared to their urban counterparts.
The objective of this research was to explore healthy public policy development for smaller cities and rural regions. An empirical focus on retail food environments in Canada’s Provincial North captured the contextual scale needed for this research aim. Through a community-university partnership in Northern British Columbia, I asked: (1) How is context accounted for and integrated in population health intervention planning? (2) What features of local context are most important to measure to build an evidence-base for action?

I employed an interpretivist methodology and a mixed-methods approach, adopting a exploratory sequential design. Over the course of two years embedded in the field, I engaged in participant observation, and conducted workshops and key informant interviews to design a locally-relevant retail food environment assessment plan, then conducted environmental observation of stores to quantify features. Finally, I completed in-depth interviews with retail store operators to further examine qualitatively their experiences of contextual factors.

I found that institutions, settings and communities are organized according to the regional connectedness of smaller cities and adjacent rural regions, which has implications for healthy public policy-making in Canada’s Provincial North. Regional connections engender contextual features that are important to measure and understand, but capacity challenges in public health as well as retail practice limit data collection and evidence use at this scale. Existing strategies such as partnerships and community-engagement planning utilized by public health practitioners should be preserved. Additionally, new partnerships with retailers are needed to identify contextual priorities for future action.
For Jill

Always following

In the example you set
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1 Introduction

Healthy public policy is a cornerstone of public health practice, and a key strategy for creating enabling environments for health. Healthy public policies are policies in sectors outside of the health care sector that have an impact on health (Fafard 2008). Recently, there has been a revived focus on healthy public policy through the lens of population health interventions which target physical, economic and social environments (McLaren and McIntyre 2017). These approaches have origins in socio-ecological and settings models for fostering supportive environments to health (Dooris 2009). In particular, a recent priority in healthy public policy work has been to better account for and integrate context into the design, execution and evaluation of population health interventions (Craig et al. 2018; Shoveller et al. 2016; Hawe et al. 2011).

The problem of healthy public policy development in smaller cities, and rural and remote regions is an empirical gap in the literature, but one that offers an opportunity to interrogate contextual considerations in healthy public policy-making. Evidence points to important contextual differences in small and rural communities related to social determinants of health. However, these features have not been fully actualized or interrogated through research, policy and practice to date. It has been observed that “policies and strategies for improving rural health are not typically evidenced-based, focusing instead on increasing the workforce and improving access to healthcare services in remote and small rural communities rather than on government and community policies related to rural determinants of health” (p. 29, White 2013). This is important, as non-urban residents face known population health disparities, with poorer health outcomes, including higher rates of chronic disease (Pong et al. 2009).
Retail food environments have been emerging in Canada (Minaker et al. 2016; Mah et al. 2016), and other jurisdictions, as a useful setting for healthy public policy development (Lake and Townsend 2006). Food environments that provide equitable access to nutritious foods have long been viewed as central to healthy community planning and the healthy public policy enterprise (BC Centre for Disease Control 2018). Similarly to the gaps in empirical examples of healthy public policy development in smaller communities and rural regions, studies of the retail food environment have demonstrated that disparities in access and availability may be complicated by contextual physical, social and cultural features of place unique to rural environments (Cummins et al. 2010; Lucan and Mitra 2012).

My thesis takes up the empirical study of healthy public policy planning incorporating context, through a community-university partnership around retail food environment intervention planning in the smaller cities and rural regions of Northern British Columbia, Canada. This study was conducted under the umbrella of Food Retail Environments Shaping Health – Intervention Toolkit (FRESH-IT), a knowledge to action grant to examine practical strategies for moving from food retail environment assessment to intervention in smaller, rural, and remote jurisdictions across Canada.

1.1 Research aim and objectives

In this thesis, I employed an interpretivist methodology and a mixed-methods approach, adopting an exploratory sequential phased design, in order to examine retail food environment planning and intervention in Northern British Columbia, Canada, one of Canada’s ‘Provincial Norths’ (Coates and Poelzer 2013).

The main objective of this study was to examine healthy public policy development for smaller cities and rural regions. Specifically, I ask the following research questions:
(1) How is context accounted for and integrated in healthy public policy planning?

(2) What features of local context are most relevant to developing healthy public policies?

1.2 Thesis organization

This dissertation is a thesis by manuscript, in accordance with the University of Toronto School of Graduate Studies Degree regulations. It is therefore organized to present the theoretical foundations (Chapter 2), substantive gaps (Chapter 3) and methodological approach (Chapter 4) that inform the research, and three standalone manuscripts which are distinct chapters in response to conceptual and substantive gaps (Chapters 5, 6 and 7). For each manuscript, I include a preface with the submission status, intended venue for publication, and contributions by co-authors. I conclude with a substantive discussion across findings, and directions for future research and policy (Chapter 8).

Chapter 2 reviews major traditions for examining context in public health. I first provide definitions of context. I then review major theoretical traditions and approaches for defining contextual influences in examining health behaviors and outcomes, and for designing appropriate responses.

Chapter 3 examines healthy public policy for smaller cities and rural and remote regions as an empirical area well-suited to examining contextual influences in policy-making. I define healthy public policy and discuss its relevant application to smaller, rural and remote regions. I then present retail food environments as a setting for healthy public policy-making and discuss how context has been addressed in this literature.

Chapter 4 outlines the methodology employed in this research. I situate my project in two methodological approaches that are aligned with the theoretical review of this thesis:
community partnered research and interpretive approaches. In line with these methodological approaches, I discuss my epistemological and personal standpoint in relation to the research. I describe Northern British Columbia and the Food Retail Environments Shaping Health – Intervention Toolkit (FRESH-IT) project, which provided the setting and the platform for this research. This research was conducted over five phases, which I described in detail.

Chapter 5 reports on the intervention planning process with public health practitioners and key stakeholders from the community sector and local government. This chapter outlines contextual features relevant to practitioners. I examine enabling and constraining institutional factors for measuring and acting on retail stores as settings as embedded in community contexts.

Chapter 6 employs functional regions as a spatial unit of analysis that may be useful for examining practice-based observations of regional connectivity and heterogeneity of communities that comprise the region. Functional regions engender contextual considerations which were quantitatively examined in an exploratory analysis of store-level observations on the accessibility and variety of fresh, frozen and canned fruits and vegetables using a standardized tool for retail environment observation.

Chapter 7 reports on qualitative interviews that contextualize environment observation of the consumer food environment within the routine practices and culture of retail stores. This chapter discusses how retail operators manage between global food systems and local contexts in a way that may signal contextual features relevant to intervention planning for small and rural settings.
Chapter 8 is the concluding chapter of this dissertation. I provide a summary of core findings and a discussion of future directions for research and policy in healthy public policy research for smaller cities and rural regions.
1.3 References


2  Theoretical conceptions of context

Healthy public policy is widely recognized as an important framework for improving the environments that shape individual health behaviors (WHO 1986; WHO 1988). Recently, there has been a revived focus on healthy public policy-making through the lens of population health interventions which target physical, economic and social environments (McLaren and McIntyre 2014). In particular, a priority has been to better account for and integrate context into the design, execution and evaluation of population health interventions (Hawe et al. 2011; Shoveller et al. 2016; Craig et al. 2018). In this chapter, I will provide an overview of the conceptual body of public health literature on context that represents the theoretical underpinning for my thesis’ empirical study. In Chapter 3, I will introduce practical applications of Healthy Public Policy in academic research and public health practice to introduce readers to the empirical basis for my research.

The need to understand context is apparent across several sub-fields of public and population health intervention research. This conceptual underpinning has led to distinct contributions in how researchers and practitioners attempt to measure and interpret contextual features that affect health outcomes in unique settings. The framing of this body of work assumes that context holds both theoretical and analytic utility to the examination of healthy public policy development. Context is certainly not new to public health research. The foundations of the ‘new public health’ are rooted in knowing that ‘upstream’ environmental factors can influence individual health (Awefeso 2004; Baum 2016), and several influential social or ecological models of health elaborate the multi-level socio-economic, cultural and environmental conditions that produce health inequalities (Richard, Gauvin and Raine 2011).
In this chapter, I review the multifaceted ways that context has been discussed as it relates to public and population health. The treatment of context varies widely in the literature and depends largely on particular epistemological traditions and perspectives (Edwards and Di Ruggiero 2011). I first review key definitions, and then discuss how context has been addressed in three selected domains: (1) place-based (or geographic) approaches; (2) socio-cultural and economic features of place; and (3) institutional approaches. Each domain is expansive, and sometimes conceptually dense. This chapter is intended to offer a high-level roadmap on theorizing the complex social world where healthy public policies are conceived and enacted.

The broad orientation to context articulated in this chapter was purposely and pragmatically crafted to allow for suitable space to engage with my main aim and research questions. Different paradigmatic approaches to context limit the empirical focus that can be justifiably pursued within a body of scholarship. A pragmatic approach is a pluralistic epistemological stance that is commonly applied in mixed methods research (Creswell and Plano Cark 2011). This position offers an alternative to debates on positivism, post-positivism and constructivism, and holds that phenomena have different layers that can be observed and understood through multiple methods and theoretical lenses (Feilzer 2011). Pragmatists question the dichotomy between an objective and subjective world, and instead aim to produce knowledge best suited to practical, real-world problems (Creswell and Plano Clark 2011). A pragmatic approach therefore provides the flexibility to incorporate the methods and analytic approach of different theorizations of context at different phases of my multi-method design, based on the concepts that emerge through data generation and analysis. That is, I apply *a priori* concepts across a wide body of public health scholarship on context to incorporate how practitioners in this setting account for and integrate contextual features, rather than
being overly prescriptive within one theoretical tradition. It further facilitates the introduction of concepts from cognate disciplines based on thematic analysis of the data.

### 2.1 Defining context

Both ‘context’ and ‘healthy public policy’ have been pursued by public health scholars to signal that environments matter. In the broadest sense, contexts are the physical, social, economic and cultural environments in which people live, work and play (Shiell et al. 2008). In a recent concept review of context in the health sciences, the term was alternately described as:

“…environment, setting, a defined area or location, the work setting, a set of circumstances or unique factors surrounding an implementation effort, or any information that can be used to characterize the situation of an entity. Such entities tend to be organizations, or communities. Setting usually has a narrower focus. It often refers to the place where an intervention is delivered (e.g. primary care setting) or the circumstances for an intervention (e.g. low-income setting)” (p. 106, Pfadenhauer et al. 2015).

Components of context exist within multi-layered, shifting systems that interact with each other, and with external environments (Shiell, Hawe and Gold 2008; Hawe and Potvin 2009; Hawe, Shiell and Riley 2009). From this perspective, context “consists of a constellation of active interacting variables, and is not just a backdrop for implementation” (p3, Damschroder al. 2009).

This complexity is important to consider in approaching population health intervention development. While it is reasonable to know in a theoretical framework that elements and component parts of systems interact, levels and/or units of analysis are arguably required to be discernible for ‘context’ to have analytic utility (McCormack et al. 2009).
The levels of analysis considered in multi-level definitions of context are often ‘located’ in diverse epistemological and ontological traditions. In the remainder of this chapter, I chart the trajectory of how context has been applied in relation to the healthy public policy and population health intervention research focus of this dissertation. I use a framework developed for a Canadian Institutes for Health Research/National Health Service (CIHR/NHS) guidance document on addressing context in population health intervention research (see Craig et al. 2018) as a conceptual and analytic starting point for how I identified the literature reviewed in this chapter. Based on this document, I review three main approaches prominent in the population intervention literature: place-based or geographic features largely rooted in epidemiological description of place; socio-cultural perspectives that examine individual’s relationship to place; and, macro-theoretical views that examine the social, political and economic forces that shape place, as well as the institutional environments where interventions are conceived and enacted. These approaches apply different forms of analysis, and accordingly, produce different types of evidence which demonstrate some of the theoretical and methodological tensions within the science of ‘context’ (Craig et al. 2018).

2.2 A geographic focus on place and context
In the past few decades, the influence of geography in public health has contributed an intention and focus on physical environments within models of context. For example, this literature has produced a vast knowledge base on the role of neighbourhoods and communities for conferring both health assets and liabilities. In the planning and geography literature, accordingly, there has been particular interest in conceptualizing ‘place’ as a reflection of context (Baum 2016; Awofeso 2004). Within public health, this perspective is most apparent within social epidemiology, where extensive analyses have
investigated the potential influence of physical environments on health behaviors and outcomes (MacIntyre and Ellaway 2014).

The role that area of residence plays in driving health outcomes, as well as the differential impacts of interventions, tend to most often be explained by aggregates of individual variables in a geographic location (e.g. socio-economic status, education-level, etc.), as well as by access to health-promoting resources or assets in a geographic area (e.g. amenities, parks, wholesome food stores) (Frohlich, Corin and Potvin 2001; Bernard et al. 2007). The complex interactions between individuals and their environments has led to ‘people and place’ explanations of neighbourhood-level health outcomes. How and why place influences health is a core focus of this work, and public health geography literatures have tended to emphasize either compositional or contextual theorizations of that interface. The compositional explanation attributes the health and place relationship to the shared characteristics of people who aggregate in geographic proximity due to common culture or resources, and who would share similar outcomes despite place of residence. A contextual explanation forwards that the health of individuals depends not only on the aggregated population characteristics of a spatially defined region, but also the physical and social features of spatially defined areas (Barnard et al. 2007).

Explicating compositional and contextual effects is less empirically straightforward or useful than the entrenched debate would imply. MacIntyre and colleagues (2002) outline three challenges to the empirical operationalization of compositional and contextual effects. First, many of the features of populations and localities included in multi-level models are driven by the same underlying social and economic processes; for example, occupations and the local labour market may both be based on access to education within a community. Second, individual factors that are included as controls may not be confounding variables and instead mediate between place and health behaviors. Finally,
few studies theorize the ways that people are shaped by, and in turn shape, their environments. To this end, scholars have advocated for explicit theoretical frameworks to reflect the dialectical relationship between individual agency and place as structure (Veenstra 2005).

While any analysis that situates humans in relation to their broader social, geographic, political and economic environments is ultimately helpful, modeling approaches within this tradition have been criticized for perpetuating a view of context as ‘component parts’ rather than a dynamic system (Poland, Frohlich and Cargo 2008). For example, within this sub-field of public health and related spatial epidemiology, there continues to be a strong orientation towards controlling for, equalizing, and holding constant the “large numbers of variables, variability within them, and the diverse circumstances of public health practice” (p. 6, Green 2006).

Other limitations include an implicit uni-directionality within place and health research, which assumes that places act on individuals, but does not account well for the way individuals and collectivities shape place. In response, more recent research seeks to take a relational view that considers how individuals interact with, move through and restructure the socially constructed physical milieus where they reside.

### 2.3 Socio-cultural and relational approaches

Socio-cultural models take a relational view that considers health-enabling assets within place in relation to people’s ability to mobilize or use those assets (Cummins et al. 2007; Shannon 2014; Clary, Matthews and Kestens 2017). Within a relational view, practices are generated at the intersection of “social structure (norms, resources, policy, institutional practices that organize society) and agency (individual action, volition and sense of identity)” (p. 59, Poland et al. 2006). To understand context is therefore to
elucidate the rules and resources that generate practices and the ways that practices sustain or re-create these rules and resources (Frohlich, Corin and Potvin 2001).

McIntyre, Ellaway and Cummins (2002) add sociocultural dynamics such as “shared norms, traditions, values and interests” (p.130) to the health-relevant resources defined in contextual explanations. In their formulation, five aspects of place establish an ‘opportunity structure’ for health-promoting behaviors: socially determined material or infrastructure resources such as (i) physical features, (ii) healthy environments, and (iii) quality public and private services; and socially oriented criteria such as (iv) the social fabric of a neighbourhood, and (v) that area’s reputation. Still other authors consider outcomes such as “neighbourhood living conditions, community development and employment opportunities, prevailing community norms, customs and processes, social cohesion, civic engagement and collective efficacy” (p. 13, Anderson et al. 2003) as only intermediate outcomes between individuals and neighbourhoods.

Much of the work on socio-cultural explanations is anchored in critical realism, which “privileges neither ‘objective’ factors not subjective lived experience or narrative accounts, but rather seeks to situate both in relation to a theoretical understanding of the generative mechanisms that link them together” (p. 307, Poland, Frohlich and Cargo 2008). A critical realist frame acknowledges that domains of context can be known and measured from traditionally positivist or epidemiological approaches but are shaped by varying discourses and institutions that can be similarly surfaced and critically analyzed (Archer 1995; Guba and Lincoln 2000). Indeed, a central feature of critical realism is to explain various features of social life by revealing the underlying, and often hidden, mechanisms that (re)produce them (Archer 2010). This orientation towards context in place and health research always requires a broader gaze to the macro-structural and institutional forces that influence context itself.
2.4 Macro-structural forces that shape people and place: 

Institutional views on context

Missing from several of the social models discussed above is a focus on the ‘context of the contexts’, or the larger socio-political and economic systems that shape the distribution of and access to resources. As with the focus on the ‘causes of the causes’ in social epidemiology (Marmot 2005; Braveman and Gottlieb 2014), attending to context in population health intervention research invites analysis of how macro relations of power influence targeted populations and places. These power relations are conceived of as distal to, but highly influential in, the decision-making about a specific intervention—as well as the institutional conditions of decision-making and delivery. As some authors note, “taking context into account cannot simply be limited to a description of the intervention beneficiaries, characteristics, the intervention time periods or the intervention location (e.g., school, socioeconomic status of the inhabitants of the residential area or local urban facilities)” (p. 281, Minary et al. 2018). Rather, in this conceptual camp, a deeper theoretical engagement is required with more fundamental questions about how, by whom, and through what rationalities places are governed. Inquiry on context and health in this tradition thus requires an understanding of social actions, processes and structures, which are comprised of a “complex ecology of institutions, actors, rules, values, principles, goals, interests, beliefs, powers and cleavages” (p. 7, Olsen 2006).

Perhaps unsurprisingly, these factors have received considerable attention in public health academic research through the critical sociological analysis of knowledge, power and discourse. Such scholarship would argue that context cannot be understood without interrogating the conditions in which contexts are created, maintained and (re)produced
(Frohlich, Corin, and Potvin 2001; Anderson et al. 2003; Krieger 2008; Shiell, Hawe and Kavanagh 2018). Scholars in this tradition would assess opportunity structures of place, but then further consider that shared ways of acting and relating defined as ‘sociocultural context’ cannot be disentangled from governance of place. In this view, examining governance allows identification of some features of context as ‘problematic’, and distributes area resources in response (Shannon 2014). Here, research on the social action of ‘legitimate’ actors is but one step on the path to reveal wider structures of meaning. That is, the collective orientation of actors generates a variety of social structures, which are ordered by motives, relationships, regularities in action, and hierarchies. Thus, an analytic focus on how public health actors and retailers themselves engage with and operate within a real-world domain such as the food retail landscape is intended to elucidate, for example, the ways in which context is driven by discourses, social hierarchies and institutional relationships around the buying and selling of food.

2.5 Integrative approaches for population health intervention research

As introduced at the outset of Chapter 2, theoretical approaches to domains of context outlined here are not intended to be exhaustive, but together, provide a set of world-views or heuristics for conceptualizing context and the channels through which it shapes and interacts with population-health interventions. In the midst of these, an emerging population health intervention literature considers the dynamic interaction between interventions and the contexts in which they are located. This research considers domains of implementation alongside institutional domains such as the policy, organization and financing of interventions and implementation delivery mechanisms, agents and settings (Pfadenhauer et al. 2016). Rooted in concepts from complexity science and
implementation science, this arguably more pragmatic focus on context and health adopts both conceptual as well as empirical exemplars. It adopts the bi-directionality of some approaches to context and promotes study on (i) how context can either amplify or dissipate intervention effects and (ii) the way in which interventions can (re)produce or transform contexts. My thesis research hews most closely to this approach by applying concepts from across a multi-level view of the settings, contexts and institutions where interventions are introduced.

It is worth noting that complexity science has gained traction to describe population health as well as health services interventions that are defined by interacting components, a range of possible outcomes and variability in the populations or groups targeted, and that are introduced into equally complex systems (Medical Research Council 2008). A systems view theorizes interventions as ‘events’ in complex systems, and

“invites research on how the intervention (a) couples and embeds with context and manifests itself in thinking and practice; (b) changes relationships—patterns of information giving and seeking, support, practical help, role taking, skill use, decision making, collaborating, competing, etc.; (c) displaces existing activities (which may account in part for intervention effect); and (d) redistributes and transforms resources (material, informational, social, cultural) (p. 310, Hawe 2015).

The complex interaction between intervention and context in practical terms is similarly addressed by implementation science, which describes the organizational and institutional factors embedded in both the context and the intervention, but with an emphasis on how health evidence is constructed and taken up. Examples include factors such as a culture of innovation in the organization, degree of prior collaboration among key agencies, and the presence and vitality of champions, as well as funding
opportunities, changes in leadership, organizational constraints and labour management practices (Hawe et al. 2004).

### 2.6 Embedding context in empirical research

As outlined in this chapter, several calls in the literature from a range of epistemological traditions have converged on the notion that population health would benefit from better accounting for and integrating context into the design, execution and evaluation of population health interventions (Hawe et al. 2011; Shoveller et al. 2016; Craig et al. 2018). The recent review by Shoveller et al. (2016) of the empirical treatment of context in the intervention research literature indicated limited breadth and depth of contextual factors, which misses an opportunity to characterize the relationship between context, intervention and outcomes “that can generate impact evidence to inform decisions about intervention investments that are well suited within and across contexts” (p.9, Shoveller et al. 2015). The need to understand context is apparent across several applied sub-fields of population health intervention research, leading to distinct contributions in how researchers and practitioners attempt to measure and interpret contextual features that drive health outcomes in unique settings.

In this chapter, I have provided a brief overview of theoretical developments within the public health literature oriented towards understanding context. These include: (1) contributions from social epidemiology in measuring environmental influences on individual behaviors and outcomes; (2) socio-culturalist and realist methodologies that attempt to ascertain which interventions work, for whom and under what conditions; and (3) pragmatic institutionalist and complexity science approaches including advancements in implementation science that aim to evaluate policy intervention outcomes. I have outlined how my thesis research attends to multiple layers of context, rooted in different
paradigms, in order to interrogate and analyze how practitioners in my study settings understand, account for and integrate context through their applied practice. In the next chapter, I will return to my focus on healthy public policy-making in smaller cities and rural regions, with a particular focus on the setting of retail food environment interventions in Canada’s Provincial North, to explain how the empirical literature on these topics to date has indicated a potential gap worth exploring, in integrating context into population health intervention development.
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3 Healthy public policy in smaller cities and rural regions of British Columbia’s Provincial North: A focus on retail food environments

Healthy public policy is widely recognized as an important framework for improving the environments that shape individual health behaviors. The influence of non-health related public policies was first endorsed in the Lalonde report and formalized in the Ottawa Charter for Health Promotion (Hancock 1986). The Ottawa Charter named supportive healthy public policy as a key condition for healthier people and communities (WHO 1986), a concept further defined in the Adelaide Recommendations as emphasizing health equity, accountability and intersectoral action (WHO 1988; Kickbusch, McCann and Sherbon 2009). A focus on environments provides support for a healthy public policy approach, and raises settings where people live, work and play as important targets for population health interventions (Dooris 2009).

To date, empirical examinations of healthy public policy-making largely focus on large urban centres (Ashton, Grey and Barnard 1986; Marmot et al. 2008). This conveys the idea that Healthy Public Policy, Healthy Cities, and urban health are integrally connected. This resonates with several influential reports that cite growing urbanization—and its economic and political counterpart, globalization—as the major forces in the relationship between demographic change and population health in the 21st century (Hossain, Kawar and El Nahas 2007; Rydin et al. 2012).

Much less attention, however, has been paid to smaller cities and rural and remote regions. While this gap represents a potential oversight in healthy public policy research, it is not surprising. A climate of neglect in rural research has been characterized across several areas of scholarship (Meligrana 2003; Markey, Halseth and Manson 2008; Langille et al. 2009). Addressing this gap is important for improving population health,
as it has been widely observed that rural populations share common health challenges and bear a disproportionate burden of poorer health outcomes compared to their urban counterparts (Pong, DesMeules and Lagacé 2009; Ryan-Nicholls 2014).

Additionally, while understanding effects of urbanization and globalization on health have become central to priority-setting for healthy public policy, and it is often cited that over 80% of the global population is expected to be ‘urban’ by 2050 (UNPD 2018). In Canada, as of the 2016 Census, just 59.6% of the population resides in large population centres of 100,000 and above. Conversely, 12.4% of the population live in small population centres under 30,000 population, while another 18.7% live in rural areas under 1,000 (Government of Canada 2017). The fact that 31.1% of Canadians live in areas populated with less than 30,000 people is, in and of itself, an important stimulus for considering the role of healthy public policy in promoting the health of rural and remote Canadians living in these settings.

Furthermore, while the role of healthy public policies in urban/rural health disparities have been described conceptually, few empirical examples explicitly examine disparities within smaller cities and rural regions, or the relationships between policies and health outcomes in those areas. Although distinct, there is value in considering smaller population centres alongside rural areas, as they share similar services, amenities and systems of governance (Halseth and Ryser 2006). This is the approach which I take in this thesis.

The following chapter provides the background and rationale for a focus on healthy public policy for health-promoting retail environments in small cities and rural regions. I begin by defining healthy public policy. I then proceed to defining smaller cities and rural regions in Canada before describing how healthy public policy for smaller centres
and rural regions presents a research gap and how the applied setting of food retail environments offers an opportunity to bolster research in this area.

3.1 Healthy public policy

3.1.1 Defining a healthy public policy approach

Healthy public policy aims to create supportive environments that enable people to lead healthy lives by putting health on the policy agenda of all sectors, at all levels (WHO 1986). The concept of building healthy public policy was first introduced in the Ottawa Charter for Health Promotion in 1986 and affirmed a new way of thinking about health and well-being. Further progress on the core tenants of healthy public policy were advanced in Adelaide, Australia, at the Second International Conference on Health Promotion (WHO 1988). The core tenants of healthy public policy include “a broad definition of health, a goal to reduce health inequities and intersectoral collaboration to influence the policy cycle from inception” (p. 178, Chircop, Bassett and Taylor 2015).

This population-focused approach acts on the physical and social contexts that shape health through action across non-health sectors. More recently, Health in All Policies (HiAP) has been named as a formal mechanism or structure for governments to evaluate the health impacts of policies or programs (Freiler et al. 2013) Public policy is defined here as the formal laws and rules enacted by elected officials, but also the whole set of decisions, norms and behaviors initiated by public authorities (Brownson, Seiler and Eyler 2010; Bernier and Clavier 2011).

In this thesis, I often use healthy public policy and population health interventions interchangeably. Population health interventions are defined as “policies, programs and resource distribution approaches that impact numerous people by changing the underlying conditions of risk and reducing health inequities” (Canadian Institute for
Health Research 2017). Such initiatives are often delivered through area or settings-based initiatives to improve physical, social and economic environments. The alignment between healthy public policy and population health interventions can thus be considered as two-fold. Within the broader framework of healthy public policy, population health interventions are one approach to operationalizing healthy public policy-making through public health practice. However, in turn, healthy public policies can also create enabling structural environments for implementing population health interventions.

Population health interventions can be classified according to the groups they target, and the extent to which they address individual behaviors or more structural determinants. These classifications are useful for considering the relationship between population health interventions, and healthy public policies. Frohlich and Potvin (2006) make the distinction between three different approaches to population health interventions. The populations at risk approach is aimed at targeting populations with high-levels of risk behaviors, or particular exposure to vulnerability. Population approaches aim to alter whole-of-population-level norms and behaviors to achieve broad reductions in risk exposure. Other authors further distinguish the population approach by predominantly radical or structural strategies that reform the context or circumstance of a behavior, as opposed to predominantly superficial strategies that rely on individual agency and aptitude (McLaren and McIntyre 2014). A vulnerable population approach targets the shared economic and social conditions that put some groups ‘at risk of risks’ (e.g. Indigenous status, income lower than the poverty threshold, or those who have not completed post-secondary education).
3.1.2 Healthy public policy and the urban health agenda

Healthy public policy has been on the agenda of governments in Canada and elsewhere for decades (Hancock 1986). The growth of the health and place literature described in Chapter 2 has bolstered the evidence base for healthy public policy action through a program of research that identify how features of the environment contribute to health, and the degree to which they are modifiable (Galea, Freudenberg and Vlahov 2005). Within this literature, the idea of ‘healthy public policy’ often invokes the idea of ‘urban health’. As illustrative examples, the influential ‘Commission on the Social Determinants of Health’ consider action on the social determinants of health as a core imperative for an increasingly urban global population (Marmot, Friel, Bell et al. 2008). Within the urban health agenda, healthy public policy has invoked a broad set of actions on social, physical and economic environments. The quality of social and physical environments can confer benefits to health, but can also be detrimental to well-being (Vlahov et al. 2007; UN Habitat 2012). Proximity to social networks and health care structures (Vlahov et al. 2004), walkable and transit-oriented infrastructure that promotes physical activity and improves air quality and resilience to climate change (Youngeret al. 2008) and food environments that promote healthy eating (Lake and Townsend 2006) offer an urban health advantage. Conversely, cities are faced with numerous threats to health, such as: violence and crime; congestion; injury; lack of infrastructure to promote physical activity and healthy eating; rapidly rising rates of chronic disease; and, environmental challenges such as climate change (UNHabitat 2012).

Local governments are often positioned at the vanguard of establishing the necessary conditions for health (Hancock 1993). Indeed, healthy public policy found an ‘exemplar expression’ in the Healthy Cities (and Communities) movement, which was formalized in the mid-1980’s and established a governance framework and administrative structures
to embed healthy public policy-making at the local level (Norris and Pittman 2000). The healthy cities movement strived to foster and coordinate action on a broad set of areas such as workplaces, housing, recreation, and cultural norms of behavior and lifestyle (Hancock 1986; Petersen 1996; Kickbusch 1999). In Canada, the legacy of these actions are evident in recent investments by the Canadian Institutes of Health Research to fund research that implements and evaluates population health interventions to promote healthier cities (CIHR 2018).

### 3.2 Healthy public policy in smaller cities and rural regions: An empirical gap

Although there are numerous examples of applied healthy public policy-making, few have been implemented in smaller cities and rural regions. As discussed in Section 3.1.2, an urban view is at the foundation of the ideas, institutions and actors implicated in the ‘healthy cities’ movement, and more recently in population health interventions. A lack of discussion or examples specific to smaller cities and rural regions in healthy public policy theory and applied practice suggests that rural places may be overlooked or perhaps not even considered as relevant to healthy public policy implementation (White 2013). Nevertheless, other overlapping areas of research can piece together a clearer picture. Collectively, these literature sources can help consolidate our understanding of the state of healthy public policy research for non-urban settings.

Many researchers have studied the relationship between rural residence and health, with a focus on the social determinants of health in non-urban centres, often expressed as demographic variables (Bryant and Joseph 2001; Leipert and Reutter 2005; Wanless, Mitchell, and Wister 2010). Several studies have shown that individuals residing in rural and remote areas have lower life expectancy, and a greater prevalence of physical impairment and chronic illness such as diabetes and arthritis (Pong, DesMeules, and
Lagacé 2009; Romanow 2012). There also seems to be a relationship between the extent of rurality and health, where higher degrees of rurality and remoteness tend to lead to greater the health disadvantages (Pong, DesMeules, and Lagacé 2009). Moreover, rural residents are also more likely to be disadvantaged across a range of social determinants of health, including lower levels of income, lower educational attainment, and more hazardous occupational classes and work conditions (St John et al. 2002). A smaller number of studies describe population health intervention planning in smaller cities and rural regions (Raine et al. 2010; Nykiforuk et al. 2013), and best practices in relation to rural health interventions (White 2013).

Contributions from rural and regional studies offer a broader picture on social and economic conditions that healthy public policies seek to ameliorate. The delivery of social, health, education and infrastructure services have been in significant decline since the economic crises of the 1980s and the rise of neoliberal policies of privatization and state retrenchment (Hanlon and Halseth 2005; Markey, Halseth and Mason 2008; Halseth and Ryser 2016). Smaller cities and rural areas are especially vulnerable to restructuring of state services. These regions are often difficult to service due to vast distances between communities and low population density. At the same time, “these services provide a crucial foundation for day-to-day activities and for maintaining local quality of life and the local economic base” (p. 70, Halseth and Ryser 2006). For some, the closure of local services (re)produces the population changes used to rationalize these actions and leads to inevitable decline of rural areas in an era of globalization and increasing urbanization (Markey, Halseth and Mason 2008).

Canadian rural scholars have discussed how globalization and decreased regulation led to closures and amalgamation in Canada’s resource economy, which is the main driver of economic development in many smaller cities and rural regions across Canada’s
provincial north (Halseth, Markey and Bruce 2009). In rural areas, compounded pressure from fewer jobs and fewer services has been one driver of declining populations alongside the linked forces of aging and youth outmigration (Hanlon and Halseth 2005). These temporal changes are relevant for healthy public policy planning. Healthy public policy is premised on local-level policy implementation and program delivery. In addition, healthy public policy requires capacity for inter-sectoral collaboration between state and non-state actors in smaller population centres and rural areas.

3.3 Smaller cities and rural regions in Canada

3.3.1 Defining smaller population centres and rural areas

The Statistics Canada Population Centre and Rural Area Classification provides a standard, quantitative set of definitions to classify the Canadian population. Until 2011, populations were classified as ‘urban’ and ‘rural.’ The urban-rural dichotomy has been widely applied and is intuitively understood. In reality, urban-rural exists on a more dynamic continuum, so in 2010, Statistics Canada replaced urban areas with population centres (POPCTRs), which were divided into three types (small, medium, and large) based on the size of their populations (Statistics Canada 2017a). These definitions can be broadly applied for research since the new standard typically aligns with administrative planning boundaries. Using these definitions, as of the 2016 Census, 59.6% of the Canadian population resides in large urban population centres of 100,000 and over; 9% live in medium population centres between 30,000 and 99,000; and 12.7% of the population live in small population centres between 1,000 and 29,999 (Statistics Canada 2017b). In the 2016 census, 18.7% of the population lived in rural centres of fewer than 1,000.
In addition to the population centre/rural area typology, Statistics Canada classifies the extent of metropolitan influence in rural areas as a relative measure of rurality (Rambeau and Todd 2000). All census subdivisions not classified as census metropolitan areas (CMAs) or census subdivision (CAs) are classified into strong, moderate, weak or no metropolitan influence (MIZ). These categories are determined according to commuting flows, where areas with stronger influence have a greater proportion of employed labour force commuting to any CMA/CA urban core (Rambeau and Todd 2000). In the 2011 Census, of the 18.9% of the population living in rural areas, 5.8% live in areas with strong metropolitan influence, 6.9% in areas with moderate metropolitan influence, 3.9% in areas with weak metropolitan influence, and 0.7% live in areas with no metropolitan influence. The remaining 0.2% of rural residents live in Canada’s northern territories (Statistics Canada 2017c).

3.3.2 Smaller cities and rural regions in Canada’s ‘Provincial North’

Many of Canada’s smaller cities and rural regions are located in Canada’s ‘Provincial North’. Considered the ‘North below the North’, the Provincial North is a significant proportion of Canada’s total land mass, and sits ‘in between’—geographically, and often economically, socially, politically, and culturally—the dense population band along the southern west to east border with the United States, and the circumpolar North (Coates and Poelzer 2013).

Provincial northern regions have been theorized as “encompass[ing] a vast expanse of Canada that shares northern climates, political marginalization, large Aboriginal populations, a substantial dependence on resources economies, and Arctic and sub-Arctic landscapes” (p.2, Coates and Poelzer 2013). They are distinguished by significant geographic heterogeneity and face distinct challenges and opportunities. Scholars have advocated that similarities between Provincial North’s, and the connectedness within
regions, make them a useful scale for policy-making (Weller 1984). Hence, the ‘provincial north’ typifies a geographic region where understanding the unique circumstances for smaller population centres and rural areas in shaping health is paramount. They provide a fruitful geographic focus for examining gaps in healthy public policy and population health intervention development.

3.4 Food environments: An applied setting for population interventions

Food environments have been identified as promising targets for healthy public policy intervention (Lake and Townshend 2006; Swinburn et al. 2011; Allender et al. 2012; Sacks, Swinburn and Lawrence 2008). Notably, environmental and policy-level solutions to promote healthier environments are often described interchangeably as ‘healthy public policy’ and ‘population health interventions’ within this literature. This acknowledges that most of the policy levers that shape food access and disparities typically fall outside explicit health sector control. The food system is also complex and includes both local and global dynamics. Accordingly, healthy public policy at the local, national and internationally can improve the availability, accessibility and adequacy of healthier foods in retail environments.

Many factors influence what people eat, from global trade policy, to the information available in the settings where people shop. There is increasing consensus across disciplines that the global food system produces overlapping health, social, economic and environmental risks, which require collective (i.e. policy) action to mitigate (Lang and Heasman 2004). It is well-accepted that action is required across sectors and scales of the food system is required to promote healthier population diets. For example, the
NOURISHING framework outlines policy targets within the food system, food environment and information environment (Hawkes, Jewell and Allen 2013). In this theory of change, the food environment is a central mediator in the recursive, dialectical relationship between the food system and eating behaviors.

3.4.1 Defining retail food environments

Glanz and colleague’s (2005) model of food environments and how they affect health has been most widely applied in the literature (Minaker 2016). The model identifies four components of food environments: community nutrition environment, consumer nutrition environment, organization nutrition environment, and the information environment. The term retail food environment usually encompasses both community and consumer nutrition environment features. Community nutrition environments, or the geographic distribution of number and types of food sources, and the consumer nutrition environment, or availability, quality and promotion of foods within stores or restaurants, are identified as the highest priority for research and intervention. In this model, environmental variables shape eating patterns through individual-level demographic and psychosocial factors, or perceptions of the nutrition environment (Glanz 2005).

3.4.2 Conceptualizing retail food environments

There is a large evidence base on retail food environments in the United States and United Kingdom. Much research has documented the spatial patterning of retail stores, reporting on the number type and size of stores according to area-level characteristics (Black, Moon and Baird 2014). The focus of this research was largely oriented towards the concept of ‘food deserts’, a term which has been used to define areas where access to healthy foods is limited (Walker, Keane and Burke 2010). Within the ‘food desert’ discourse, different stores types were equated as being more or less healthy, with
supermarkets framed as affordable sources for healthier foods (Shannon 2014). A more recent strand of research has evolved from studies of geographic access aimed at assessing the availability, cost and quality of food using measures in store (Gustafson, Hankins and Jilcott 2012; Lytle and Sokol 2017). Studies of community and consumer availability often examine where spatial disparities in food access intersect with economic and social deprivation, exemplifying a geographic approach to context in shaping population health.

There is growing consensus that retail food environments are an important determinant of dietary behaviors and health outcomes (Black, Moon and Baird 2014), however answers on the nature of the associations have not been satisfactorily addressed (Minaker et al. 2016). One argument is that a spatial focus may not capture the interplay between individuals, communities and environments (Cummins et al. 2007). In this socio-cultural and relational construction of place, individual, household –and to a lesser extent neighbourhood—characteristics may mediate or moderate the influence of retail environments (Clary, Matthews and Kestens 2016). Fewer studies have examined these factors, which are important for understanding the complexities of retail environments (Fleischhacker et al. 2011; Gustafson et al. 2012). In studies that address socio-cultural factors, over- or under-correcting for social-cultural factors as potential confounders may diminish or overestimate the significance of associations (Giskes et al. 2011).

3.4.3 Non-urban retail environments: An empirical gap

There is limited empirical evidence that characterizes the retail food environment in rural and remote areas in Canada (Minaker et al. 2016), or international examples from which reasonable comparisons may be drawn (Pinard et al. 2016). The gap is especially apparent for research that uses valid, reliable measures to characterize the food
environment, or that measure associations between retail environments and health outcomes (Fuller, Engler-Stringer and Muhajarine 2016). There is consensus that Northern retail environments differ from southern and urban locations, but the specific nature of those differences is not known (Minaker et al. 2016; Burnett et al. 2017). Differences may be relevant across geographic and socio-cultural explanations of retail food environment influences on individual behaviors and health outcomes, which bear attention in retail intervention planning.

In this chapter, I outlined two empirical areas that are relevant to understanding context: healthy public policy-making and retail food environments. I make a case for the public health significance of examining areas of research in smaller cities and rural regions, which are home to a significant proportion of Canada’s population and experience poorer health outcomes. In Chapter 4, I describe the setting and methods that I used to examine this topic.
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4 Overall methodology

This chapter provides an account of how I conceptualized, planned and implemented my research. I begin by providing a background on Northern British Columbia (BC), where I conducted this research. I then situate my project in the methodological traditions of community partnered research and interpretive approaches, and reflexively locate how this project is rooted in my experiences bridging public health research and practice in the fields of community health and social policy. The final section of this chapter describes the methods I applied throughout the research, organized by phase and data sources. This chapter is intended to provide an overview of the design and methodology to complement additional details on specific components that have been tailored to each of the manuscript chapters that follow (Chapters 5, 6, and 7).

4.1 Study setting

4.1.1 Northern BC

The northern region of British Columbia can be defined by the administrative boundaries of Northern Health (NH), the regional health authority that services the northern two thirds of British Columbia’s land mass (Figure 1). It is a geographically diverse region, encompassing coastal areas, mountainous regions within the Coast, and Rocky Mountain Ranges, boreal forests on the Interior Plateau and prairie environments within BC’s Northeast region. The estimated population for the area is just under 300,000, or 7% of British Columbia’s total population. Within the administrative boundaries, Prince George is the largest city by population with just under 80,000 people. Smaller cities range from 1,000 to 30,000 people, while rural areas include settlements of less than 1,000 people. The number of communities within the region is reported variably in the published and
grey literature. In a 2008 publication with similar boundaries to the NH administrative region, researchers denoted 34 municipalities and 62 Aboriginal First Nations (Markey, Halseth and Manson 2008). NH identifies 32 municipalities, 54 First Nations and 127 unincorporated communities. This discrepancy can be explained by the lack of data available for some communities, which may exclude them from some research. For many of these designated localities, publicly-accessible Statistics Canada data is only available for the corresponding Census Subdivision (CSD), which hampers the ability to classify smaller localities (for example, according to population size) for research purposes. Over the course of this research, I was unable to obtain a comprehensive list of communities and their demographic characteristics. In many ways, this is emblematic of the methodological issues of collecting data in such a region. These methodological challenges are discussed in Section 4.3.1.1.
Figure 4.1. Northern Health Administrative Region

Source: Northern Health Region
Outside of shared administrative boundaries, this region, one of Canada’s ‘Provincial Norths’, is affected by shared social, economic, and political forces. As one observer has explained, “this ‘space’ may be called a region to the extent that it exhibits common patterns of historical development and present-day socio-economic characteristics” (p.412, Markey et al. 2008). The northern region has played a vital role in resource development in British Columbia and has fueled economic prosperity for the rest of the province. A rich resource base of forestry, mining, power generation and natural gas development were the main drivers of economic growth in the 1960’s and 70’s, when the region went through a period of rapid economic and community growth (Baxter, Berlin, and Ramlo 2005). This period was relatively short-lived and reflects broader economic and demographic change elsewhere in Canada. Since the early 1980s, population swings and a general downward economic trend has been the norm, due in part to globalization and commodity fluctuations which significantly restructured the resource industry (Markey et al. 2008).

The share of BC’s population living in rural areas declined from 14.6% to 12.4% between 2001 and 2011. When considered in terms of metropolitan influence (or the extent to which a population commutes to an urban core), in BC, rural populations in zones of weaker metropolitan influence declined, while those of moderate and no metropolitan influence increased, following trends elsewhere of a ‘suburbanization’ on the outer edge of metropolitan areas (Moazzami 2014). The largest population growth rate in the province has been in Indigenous communities, where on-reserve populations have grown by 12.7% and off reserve populations by 46% between 2001 and 2011 (Moazzami 2014).

While resource industries drive much of the province’s economy, some scholars have noted that the geographic removal of extractive industries from centres of population and
political power in the region have externalized the north as a ‘resource bank’ for infrastructure and service spending within larger metropolitan regions elsewhere in BC. Conversely, declining resource revenues have led to withdrawal of many federal and provincial government services in northern communities, including post offices, employment insurance offices, and health and education services, reflecting broader processes of state retrenchment (Markey, Halseth and Manson 2008). This has been influential in generating political marginalization and exceptional circumstances in the region (Coates and Polzer 2013).

Residents in Northern BC experience poorer health than the provincial average and over 80% of the population report at least one or more risk factors (i.e. low physical activity, poor diet, and current smoking) for chronic illness (Allison 2016). Cancer and chronic disease are the most common diseases making up the disproportionate burden of illness in the Northern Region. While Northern British Columbia fares poorly compared to metropolitan (i.e. Southern) areas of BC, outcomes are similar to other communities located elsewhere in the Canadian Provincial North that face similar social, health and economic conditions (Allison 2016).

NH is one of five regionalized public health services authorities in BC. NH administers and delivers a full range of population health and health care services to a group of largely rural and remote communities. This includes acute care, long term care, and community health services and programs. The region is organized into three Health Service Delivery Areas (HSDAs): the Northeast, the Northwest, and the Northern Interior (see Figure 4.1). Each HSDA is led by a Chief Operating Officer, who has overall responsibility for the operations of the HSDA. Each HSDA also has a Medical Health Officer responsible for population and public health services. NH has an organizational presence across the region, and is a central convener and enabler of
4.2 Methodology

4.2.1 Community-university partnerships for applied public health policy research

I adopted a community partnered approach to research for this doctoral thesis, in collaboration with NH. NH was one of three sites across Canada invited to participate in a Canadian Institutes of Health Research (CIHR) funded knowledge-to-action project to accelerate the development of evidence-informed, testable, local population health interventions in Canada that improve access to healthier foods in the food retail environment. The BC Food Retail Environments Shaping Health—Intervention Toolkit (FRESH-IT) project was co-led by myself, as a doctoral researcher, and the Chief Population Health Dietitian for NH. I spent two years (2016-2018) embedded in this partnership, which also included a steering committee that included NH’s food security and local governments leads.

The implementation of the FRESH-IT project formed the platform for my thesis research. I used FRESH-IT as an applied example of intervention planning to layer and investigate questions on how practitioners account for and integrate contextual considerations relevant to delivering services in a small and rural setting. The additional support provided through my role as a doctoral researcher provided significant additional capacity to NH to conduct FRESH-IT planning activities, including retail food environment measurement and data analysis. Accordingly, I fostered and managed the relationship with the health region, designed a retail food environment measurement plan based on planning meetings with project partners, and collected and analyzed...
quantitative and qualitative data. NH staff provided strategic guidance to align the project with NH’s organizational priorities, brokered internal and external relationships, and contributed to the design of the project. The terms of reference for this arrangement are included in Appendix 1. While the support provided through my role as a doctoral researcher was integral to project delivery and was ultimately a strength of the research design, the dual management of project implementation and attention to my research questions also posed several challenges, which are addressed in Section 4.3.1.3.

Community partnered approaches to research arose in response to a well-publicized ‘knowledge to action’ gap between research and the realities of community practice (Northridge 2003). A variety of terms have been used to describe these partnerships, such as ‘community-university partnerships’, ‘action research’, and ‘integrated knowledge translation’. Rather than a single definition, community partnered approaches can be considered as a research paradigm with a set of shared principles. These include reciprocal transfer of knowledge and expertise, shared decision-making and co-ownership of data and knowledge products (Wells et al. 2006). A growing body of literature indicates that despite challenges, these collaborations can provide a mutually beneficial means for addressing a broad set of community, health and environmental challenges.

The ascendency of community partnered approaches to research has been a response, in part, to known gaps in uptake of research evidence in policy and practice. The underlying premise is that the traditional cycle of research and dissemination activities have largely been insufficient, if not altogether prohibitive to promoting practical evidence uptake. Conversely, a community-university partnership assumes as its starting point that stakeholder involvement in all phases of the research is needed to lead research with real-world applicability, and more effective uptake of academic research in community
settings (Wells et al. 2006). In this model, researchers benefit from questions derived from policy and practice problems and a more nuanced understanding of the contextual circumstances where change may occur. Practitioners may benefit from the ability to reflect on their practice and the opportunities to iteratively adapt programs and policies based on emergent findings of the research (Gagliardi et al. 2016). A recent commentary by Brown et al. (2018) reinforces the utility of partnered research for grounding research methods in the ‘gritty realities’ of policy-making, while reinforcing evidence-informed policy within government agencies.

A community-university partnership is well-suited to the focus of this project on interrogating context in healthy public policy development, and to the organizational environment of NH. Healthy public policy interventions require buy-in from government agencies, community-based organizations and business enterprises who are responsible for advocating for, or implementing, policy and program change. Stakeholder engagement can also facilitate the sustainability of an intervention beyond the initial research (Mendel et al. 2008). Additionally, for stakeholders in small and rural jurisdictions, research collaborations may provide opportunities to gather evidence for which research capacity does not otherwise exist, and to broker cross-sectoral relationships that strengthen or expand on existing organizational foci (Langille et al. 2009).

4.2.2 Interpretive policy approaches for understanding practice

A community partnered approach is closely aligned with an interpretive approach to my research methodology. Through the partnership, I was situated in an embedded role to co-produce, co-document, and co-analyze the conditions that enable healthy public policy planning. Interpretive policy approaches aim to gain a fuller understanding of the
overall capacity for policy change by bringing to light the lived experiences, concrete decision-making, and practices of policy actors (Yanow 2000).

For interpretive scholars, observing practice is at the centre of understanding how problems are defined and what solutions are proposed to public policy challenges (Yanow 2000). As Hajer (2003) explains, this means that practices are a valuable part of the analytic toolkit for understanding a policy process. When practitioners act upon a problem, a practice viewpoint would suggest that they are actively interpreting, framing, and negotiating their position within changing institutional and social systems in a process of deliberation and adaptation. In other words, the practices within a policy context can be explored to observe the enabling conditions for healthy public policy development. In applying interpretive methods to the exploratory, sequential design, I will describe what domains of context are identified by practitioners, but also how and why (or, the mechanisms) by which context is integrated and accounted for in the practice of food retail environment assessment and intervention design.

4.2.3 Reflexively locating myself in applied research and practice

Reflexive practice has increasingly been applied in public health research to account for the presence and influence of the researcher across the research process (Finlay 2002; Dowling 2006). Reflexivity may be especially important to community-engaged research, where the researcher may hold dual roles in project implementation, while also documenting the process and analyzing outcomes (Greene 2014). Here, I use two main types of reflexivity to locate myself in this research: I will discuss my subjectivity as a researcher and practitioner through ‘personal reflexivity’ and ‘epistemological reflexivity’ (Dowling 2006).

Personal reflexivity is a critical engagement with the cumulative experiences, interest, values and beliefs that shape the researcher’s subjectivity within the research process.
Prior to my graduate studies in public health, I worked for 10 years in a variety of urban community health settings. This work continued during my graduate training, where I accepted several contracts with community health and environmental organizations. Midway through my doctoral degree, I took a one year leave to pursue a senior policy role in social development at the City of Toronto. The culmination of this experience and my identity as a public health practitioner were instrumental to the way I carried out this research. Observing how research evidence is mobilized into program and policy development informed my commitment to co-design applied research project with public health practitioners and to taking an active role in project implementation.

Epistemological reflexivity is a broader view that refers to the research endeavor as a form of socially-located knowledge production (Dowling 2006). This approach centers the researcher’s involvement in the research process, and invites the researcher to interrogate and address the assumptions upon which the research question(s) and method(s) of data collection and analysis are chosen and applied (Dowling 2006). The assumptions include ontological, epistemological and theoretical ones that guide the research. Over the course of my graduate training, I received extensive training in critical social science perspectives in public health research and practice (Eakin et al. 1996). Sociological theory provided a theoretical toolkit that I had not received in my previous training. I was especially drawn to post-structural critiques of public health practice, which provided a set of concepts to reflect upon, and make sense of, my practice-based experiences. More specifically, these theories offered an introduction to how inequalities are (re)produced through individual approaches to promoting health that are shaped by neoliberal rationalities of responsible citizenship.

Over the course of the project, several tensions surfaced in the active negotiation of my personal position as a practitioner and my epistemological stance as a researcher. These
tensions can be understood through the concept of ‘praxis’, or the process of applying theory through practice (Nelson et al. 2004), and are discussed at length in accounts of qualitative ‘insider’ research (Van Heugten 2004; Greene 2014). Insider research refers to studies that are conducted within cultures, organizations or social groups where the researcher is also a member, or where the researcher plays multiple and simultaneous roles in the research (Greene 2014). Navigating applied or ‘insider’ research can be complex. For example, in this study, NH had limited capacity to develop projects outside of the scope of work that is directed by regional and provincial mandates, or outside of practices that become routinized through organizational ‘path dependency’ (Liverani, Hawkins and Parkhurst 2013). This meant that the co-leadership role I held in this community-based partnership was as a highly active and responsive facilitator of the work, with health region partners taking on a steering committee role. The implication was that my role was simultaneously as facilitator, participant and observer during participant observation of routine planning meetings and during dialogic workshops. This posed several methodological challenges—and opportunities—which I will discuss in relation to the study methods, described below.

4.3 Methods

I carried out five main phases of research related to the FRESH-IT project between May 2016 and September 2018. A stepwise, phased approach was employed to align with the research question, which was purposefully conceptual, as well as the empirical community-based partnership context, so that contextual features could be unearthed and incorporated into a retail food environment assessment as they emerged through healthy public policy planning activities with the project partners. All study protocols received ethical approval by the University of Toronto Research Ethics board in March 2017.

The five phases of work are as follows:
• Phase 1: Participant observation with public health practitioners;

• Phase 2: workshops with public health practitioners using case vignettes to design a locally-relevant assessment plan;

• Phase 3: assessment of availability, quality and price in a sub-region within the Northern Health administrative boundaries;

• Phase 4: interviews with key informants to reflect on the planning process; and,

• Phase 5: in-depth, semi-structured interviews with retail operators.

The phases reflect distinct yet overlapping purposes. Data collection activities with practitioners (phases 1, 2 and 4) were intended to surface what features of context matter for practitioners, and how context is accounted for and integrated into planning (RQ1). I report on the results of this activities in Chapters 5 and 6. Data collection on the retail food environment (phases 2, 3 and 4) was aimed to apply contextual features relevant to healthy public policy-making into retail environment assessment (RQ2). I report on the results of these activities in Chapters 6 and 7.

While each phase informed subsequent data collection, not all results are reported in the results of this thesis. Phase 3 generated significant data that was key for FRESH-IT implementation and informed responses to my research questions on how practitioners account for and integrate context, but not all results could be reported within the scope of this thesis. Specifically, I do not report on Geographic Information System (GIS) mapping of all retail stores, or conduct full statistical analysis on availability, price and quality measures, which went beyond the main aims of my focus on context. With Phase 3 data, analysis of a smaller number of product categories was conducted to examine practitioner hypotheses related to context, and to animate the concept of a functional
The research phases and use of the data in thesis and knowledge user products is presented in Figure 4.2.

Figure 4.2. Community-University Partnership, Project Design

<table>
<thead>
<tr>
<th>Phases &amp; Data</th>
<th>Thesis results</th>
<th>Knowledge user Products*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ch. 5</td>
<td>Ch. 6</td>
</tr>
<tr>
<td>1 Participant observation of planning meetings (28 meetings in 24 months)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2 Dialogic workshops (3 workshops)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>3 Environmental observation of the retail food environment (41 stores)</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>4 Interviews with public health (PH): PH practitioners, government reps, not-for-profits (5 PH informants)</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>5 Interviews with retail store operators (8 retail informants)</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

*Completed activities with knowledge users are indicated in darker boxes, while ongoing activities are indicated in lighter boxes.
4.3.1 Phases 1, 2 and 4: Practitioner participant observation, dialogic workshops and key informant interviews

4.3.1.1 Data sources

Project meetings were held between May 2016 and September 2018. I conducted participant observation during planning and dissemination meetings with the project lead and project steering committee. A total of 28 meetings were held over the course of the project. Data sources I used from these meetings included text meeting agendas and meeting minutes. I maintained field notes and a reflexive journal to systematize observations from project implementation. Field notes recorded the date and time of the event, the setting and the participants involved. Notes included descriptive observations about project planning decisions, as well as interpretive observations on the implementation process and context. Meeting minutes and planning documents were labelled to correspond with field note observations for identification during the analysis.

Additionally, I conducted participant observation during three half-day workshops in June 2016. Dialogic workshops were convened for FRESH-IT implementation and provided an opportunity for additional participant observation during the planning process. Snowball sampling was used to invite public health professionals from across the NH (N= 12). Participants held frontline, subject matter lead, and management roles in population and public health. They were also diverse in the population groups they served, and in the area of public health practice that they represented.

Participants were asked questions in relation to two case vignettes on food retail environment assessment and intervention planning. Case vignettes for my research were adapted from drafts developed by the FRESH-IT project team, in order to integrate contextual features that were raised during steering committee meetings. Vignettes are
short stories based on hypothetical scenarios in which respondents are asked to draw upon their personal and professional experience to predict how characters will or should behave (Mah et al. 2014). For example, participants were prompted to consider what factors should be considered in retail environment assessment, what tools and approaches should be used to collect data, and how assessment evidence could be framed to present a strong rationale for action. The facilitation guide for these sessions in included in Appendix 2. Participants provided informed consent prior to participating in project activities (Appendix 3). The sessions were audio-recorded and supplemented by session documents (e.g. flip chart responses) and my detailed field notes. Summary notes on the recordings were developed with ‘targeted transcription’ of quotes that were relevant to the study aim.

The final component of data collection for these phases was a series of in-depth, qualitative interviews I conducted with key informants from public health, local government, and the community sector (N=5) between May and September 2018. The interview guide is included in Appendix 4. A convenience sample was selected to triangulate KI interview findings with data from researcher-facilitated participant observation. Interviews followed a semi-structured format, with prompts for specific events, projects or partnerships that had been raised during meetings and workshops. With written consent, interviews were audio-recorded and transcribed verbatim.

4.3.1.2 Analysis

Data analysis involved four commonly applied steps in qualitative research: ‘immersion in the data, coding, creating categories and the identification of themes’ (Green, Willis, Hughes et al. 2007). Consistent with interpretive research, my analysis involved moving back and forth between these steps to test and refine concepts as new data were generated.
(Schwartz-Shea and Yanow 2012). I conducted all data collection and led all analysis. To immerse myself in the data, all meeting minutes, workshop transcripts, field notes and interviews were revisited and read on multiple occasions at strategic points in this study. Observations were recorded in analytic memos that were shared with manuscript co-authors (i.e. my committee members) who deliberated upon concepts with me and contributed to refining the themes. Workshop and interview transcripts were transferred into qualitative data analysis software (*Dedoose version 8.0.44*) to organize and code the data. Data were coded deductively based on core concepts in context literature outlined in Chapter 2, and then further inductively analyzed using open coding strategies. Analytic categories were created to identify patterns and organize categories in the data. The focus of inductive analysis was to identify patterns as they relate domains of context relevant to healthy public policy development.

Methodological rigour was ensured through several strategies. The project was collaboratively designed by myself as the FRESH-IT northern BC project co-lead, alongside the NH co-lead and steering committee across four phases of data collection and analysis. Observations and lessons learned from the previous phase were incorporated into applied research questions and data collection methods for subsequent phases of the project. This iterative development was a form of ‘member checking’ (Birt et al. 2013). In member checking, data or results are provided to participants to ensure an accurate portrayal of their responses and experiences. In this case, methodological decisions made by the NH core team for Phases 2 to 4 of the research validated that contextual features addressed in the retail food environment assessment were resonant with practitioner experiences. Rigour was also ensured through my reflexive journaling on the research process and writing analytic memos to maintain an audit trail and to interrogate my reflexive positioning in the research (Drisko 1997).
4.3.1.3 Strengths and limitations

My position as an ‘outsider-insider’ with the NH team offered several benefits to the successful execution of my research. My shared role in project implementation and familiarity with the ‘institution’ of public health conferred access, entry and a common ground from which to begin the research (Dwyer and Buckle 2009; Greene 2014). A strength of insider research is the opportunity for researchers to use their familiarity with the subject matter or institutional setting as a tool in study design and analysis (van Heugten 2004). Being immersed in the institutional dynamics was critical to the conceptual basis of defining and collecting data in a ‘functional region’, a core methodological decision in this research, and ultimately, a central dimension of how context was conceived of and operationalized in healthy public policy-making in this region.

The rationale for conducting key informant interviews with some of the same individuals was to formalize reflection on these decisions, and to elicit another form of data to triangulate with my field notes and my participant observations during the two-year partnership. Reviewing the data I gathered, I found that much of the richness that emerged during less formal data collection procedures were not fully captured in quotations from key informant interviews. This is likely due to my familiarity with interviewee-collaborators, and assumed shared meanings which were not raised or elaborated in the interviews. This is a common pitfall of insider qualitative research, particularly when interviewing professionals or ‘elites’ who assume that the researcher is familiar with the phenomena under study (Delaney 2007; Greene 2014).
4.3.2 Phase 3: Retail food environment assessment

4.3.2.1 Data sources

A comprehensive dataset of retail food premises in NH was obtained from NH’s Environmental Health team in September 2017. The administrative dataset included all licenced food facilities in the health region as of April 2017. Out of a total of N=1,656 facilities, N=1,280 were classified as restaurants and N=376 were classified as food stores. Duplicates were identified and re-classified according to the primary purpose of the retail premise. Two reviewers applied the exclusion criteria (Table 1) to the remaining facilities.

Table 1. Inclusion and exclusion Criteria for retail food stores

<table>
<thead>
<tr>
<th>Store type</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurants</td>
<td>Primary purpose of the destination is recreational (e.g. bowling alley, theatre, sports arena concession)</td>
</tr>
<tr>
<td></td>
<td>Private or member only establishment (e.g. golf club)</td>
</tr>
<tr>
<td></td>
<td>Service provider or facility that prepares food for residents, clients, or students (e.g. schools, nursing homes)</td>
</tr>
<tr>
<td></td>
<td>Requires pre-order (e.g. caterers)</td>
</tr>
<tr>
<td></td>
<td>Lodgings without a publicly available restaurant</td>
</tr>
<tr>
<td>Food Stores</td>
<td>Concession or small store ‘at private establishment (e.g. campground)</td>
</tr>
<tr>
<td></td>
<td>Very limited number of food items, such as candy/chips at check-out</td>
</tr>
<tr>
<td></td>
<td>Membership-only store</td>
</tr>
</tbody>
</table>

After the inventory was cleaned and verified a total of N=710 restaurants and N=307 food stores were geocoded. They were also coded by business type according to the
North American Industry Classification System (NAICS), a comprehensive system that provides standard definitions for all economic activities carried out in Canada, Mexico and the United States. NAICS codes included: grocery stores (445110), discount stores (452112), convenience stores (445120), limited service eating places, i.e., take-out or fast food (722512) and full-service restaurants (722511). Meat markets, fish markets and natural food markets were classified as specialty food stores (4452). Pharmacies with grocery items were classified as grocery stores. Snack and non-alcoholic beverage bars (i.e. coffee shops with baked goods) were classified as limited-service eating places. Food stores (i.e. grocery stores, discount stores, convenience stores and specialty food stores) were further coded by business type: independent vs. chain/franchise (provincial and national). Stores were classified as chains if they had 5 or more locations provincially or nationally.

A sub-area within the Northwest Health Service Delivery Area of the NH administrative region was prioritized by public health practitioners (see Figure 1 above). In the NH Environmental Health Database, there were 44 stores listed within the sub-area. During data collection, I completed ground-truthing of premises which resulted in the removal of eight stores from the sample, and the addition of five more stores. Three stores had closed their businesses and another five stores included a highly-limited selection of food items (i.e. chips, sugar-sweetened beverages and candy at till), so both sets were removed. One store was added as convenience store, two as grocery stores, and two as discount stores. The final sample included N=41 stores.

An adapted version of the Nutrition Environment Measures Survey (NEMS - S) was based on a blended tool suitable for both store and convenience contexts developed for assessing the retail environment in the Avalon Peninsula, Newfoundland (Appendix 8). Further adaptations were made through a collaborative, multi-stakeholder process to: 1)
ensure culturally-appropriateness of items, 2) align with other methods for food environment assessment in British Columbia, and 3) capture key dimensions of choice that may engender unique shopping behaviors in rural and remote communities (for example, travel for access to reference and private label brands). The adapted NEMS-S-NH instrument measured the availability, quality and price for 80 items in 15 sections of measures. Implementing the tool required approximately 45 minutes to complete an assessment of a full-size supermarket or large rural general store, and approximately 15-25 minutes for a small rural corner store. Retail operators were provided with an information letter prior to data collection (Appendix 7).

4.3.2.2 Analysis

Descriptive statistics were used to summarize the proportion of each of the food items available across all stores. There was limited availability of fresh, frozen or canned FV in convenience stores, or in stores classified as ‘other.’ Therefore, statistical tests of inference were only applied to grocery stores and supermarkets. Chi-square tests were conducted on availability and variety for grocery stores and supermarkets. Due to the small number of observations for some items, Fisher’s Exact test was also used. All analyses were carried out using SPSS (Version 1.0.0.1072).

4.3.2.3 Strengths and limitations

Ground-truthing premises within the larger dataset and conducting in-store assessment of availability, price and quality responds to calls in the literature for more precise measurement of retail environments and is a significant strength of this research. I encountered several challenges in actualizing the community (i.e. GIS) and consumer (i.e. in-store environment) retail food environment assessment that was initially planned in collaboration with NH partners. In Chapter 5, I treat a lack of available data sources,
issues with primary data collection and lack of capacity to conduct statistical analysis as findings of my research. I outline them here to highlight some of the difficulties of conducting retail environment research in a geographically large, sparsely populated region.

First, the categories that were applied to categorize all stores in the region and the stores where in-store measures were collected may not reflect the significant diversity in the types of stores common to Northern communities. A more ‘objective’ variable such as number of cash registers, square footage, or total number of Stock Keeping Units (SKUs) may be more useful for grouping ‘like’ stores, however significant capacity would be required to gather this information given the geographic size of the entire NH region.

Next, I had limited access to the types of geographic or demographic data that are typically used to examine differences in retail store access. There was no consistent list of all communities within the NH administrative boundaries at the time of this research. Additionally, demographic factors such as socio-economic status and age, and geographic variables such as remoteness, were only available at the CSD level. Often, large CSD’s comprise many small communities. This impacted my ability to produce maps to determine proportions of the population with more or less access to different types of retail stores, and to determine a geographic or demographic patterning of differences. Finally, accessing a Statistics Canada data center may have responded to some of these concerns, but was not feasible or sustainable for the health authority’s continued leadership of the project, nor was the quantitative assessment the main focus of my methodological design.
4.3.3 Phase 5: Qualitative interviews with retail operators

4.3.3.1 Data sources

In this phase of the research, I conducted in-depth, semi-structured interviews retail operators (N=7) between April and May 2018. Store owners and managers were purposively selected based on running a small-or medium-sized supermarket or convenience store and selling at least one item in 50% of NEMS categories. I focussed on independently-owned small- and medium-sized stores because of the unique challenges these retailers face providing access to more nutritious foods, and their importance to food access in under-serviced or rural areas (Pinard et al. 2016; Laska et al. 2018). Storeowners and managers were contacted by phone or e-mail. The interview guide consisted of questions and follow-up probes in the following content related categories: store owner or manager background; business operations; opportunities and challenges of operating in the broader retail environment; opportunities and challenges posed by the store location; and, indicators of store success (see Appendix 5). The interview guide encouraged flexibility and allowed participants to describe experiences and share stories that were relevant to them.

I conducted the interviews in-person at a location convenient for participants. Interviews lasted between 45 minutes and 120 minutes. Informed consent and permission to audio-record the interview was gained prior to starting the interview (see Appendix 6). Detailed summaries were written following each interview that described the store setting, and provided an overview of the storeowner background, store history and noteworthy business practices and strategies. The summaries were used to explore emerging themes in subsequent interviews.
4.3.3.2 Analysis

Interviews were digitally recorded and transcribed verbatim in Microsoft Word. I used a generic thematic analysis to analyze the data (Braun and Clarke 2006). Using this approach, I began by reading all interview transcripts and case summaries to gain a better understanding of the ideas and concepts in the data. Analytic memos recorded common patterns, paying attention to sensitizing concepts that were used to develop the interview guide. I then drew out concepts from the data during open coding. In other words, rather than using a purely inductive approach that began with open coding and proceeded to conceptualization, analysis followed a deductive then inductive approach. The process generated codes that were entered into Dedoose (version 8.0.42), a computer software qualitative data management program to code all the data and facilitate analysis. Given the aims of my analyses, I specifically considered codes on business operations, retail practices, and the broader retail and regional context.

4.3.4 Strengths and limitations

There were several limitations to the qualitative interviews conducted with retail operators. While the small sample size was appropriate to the retail food environment intervention planning process in which this study was embedded, it limits my ability to generalize within the broader northern region where the public health partner in this research delivers services, as well as to other small and rural settings. Several of the retail operators who agreed to participate had expressed an interest during environmental observation of the retail environment carried out during Phase 3, which may mean that those who participated differ from those who refused, or who did not follow up on interview requests. However, I did not intend to generalize perspectives, but rather gain a
deeper and contextually situated understanding of contextual features in the region where intervention planning was focussed.
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5 Enabling conditions for healthy public policy in smaller cities and rural regions: A study of intervention planning for healthier retail food environments

This paper is unpublished and unsubmitted work written in manuscript style. The target journal for this paper is Social Science and Medicine.

Authorship list: Hasdell, R., Poland, B. and Cole, D.C.C., and Mah, C.L.

Declaration: R.H. devised the project and main conceptual ideas, led the research partnership, collected data, performed data analysis and interpretation and drafted the manuscript. C.L.M. contributed to project design and provided comments on the analysis and manuscript and multiple stages of writing. C.L.M, B.P. and D.C.C. supervised the project, discussed the results and provided comments on the manuscript.
5.1 Introduction

Healthy public policy is a foundational public health strategy to promote healthier communities (WHO 1986; WHO 1988). Healthy public policies target the spatial, social, economic and political environments that shape health and well-being. In many urban settings, public health officials and researchers have promoted action in non-health sectors to foster enabling environments for health, and, in response to increasing global urbanization, cities have been at the forefront of this work (WHO 2008; Corburn 2009; Rydin et al. 2012). Globally, a growing body of literature has emphasized the role of so-called ‘upstream’ actions of local jurisdictions to promote health and well-being (Lake and Townshend 2006; Story et al. 2008). In the Canadian context, few empirical examples exist for smaller cities and rural regions (Minaker et al. 2016).

Smaller cities and rural regions offer a unique opportunity to examine healthy public policy development. Much has been written about demographic, socio-cultural, political and economic differences between urban centres and small cities and rural regions (Coates and Polzer 2013). However, explicit consideration of where these differences may enable or constrain healthy public policy development allows researchers to address evidence gaps around how policy is made and implemented, and how interventions may be more effectively tailored to local conditions. There is a strong public health rationale for examining these questions in smaller cities and rural regions. Rural communities bear a disproportionate burden of chronic disease in the Canadian context (Pong, DesMeules, and Lagacé 2009; Ryan-Nicholls 2014). In Canada, 12.4% of the population live in small population centres between 1,000 and 30,000, while another 18.7% live in rural areas under 1,000, which are often proximate to smaller-sized cities (Government of Canada 2017). Some research addresses determinants of rural health status (Smith, Humphreys
and Wilson 2008; White 2013), but the contribution of healthy public policy in explaining these differences has received limited attention in the public health literature.

Food environments are one setting where ‘upstream’ healthy public policies can influence consumer decision-making and the selection of healthier dietary choices, or even transform environmental conditions such as access and affordability of healthy and nutritious food (Swinburn, Egger, and Raza 1999; Sacks, Swinburn, and Lawrence 2008; Shill et al. 2012; Swinburn et al. 2013). As with healthy public policy, most food environment interventions have been delivered in larger urban centres where more is known about the retail food environment (Mah et al. 2017). Limited evidence suggests that rural environments in Canada have poorer availability and access to healthier food environments, although this research is limited in scope (Minaker et al. 2016). The confluence of a lack of locally-relevant evidence, unique contextual conditions and limited organizational capacity to act on food environments may be contributing factors to the lack of robust descriptions from smaller and rural settings.

This paper investigates healthy public policy development through an applied case of retail food environment intervention planning within a regional health authority in British Columbia, Canada. The aim of this study was to explore what features of the local context enable healthy public policy for retail food environments in smaller cities and rural regions. Specifically, we examine: (1) how context is accounted for and integrated in healthy public policy planning by public health practitioners (2) what features of local context are relevant to developing healthy public policies, and (3) what evidence about food retail environments do public health professionals require to take action within local contexts? To address these questions, we specifically address the ‘policy practices’ of public health professionals engaged in intervention planning processes, thereby
responding to identified gaps in understanding key ingredients for healthy public policy development in smaller cities and rural regions.

5.2 Background

5.2.1 Bridging two streams of research in Healthy Public Policy research

Evidence gaps are apparent within two general domains of healthy public policy research. First, there have been calls for empirical research on the enabling conditions for healthy public policy development. Concepts and methods from political and policy sciences for examining levers of influence within the diverse sectors and systems that influence health and the determinants of health are particularly important to this discussion (Bernier and Clavier 2011). Second, there is limited engagement with the local and regional contexts where policies are introduced. Variable local contexts may impact on the implementation process of interventions, and on associated behavioural or health outcomes (Edwards and Di Ruggiero 2011; Fuller and Potvin 2012; Shoveller et al. 2016; Craig et al. 2018). These gaps are in separate literatures, however there is a strong rationale for addressing them in tandem. The ‘practice’ of policy development is an important part of how and why interventions may achieve their desired impacts. In addition, practice provides one way of surfacing and making sense of the contextual conditions relevant to an intervention.

5.2.2 Healthy public policy in Canada’s small cities and rural settings

Smaller cities and rural areas are noteworthy for their absence in discussions of healthy public policy development, or population interventions more broadly. Limited research
discusses development or implementation of interventions in these settings. Notable exceptions include research on food and nutrition and physical activity interventions in small and rural Alberta communities (Raine et al. 2010; Nykiforuk et al. 2013; Nykiforuk et al. 2017), built environment planning in rural Nova Scotia (Howell 2013), and retail food environments in Newfoundland and Labrador (Mah et al. 2017).

Research evidence from urban planning and political sciences inform a broader view of this gap. Urban theorists note that a small number of ‘global’ or metropolitan cities conjure a narrow set of ‘processes, practices, actors, spaces and places’ for healthy public policy interventions (Jayne et al. 2010). This is to say that the way that healthy public policy is theorized, quantified and applied may privilege major metropolitan services and unintentionally marginalize smaller cities and rural regions. This is an inherent risk in the application of healthy public policy derived in urban settings; what holds true for smaller cities and rural regions may be qualitatively different in the approach to intervention planning, development and implementation. Similar observations have been made in the field of rural and regional studies (Polèse and Shearmur 2006; Reimer 2006; Markey, Halseth and Manson 2008; Langille et al. 2009). Smaller Canadian cities and rural regions have seen the closure of several government agency offices in the past 30 years, resulting in fewer directly accessible services at the local level. Some authors go as far as to argue that rural Canada is declining in the face of complex, inter-related processes of neoliberal restructuring of state services and declining rural populations (Hanlon and Halseth 2005; Reimer 2006). This is relevant for healthy public policy making. Service cuts in non-health sectors impact the ability to make changes in policy domains that are relevant to a healthy public policy approach. Less local service delivery—and specifically, the presence of other allied government agencies within a community or
region—also impacts the potential to partner and collaborate with municipal and community actors at the local level, which is an identified enabler for healthy public policy development (Milio 1987; Allender et al. 2012).

5.2.3 Healthy public policies for retail settings

Retail stores are a major influence on household food purchasing. Canadian households spend 72 cents of every household food dollar in retail stores (Statistics Canada 2014). It is well-known that unhealthy diets are a contributor to chronic conditions such as diabetes, hypertension, and cancers, and can contribute to reduced overall quality of life (Ng et al. 2014). Promoting healthy public policies in retail food settings is therefore an important task for improving population health outcomes (Mah et al. 2016).

Healthy public policies for retail settings include interventions to address the accessibility, availability and the information environment within stores, as well supportive policies in other sectors that impact retail settings (Story et al. 2008). A wide range of policy options have been described across socio-ecological levels and at different scales of governance. However, local policy relevance may be more important for public health professionals tasked with promoting healthier cities and communities (Allender et al. 2012). Interventions at the local level can be characterized as addressing the availability of healthier food outlets, the accessibility of nutritious options in store and the information available to consumers (Glanz et al. 2005). For example, land-use planning, zoning and licensing instruments can improve proximity to, or density of, healthier food outlets, while program activities in store may target the price, promotion and placement of healthier and less healthy foods (Mah et al. 2016). Public policies on social determinants distal to retail settings impact on the feasibility or effectiveness of accessibility, availability and information environment interventions. For example,
public policies to improve income security may provide a more enabling environment to improve a community’s retail food infrastructure (Dachner and Tarasuk 2018).

5.3 Methods

5.3.1 Study setting

This research was conducted as part of the Food Retail Environments Shaping Health – Intervention Toolkit (FRESH-IT). FRESH-IT is a knowledge to action project to accelerate the development of locally-relevant solutions to improve retail food environments in smaller, rural and remote jurisdictions. Implementation of the FRESH-IT project in British Columbia was conducted in partnership with Northern Health (NH)—one of five regionalized public health service delivery regions of the province. NH was one of three FRESH-IT implementation partners across Canada invited to implement a Health Canada/Public Health Agency of Canada toolkit to measure, act on and evaluate retail food environments (Health Canada 2013). A two-year partnership was carried out in 2016-2018 between the lead author of this paper (RH), the Chief Population Health Dietician for NH, and a steering committee that included NH’s food security and local governments leads. Ethics approval for the research was obtained from the University of Toronto Research Ethics Board in March 2017.

NH delivers all health services for the northern two-thirds (or 600,000 square kilometers) of British Columbia. The region serves approximately 300,000 people in a mix of small and medium population centres, rural and remote areas, and Indigenous communities. Residents in Northern BC experience poorer health than the provincial average and over 80% of the population report at least one or more risk factors (i.e. inadequate physical activity, poor diet and smoking) for chronic illness. Cancer and chronic disease are the
most common conditions making up the disproportionate burden of illness in the NH region (Northern Health 2015).

5.3.2 Methodology

The project was guided by principles of university-community partnered research (Wells et al. 2006), which aims to ensure that research addresses practitioner-identified problems, and supports ongoing integration of research evidence into applied practice. This paper specifically reports on planning activities with public health professionals, and key informant interviews with the public health, local government and community-based sectors. The primary author of this study (RH) co-led project delivery and documented the process of designing and delivering a retail food environment assessment as part of FRESH-IT intervention planning.

Methods to elicit and ‘make visible’ often taken-for-granted or implicit meanings and practices are particularly useful to address the goals of this study. Practitioners have an experiential knowledge that is applied in the everyday practice of public health. However, underlying practice embodies an understanding of the ‘physical, cultural, social, economic and political realities of their communities’ (Nykiforuk et al. 2017). This knowledge is generated through professionals’ practice and the experience of living in communities. Indeed, practitioners are often impacted by policies in the communities where the work (Mittelmark 2001).

Interpretive methods are one method for examining the practice of policy-making. Two interpretive methods informed data collection for this research. These included Interpretive Description (ID) (Thorne, Kirkham and O’Flynn-Magee 2004) and Interpretive Policy Analysis (IPA) (Yanow 2000). Interpretive methods focus on
‘practice’ as a way of understanding how problems are defined and what solutions are proposed to public policy challenges (Yanow 2000). ID has mainly been used in clinical settings to address complex experiential questions of applied practice (Thorne, Kirkham, and O’Flynn-Magee 2004). IPA applies similar techniques as ID to policy problems and examines how meaning making occurs within policy relevant publics. In both cases, the understanding of a problem is inseparable from the institutional knowledge, structures and relationships which are inter-subjectively constructed through social interaction and situated in relations of power (Wagenaar 2011).

5.3.3 Data collection

Participant observation, workshop reports and key informant interviews were the primary data generated and analyzed for this paper.

5.3.3.1 Participant observation

Data included various project documents such as planning documents and meeting minutes from project implementation with the project co-lead and steering committee between May 2016 and September 2018. Meetings were held either bi-weekly or monthly over the duration of the project. Field notes and a reflexive journal were maintained during project design, data collection and analysis. Field notes recorded the date and time of the event, the setting and the participants. Notes included descriptive observations of project planning decisions, as well as analytic observations on how practitioners identified and negotiated contextual considerations in the planning process. Meeting minutes and planning documents were labelled to correspond with field note observations for identification during analysis.
5.3.3.2 Dialogic workshops

Three half-day workshops were held in June 2016. Snowball sampling was used to invite public health professionals (N= 12). Participants held frontline, subject-matter lead and management roles within NH. Participants represented different population groups and areas of public health practice.

Participants were asked questions about two case vignettes on food retail environment assessment and intervention planning. Vignettes are short stories based on hypothetical scenarios in which respondents are asked to draw upon their personal and professional experience to predict how characters will or should behave (Mah et al. 2014). For example, participants were prompted to consider what factors should be considered in retail environment assessment, what tools and approaches should be used to collect data, and how information could be framed to present a strong rationale for action. Case vignettes were adapted from the Health Canada/Public Health Agency of Canada toolkit (Health Canada 2013) by the British Columbia case project team to integrate contextual features that were raised during steering committee meetings. The sessions were audio-recorded and supplemented by session documents (e.g. flip chart responses) and detailed field notes. Summary notes were developed with targeted transcription of quotes relevant to this study’s aim.

5.3.3.3 Key informant interviews

Semi-structured qualitative interviews were conducted with key informants from public health, local government and the community sector (N=5) in May 2018. A purposive sample was selected to triangulate with participant observation and workshop results. Interviews followed a semi-structured format, with prompts for specific events, projects.
or partnerships that had been raised during meetings and workshops. With consent, interviews were audio-recorded and transcribed verbatim.

5.3.3.4 Analysis

Data were analyzed using thematic analysis (Braun and Clarke 2006). Data analysis involved commonly applied steps in qualitative research: immersion in the data, code generation, category creation and the identification of themes (Green et al. 2007). Consistent with interpretive research, analysis involved moving back and forth between these steps to test and refine concepts as new data were collected and results analyzed. The primary author of this study (RH) collected all data and conducted all analysis. Data immersion consisted of multiple readings of meeting minutes, workshop transcripts, field notes and interviews. Observations were recorded in analytic memos that were shared with the study’s co-authors (BP, CM and DC). Workshop and interview transcripts were imported into qualitative data analysis software (*Dedoose version 8.0.44*) to organize and code the data. Data were coded deductively based on broad domains of context from a CIHR/NHS guidance document on addressing context in population intervention research (Craig et al. 2018), which formed the rationale for this study. Analytic categories were created to identify patterns and organize categories in the data. Inductive coding identified specific features within the broad domains, with a focus on identifying patterns as they relate to organizational measures of healthy public policy development. Participant quotes were anonymized for reporting of results. In this paper, responses from workshops are indicated with the code ‘WK’, and interviews are denoted with the code ‘I’.

Methodological rigour was ensured through several strategies. The project was collaboratively designed by the primary author (RH), project co-lead and steering
committee across four phases of data collection and analysis. Observations and lessons learned from the previous phase were incorporated into research questions and data collection methods for subsequent phases of the project. This iterative development was a form of ‘member checking’ (Birt et al. 2016). Rigour was also ensured through a reflexive journal on the research process maintained by the lead author, and by writing analytic memos to maintain an audit trail (Drisko 1997).

5.4 Results

5.4.1 Local contexts for healthy public policy development

Practitioners identified a long list of contextual factors relevant to the planning process across socio-demographic, spatial or geographic, socio-cultural, economic and institutional domains (Table 5.1). The most salient factors that informed decision-making and planning were areas where those features intersected with institutional considerations, such as the geographic size of the region, and how the contextual factors identified by practitioners might be heterogeneous across the different communities that comprise the region.
### Table 5.1 Domains and features of retail store settings and local contexts relevant to healthy public policy planning

<table>
<thead>
<tr>
<th>Domains of context</th>
<th>Features of context</th>
</tr>
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</table>
|Epidemiological (individual and area-level socio-demographic features)| Car ownership  
Income  
Age  
Access to credit  
Social assistance rates  
Vulnerability indices (e.g. Human Early Learning Partnership)  
Community health indicators  
Population density|
|Geographic/Environmental (physical and built environments)| Ownership type of retail food businesses in a community  
Food storage infrastructure (e.g. refrigeration)  
Local agricultural production  
Regional interconnectedness  
Transit infrastructure  
Transport networks (e.g. road access)  
Degree of remoteness|
|Social, economic and cultural| Food sharing norms  
Informal stores  
Traditional food practices  
Sense of scarcity  
Expectation of travel|
|Services and organizational (institutional)| Community interest or readiness  
Service coverage of regionally-administered Provincial and/or national programs (e.g. Canadian Perinatal Nutrition Program)  
Staff and capital resources of health region  
Staff and capital resources of community organizations  
Emergency (e.g. food banks) and community (e.g. community gardens) food programs  
Cost of Eating in BC|
|Political/historical| Colonization  
Traditional land practices  
Economic cycles (i.e. ‘boom or bust’ economies)|
|External shocks and catalytic events| Impact on road access from environmental events (e.g. flooding or fires)|
5.4.1.1 Geographic size of the region

In Northern British Columbia, health services are delivered regionally in a geographically large, dispersed area. The regional health authority delivers a full range of health services, including primary care and public health. The region is further subdivided into three Health Service Delivery Areas (HSDA’s) that are responsible for service delivery within discrete community clusters. Within public health portfolios such as Population Health Nutrition, subject matter leads provide policy support for the entire region. The size of the region—“the whole region is very large, the size of France”, Workshop 2—was frequently invoked in deliberations on how policy solutions to promote more health-enabling retail environments might be delivered at the local level.

Participants were involved in a continuum of policy actions and programs to address food security. These included addressing immediate needs through emergency food programs such as food banks and soup kitchens, building community capacity in community gardens and kitchens, and systems redesign through food policy councils, or regional and provincial food networks. Food insecurity issues also overlapped with service areas such as school health, maternal and child health and healthy communities. Working across these different leverage points within the food environment to improve food security within a large region was often noted to be a challenge. As one participant stated:

“Yeah, the food security continuum plus the geographical size, it’s a lot”. I-09

5.4.1.2 Spatial and socio-cultural differences between communities

The scale of the region meant that there was significant heterogeneity within and between communities that comprise the region. As one participant noted:
“So you do have small cities, you do have towns, you do have regional districts, you have places that might only have like three or five or twenty residents that are unincorporated, and so – And these are spread out over huge distances. You can travel highways where nobody lives” 1-10

Accordingly, participants across direct service delivery and regional policy roles raised the need to tailor their work to ensure that policies and programs address unique community needs:

“Of course, ... you can’t generalize one area to the other. There’s people in all different areas that prioritize but it’s, you know, from across Northern B.C. perspective you know it’s different communities require or need sort of different interventions I would say. So that’s a big challenge that I think about a lot anyway, and I think about my role and how I can help sort of address that” 1-09

For participants who occupy regional roles, community differences can raise tensions for policy and program development. This is especially apparent when those differences are related to the socio-cultural, political and economic features that comprise a place. One participant provided the specific example of protecting land for food, while also considering the economic importance of resource industries that impact the natural environment:

“... different things are happening you know and where some are sort of dependent on the resource industry and some are dependent kind of on the land and so it’s, there’s conflicting, maybe conflicting is not the right word but there would be different priorities within each community, so to have an overarching food security strategy would kind of whitewash, which is not the intention. The
5.4.2 Institutional responses to local context

Participants responded to features of local context through several strategies that account for and integrate community differences in the delivery of local services. These were achieved through internal and external partnerships and community-development approaches that bridge regional policy and mandates and the delivery of programs and policies at the local level.

5.4.2.1 Partnerships

Internal and external partnerships were one strategy that participants identified for designing and delivering programs at the individual, community and systems-level, and across geographic scales. Indeed, partnerships were discussed as a main strategy for driving a community-level agenda to improve food security and access:

“That is the challenge with this type of work: when you are serving several communities, you need stakeholders in the community to guide the work” WK03

“You need that engagement and buy-in, starting at your core group, and then from there looking at a needs assessment however large that is, looking at who your stakeholders are, city council, the health authority, social service agencies, because food security impacts all of these others groups” WK-02

An effective partnership approach builds on and leverages existing activities and leadership in communities. For healthy public policy development, government or organizational policy can provide a leverage point for locally-relevant action.
“Within their community and a lot of them do have, they do speak to food security in some way within these Official Community Plans and so I think rather, like it’s hard to have one overarching policy or one overarching strategy because Northern Health is very vast and every area of it has entirely different priorities and so I think it’s hard to say one specific policy, but I think working with individual communities with the local government, with the municipality, that’s kind of the first step in sort of a larger picture” 1-09

5.4.2.2 Community-development approaches

Partnerships were also highlighted to be important in developing community-development approaches that were seen to directly respond to the kinds of local issues and contextual nuance that practitioners consider as part of local contexts. The types of issues that matter to communities were discussed as a critical starting point to healthy public policy development.

“‘The first thing that comes to mind is ‘do with, not to’. You have to ensure that the problems and solutions have been defined with the community, and not just afterwards’” WK-01

“‘but it’s kind of this loop, right, because we’re hearing form people what’s important, and then we’re trying to make it into policy, and then we’re trying to act on it’” 1-08

5.4.3 Evidence, knowledge and framing

In many areas of public health practice, public health professionals and allied actors develop a program rationale through local-level partnerships and collaboration. Their work with local actors are also a form of evidence on the appropriateness of a policy or
program within the culture, structure and practices of a specific setting (e.g. school) and in the broader community. At the time of this study, participants described limited partnerships or collaborations with food retail operators to act as an entry point to understand how the features of local contexts (outlined above) play out in communities.

5.4.3.1 Situating retail environment data ‘in context’

Participants identified the need for qualitative and quantitative measurement of retail environments, such as proximity, density and the availability, price and quality of foods in stores. However, these factors alone may not explain the purchasing or health outcomes that are targeted through retail interventions.

“it’s not cut and dried, or it’s not always intuitive, sort of, you know what influences people’s perception of the system, or people’s use of the system. And how complex that is to tease out, and how that complexity adds to the challenge in terms of thinking about initiatives that might support improvements within the retail food environment.” I-10

For participants to apply this information to healthy public policy decision-making, they identified that evidence should be interpreted through the practices, culture and structures in retail settings and local communities. For example, participants raised that people’s experience with retail food environments might be influenced by demographic characteristics such as SES, age, and single parent status. Retail availability and accessibility might also be understood in relation to the full list of factors described in Table 5.1. These factors are less so a checklist than an indication that local contexts matter and are a consideration in program and policy development. For example, one participant shared the following in relation to economic factors:
“It was like, how do you work in a community on food security when people are like super transient and there's not like a reliable market for your farm or whatever it is that you want to do, so it just kind of made me think about things a little bit differently not from the perfect world perspective but from this very complicated social world” I-01

Participants expressed uncertainty about how features of local communities that are available through routine monitoring of demographic factors (e.g. census data) and in the delivery and evaluation of existing programs may impact retail environments. Retail operators were not identified as a current partner for participants — “But in terms of day to day conversations related directly to food security, no, not often”, I-08. At the same time, participants described the perspectives of retailers as a crucial component of intervention planning.

“I think you know if any store managers were willing to be interviewed, they know exactly what they sell and what they don’t sell. And just that, those conversations in themselves can be quite revealing. I know I did a project 7 or 8, maybe 10 years ago now on improving vending machines. And I worked closely with a man from the vending company, and he could tell me exactly what was going to sell, what wasn’t going to sell. Let’s not forget to engage retailers as well.” WK-03

5.5 Discussion

This paper set out to examine the enabling conditions for healthy public policy development in smaller cities and rural regions, using a case example in a region of northern British Columbia. Our results align with literature elsewhere that identifies inter-sectoral partnerships and evidence as key ingredients to developing and implementing policy interventions (Raine et al. 2012). We extend this view by arguing
that the way practitioners develop partnerships and gather evidence is a response to context, which forms another piece of the healthy public policy puzzle. Policy practices are one part of the analytic toolkit for examining professional agency within and in relation to social systems and structure. The results indicate that the strategies practitioners employ to respond to local contexts are important to the practice of healthy public policy development.

Practitioners in this study identified and acted on population health concerns across a large geographic region. It is useful to speak briefly to the scale of this task. The Provincial North consists of the upper two thirds of several Canadian provinces, where populations are distributed across vast areas with low population density. In most Canadian Provinces, health services are delivered at this scale (Church and Barker 1998). Contributions from regional and rural studies have characterized several commonalities across Northern regions, which include northern climates, a higher proportion of Indigenous populations and resource dependent economies (Coates and Poelzer 2013). The commonalities speak to the ways that Northern communities are often distinguished from their Southern counterparts. In the rural health literature, the distinction between large urban southern cities and smaller Northern cities and rural regions is an organizing narrative for considering health differences in northern populations. For example, it is not uncommon for studies to report on the risk factors for chronic conditions and health outcomes according to rural/urban status (Mitura and Bollman 2003; Pong, Desmeules and Lagace 2009). However, practitioners who both live and work in Northern communities raise the importance of the differences that exist between and within the small cities and rural regions where they work. The way that practitioners identify and grapple with differences in localized contexts in the intervention planning process is a particularly salient finding of this study.
The idea that interventions are introduced into settings which are embedded in complex local contexts has begun to receive more attention in the literature. A broad understanding of context considers demographic, spatial, socio-cultural, economic and political features, as well as the resources, culture and capacities within the targeted setting or within the implementing organization (Craig et al. 2018). Several frameworks take up the interplay of these features and the planning, delivery and evaluation of interventions. Examples include the settings approach (Poland, Krupa and McCall 2009) and systems modelling (El-Sayed et al. 2012). More recently, a guidance document from the Medical Research Council/Canadian Institute for Health Research seeks to integrate components from these models into a comprehensive approach (Craig et al. 2018)

However, the kinds of frameworks and evidence described above can only be meaningful when thoughtfully deployed by practitioners who deem them relevant to their local or regional context(s). Several methods were employed in this study to elicit the types of evidence required by public health practitioners to support healthier retail environments. Retail food environment measures were considered as necessary but not sufficient for decision-making. Practitioners in this study deliberated on how contextual features may explain potential differences in retail food environment accessibility and availability and may impact the effectiveness of different interventions in the retail setting. Some of the individual-level considerations raised in these results are available for some communities in profiles that report on demographics, health outcomes and service usage at the local level. Much of what was described by practitioners indicated a much more complex and difficult to quantify dialectic between the routine practices, culture and structure that differ between the communities within the region.

It is this more complex view described by practitioners in this study that reflects recent calls to better integrate and account for contextual considerations in population health
research. In light of modest or uneven population-level trials, leaders in the field have raised the importance of measuring and accounting for how context interacts with intervention design, implementation and outcomes (Poland, Frohlich and Cargo 2008; Edwards and Di Ruggiero 2011; Craig et al. 2008). Despite wide agreement on the importance of context, there remain few published empirical examples that apply these theoretical concepts (Shoveller et al. 2016). Where context is considered, it is often treated as problem to be factored in or out of statistical models (Shiell, Hawe and Kavanagh 2018). The results from this study indicate that practitioners engage in the types of adjustments required to tailor interventions to context. At the same time, there is a need to better operationalize the features practitioners describe into empirical studies. A small but growing number of studies theorize contextual factors as mediators and moderators in conceptual models and utilize causal modelling to examine the interaction between the two (Craig et al. 2018). Methodological developments that are grounded in and responsive to practice-based observations would assist those working in the field to understand whether, and to what extent, certain aspects of context matter. This approach has been described in a few community-university partnerships that bring together theoretical, empirical and practice understandings of context in population health intervention research (Raine et al. 2010; Nykiforuk et al. 2013, Nykiforuk et al. 2018).

Our findings indicate that quantifying and analyzing complex, and often implicit, contextual considerations can be a daunting task for research and policy planning. Recent scholarship points to complexity and systems thinking for engaging with messy realities of interventions and the settings where they are introduced (Hawe, Shiell and Riley 2009). Systems thinking proponents assert that ecological thinking requires attention not simply to the multiple levels or layers of context, but also to their adaptive, dynamic and non-linear interactions (Norman 2009). Interactions among individual components of a system (or context) can merge together to create new and distinct elements that go
beyond the properties of any one individual factor (Hawe, Shiell and Riley 2009). Adequately taking complex systems into account requires new timelines and processes for policy-making that may be misaligned with research and government timelines, but have the potential to produce more enduring impacts (Eppel, Matheson and Walton 2011).

Despite the complexity of context, practitioners in this study describe how community development approaches could be employed to tailor policies and programs to local contexts, and that these strategies are applied in areas of practice to ensure the relevance of existing actions to community-identified concerns. These results confirm findings in the healthy public policy literature on the importance of collaboration and community participation for developing healthy public policies (Javanparast et al. 2018). The application of community-development principles into policy-making that supports communities to identify their concerns, and to plan and implement responses, can contribute to policy processes that are empowering or ‘health-promoting’ (Lindstron and Eriksson 2009). Indeed, “if community building principles are taken seriously, policymaking itself may become a process of community building, with community members engaged at every step, from framing the issues to interpreting the data, discussing the options, and working for the adoption of the policy change they wish to see” (p.372, Blackwell et al. 1999). Attention to how policy can either transform or (re)produce relations of power may be especially relevant for small and rural settings, who are often marginalized by processes that centralize decision-making in larger administrative centres (Coates and Polzer 2014).

Inter-sectoral responses have been discussed in relation to the legitimacy of integrating health into policies concerned with other areas of action, and for fostering understanding between actors with different sets of knowledge and ways of framing a problem
(Gagnon, Turgeon, and Dallaire 2007). Practitioners have established connections with municipal and regional governments and community organizations, which are embedded into the organization of public health. Evidence has accumulated that healthy public polices often depend on multi-actor processes, broadly defined as ‘intersectoral action for health’ (Shankardass et al. 2012; Epping-Jordan et al. 2005). Multiple government sectors and civil society are usual or accepted partners in planning and delivering initiatives. The absence of existing partnerships between participants in this study and private sector organizations is not uncommon. There have been well-publicized calls to form new alliances with private sector or industry partners (Lang and Caraher 1998). However, many authors have expressed significant reservations on the role of industry as public health partners (Hawkes and Buse 2011). Considering these debates, it is not unexpected that practitioners may face uncertainty at the local level, particularly in areas that have fewer resources to initiate and manage partnerships. As interest in stores as interventions sites has increased, several studies report on the practices and perspectives of retail store operators to assess intervention feasibility (D’Angelo et al. 2011; Song et al. 2011; O’Malley et al. 2013), or as part of intervention evaluations (Pitts et al. 2013). Our results indicate that engagement with local retail operators is one part of the evidence that practitioners may require for healthy public policy development in retail settings.

Based on our results, we note several implications for bridging the research and practice of healthy public policy development in smaller cities and rural regions. First, the paucity of examples of healthy public policies in these contexts may not indicate an impasse of action, but instead a lack of reporting on the everyday practices of practitioners working on health promotion at the local level. Partnered research approaches between researchers and practitioners may help to bridge that gap. Research partnerships may also be fruitful for advancing calls to better integrate and account for context in population
health in the design, delivery and evaluation of population health interventions. We identify opportunities to systematize practice-based observations into conceptual models, and for methodological developments that test the relative influence of different contextual features. Such developments are critical to advancing healthy public policy and ensuring that interventions achieve their desired effects. Next, we identify the need to engage retail operators to understand retail settings at the local level. Retail operators likely also negotiate community contexts, which can provide valuable information on whether interventions will thrive or fail in local settings. Researchers may be able to facilitate these partnerships through local planning processes, intervention pilots and research on the beliefs, practices and interest of retail operators.

5.5.1 Strengths and limitations

An embedded qualitative approach has some strengths and limitations. The primary author’s (RH) shared role in project implementation and familiarity with the ‘institution’ of public health conferred ‘access, entry and a common ground from which to begin the research’ (Dwyer and Buckle 2009), and facilitated rich description of the contextual considerations of decision-making. During project meetings, RH was treated as ‘one of the team’ in the process of decision-making. The rationale for conducting interviews was to formalize reflection on these decisions and to elicit ‘data’ (outside of my field notes and observations) that could be reported in the results of this study. The familiarity established during the two-year partnership was a liability in this regard, as often the interviewees did not think it necessary to explicitly recount earlier interactions. This is a common pitfall of qualitative research, particularly when interviewing professionals or ‘elites’ (Delaney 2007). To this end, much of the richness that emerged during less formal data collection is not fully captured in quotes from dialogic workshops or qualitative interviews.
5.6 Conclusion

This paper examined enabling factors for healthy public policy development for retail settings in smaller cities and rural regions. While this paper focussed on a planning process in Northern BC, implications can be drawn for other areas in the Canadian ‘Provincial’ North. Further attention and investment needs to be given to community partnered approaches that embed research into the practice of healthy public policy action to ensure evidence is relevant and applicable in such practice contexts. This direction is aligned with prominent calls to better account for context in the design, delivery and evaluation of population health interventions.
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Retail regions as an important scale of analysis
in rural settings: Fruit and vegetable availability
and variety in smaller grocery stores and chain
supermarkets in British Columbia, Canada

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Declaration: R.H. devised the project and main conceptual ideas, led the research
partnership, collected data, performed data analysis and interpretation and drafted the
manuscript. C.L.M. contributed to project design and [something that reflects FRESH-IT
and more substantive contribution to manuscripts). D.C. contributed to data analysis.
C.L.M, B.P and D.C. supervised the project, discussed the results and provided
comments on the manuscript.
Healthy public policy is widely recognized as an important tool for improving the environments that shape individual health behaviors. While there has been substantial focus on healthy public policy to address underlying determinants of health in urban environments (WHO 2008), less attention is paid to smaller cities and rural and remote regions. This gap is not directly addressed in public health literatures, but rural and regional scholars have lamented that less research occurs in smaller and rural settings (Langille et al. 2009; Meligrana 2003). In Canada, for example, 12.4% of the population live in small population centres between 1,000 and 30,000, while another 18.7% live in rural areas under 1,000 (Government of Canada 2017). Populations living in small centres and rural areas are particularly important in healthy public policy research as they share common health challenges, and bear a disproportionate burden of poorer health outcomes compared to their urban counterparts (Pong, DesMeules and Lagacé 2009; Ryan-Nicholls 2014).

Food environments that provide equitable access to nutritious foods are an important aspect of healthy community planning. Glanz et al.’s (2005) well-accepted model of the food environment includes the spatial accessibility of retail food outlets, and the availability, quality and promotion of food in stores. Audits of the food environment in smaller cities and rural and remote areas have been limited (Minaker et al. 2016), but a growing evidence base indicates poor access and availability, which may be complicated by physical, social and cultural features of place unique to rural environments (Cummins et al. 2010; Lucan and Mitra 2012).

In this paper, we contend that contributions from rural and regional studies enable the examination of practice-based observations of regional connectivity and heterogeneity. Indeed, the connectivity of the region under analysis was a key consideration for practitioners who identified the need for evidence at a regional scale to support
intervention planning, that also attends to how contextual may be more or less relevant to particular localities (see Hasdell et al. – Chapter 5). The concept of a functional region has been discussed by rural and regional scholars to help define and study regions characterized by significant economic, spatial, social and political interconnections. We offer that functional regions may have additional utility for describing how regions are also linked through their food retail environments. The main aim of this paper is to report on an audit of the food retail environment that is responsive to the unique conditions of smaller cities and rural regions. We specifically examine if functional regions are a way to account for contextual differences between different store types that are embedded within localities but connected at a regional scale.

We develop the idea of a functional retail food environment and its relevance to healthy public policy development in smaller cities and rural regions in several ways. First, we review how functional regions have been described in the planning and governance literature, where this concept has been successfully utilized in contexts that epitomize a blurring of boundaries between urban and rural places. Next, we describe a community-university planning process to engage public health practitioners in identifying features of smaller centres and rural and remote communities that could be considered in retail food environment interventions, where interconnections between communities was raised by public health practitioners as central for planning interventions to improve access to healthier foods in retail settings. Third, we report on a food environment audit of a region in Northern British Columbia Canada that was prioritized by public health practitioners. Finally, we conduct an exploratory analysis of the availability and variety of fresh, frozen and canned fruits and vegetables at the functional regional level according to store-level characteristics for all stores within a defined functional region. We chose fruits and vegetables for this exploratory analysis as they are a key component of healthy diets, associated with positive health outcomes, and used in several studies as an outcome to
evaluate the impact of retail environments on individual diets (Dean and Sharkey 2011; Cummins, Flint and Matthews 2014)

6.1 Background

6.1.1 Using ‘functional regions’ to support planning and governance in non-urban areas

Growing global urbanization is often cited in the healthy public policy literature, but does not always account for significant variation in both population-based and socio-cultural definitions of urbanity and rurality, or for the interactions between urban spaces and rural hinterlands. Population-based definitions can vary (Minore et al. 2008). This may result in differences in estimations of proportions of rural and urban populations depending on the classification system that is used (Tourneau 2018). Urban is often treated as an intuitive concept; however, the way in which populations are segmented often depends on the field of research or study question, and can include large population ranges (Breckenkamp et al. 2017). Likewise, while rural is often considered as a residual category for anywhere that is not urban, the experience of rurality is similarly shaped by reasons for living in rural areas, socio-cultural influences, norms, lifestyles, employment trends, and the level of metropolitan influence from neighbouring urban areas (Tourneau 2018; Paddison and Calderwood 2007; Reimer 2006). Further, urban, small centre and rural form are not always driven by population size, and population size says nothing of the interdependencies between them in terms of the provision and access to services.

Functional regions are a geographical concept that may be useful for re-conceptualizing classifications of rural and urban and for better understanding interdependencies between urban and rural areas. For proponents of regionalism, a region represents a manageable
scale for understanding economic, social and environmental impacts, and for designing appropriate responses (Markey, Halseth and Mason 2008). Functional regions are defined as networked spaces characterized by multiple flows and dependencies, including interconnected labour, land and housing markets, leisure activities, services and patterns of consumption (Karlsson and Olsson 2006; Woods 2009). The concept has become important to the discipline of municipal and regional policy and planning in Western European countries as landscape, economic and demographic shifts blur the divide between rural and urban areas, and trends such as ‘suburbanization’ of the urban fringe challenge accepted definitions of both rural and urban areas (Tourneau 2018).

Several concepts relevant to functional regions have been proposed in the literature. ‘City regions’ are centres of economic activity with adjacent rural districts that are dominated by interactions with the centre, while ‘exurbia’ is defined as rural areas characterized by in-migration from nearby towns and cities (Woods 2009). In this way, a functional region typically covers several administrative regions or jurisdictions, which has important implications for the coordination of activities that support labour markets, infrastructure development and related planning processes (Karlsson and Olsson 2006). Functional regions are often defined for government administrative or statistical purposes and have also been understood in relation to population and traffic flows, trade in goods, and service connections. Taxonomies such as the Metropolitan Influence Zone (MIZ) in Canada (McNiven, Purderer and Janes 2000), and the Urban Influences Codes (UIC) and Rural-Urban Continuum Codes (RUCC) in the United States, aim to quantify differences within rural and urban classifications (Hall, Kaufman and Ricketts 2006). For example, the Canadian MIZ classified census subdivisions (CSDs) according to four categories of influence of adjacent Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs). CSDs with a higher percentage of residents commuting to the CMAs and CA’s for work are assigned a stronger influence.
6.1.2 Applying functional region framings to retail food environment research

There are several applications of regional approaches to retail food environment assessment in the rural retail food environment literature. These studies articulate regional boundaries and the composition of populations therein. For example, regional boundaries are often applied to examine differences in accessibility and availability between urban and rural retail environments (Liese et al. 2007; Jithitikulchai, Dean and Sharkey 2012). Another strategy is to compare food access based on the socio-economic and ethnic composition of smaller areas (neighbourhoods) across a wider geographic area (Dean and Sharkey 2011; Dean, Sharkey and St. John 2011). Finally, some research has examined regional differences in access for specific communities with a disproportionate burden of diet-related disease (Leone et al. 2011).

Specifying the boundaries of a functional region is a foundational challenge. The most common approaches are to: (1) define a study area based on pre-existing administrative boundaries and/or (2) establish inclusion and exclusion criteria for a representative store sample that defines rural/urban stores or different store types (Gustafson et al. 2013). Buffers surrounding ‘reference points’ such as dwellings, schools or places of employment adjacent to or surrounding a food store, neighbourhood centroid or travel network can be defined in several ways. Circular buffers use a radius based on a theorized distance that an individual may be willing to travel to reach a certain type of retail establishment. Many studies test multiple buffer areas and the size of buffers may vary widely, ranging from 100 meters to 2 miles in one review (Holsten 2009). These are mainly examined in urban areas where shorter travel distances are expected between residences and retail stores. Network buffers are based on accessibility of different transportation modes, such as walking or cycling (Larsen and Gilliland 2008). In
addition to buffer zones, many studies use administrative definitions to define study areas, such as census tracts or postal units, or areas defined by study authors (Charreire et al. 2010). One of the aims of this study was to identify a study area that would be meaningful for how planning and service delivery are organized in a regional health authority.

6.2 Methods

We employed an exploratory, sequential design, where qualitative and then quantitative data were collected in consecutive phases of research to facilitate an iterative approach to applied research project development (Creswell and Plano Clark 2011). In the first phase, qualitative methods were used to examine practitioner perspectives on the ‘physical, cultural, social, economic and political realities of their communities’ (Nykiforuk et al. 2013) that should be considered in intervention planning. In the second phase, key constructs were then incorporated into a plan for secondary quantitative analysis of geographic and administrative data, and primary observation of the retail food environment using a standardized assessment measure.

6.2.1 Study setting

This study was carried out in 2016-2018 under the umbrella of Food Retail Environments Shaping Health – Intervention toolkit (FRESH-IT), a pan-Canadian initiative to accelerate the development of locally relevant solutions to improve retail food environments in smaller, rural and remote jurisdictions. The British Columbia implementation site was co-led by the lead author (RH) and Northern Health (NH), a regional health agency in British Columbia, Canada. A core team was selected to represent public health functions relevant to promoting healthier food environments, and included the Chief Population Health Dietician and subject matter leads for Food
Security and Healthy Community Planning. Ethical approval for the research was provided by the University of Toronto Research Ethics Board in March 2016.

NH delivers all health services in the northern two-thirds (or 600,000 square kilometers) of British Columbia, a region the size of France that serves approximately 300,000 people in sparse, demographically diverse communities. Like other parts of Canada’s ‘Provincial North’ (Coates and Poelzer 2013), the region is comprised of smaller population hubs and disperse rural and remote populations. While the region is serviced by several major highways and a massive system of rural roads, some communities are accessible only by boat or plane. The region has higher rates of diet-related disease than the provincial average, however, rates are comparable to other parts of Canada’s provincial north (Allison 2016).

The intent of the partnership was to generate data that would inform policy and program planning relevant to the region’s strategic priority of supporting ‘healthy people in healthy communities’. Existing food security activities implemented by NH are organized according to three main streams of work: efficacy strategies (i.e. food banks, food vouchers, etc.); participation/transition strategies (e.g. community gardens, community kitchens and good food box programs); and, redesign/system change strategies (e.g. food policy councils, food networks, etc.). The health region additionally delivers several provincially mandated programs. Most relevant to the retail food environment assessment conducted for this project is Food Costing in BC. Food costs in BC are assessed every two years in the last week of May/first week of June by the five regional health authorities using Health Canada’s National Nutritious Food Basket tool, which measures the cost of a standard basket of food items in randomly selected, full-service grocery stores (BC Centre for Disease Control 2018). The average monthly cost in 2016 of an adequately nutritious diet for a reference family of four in the Northern
Health Region was $1,038, above the Provincial average of $1,019. The retail assessment conducted for this study aimed to address several gaps in existing data. First, we report on additional measures of access, such as the availability and variety of food in stores. Additionally, we include data from stores that carry only a small number of items to demonstrate potential differences across different types of stores, which are geographically patterned.

6.2.2 Phase 1 Qualitative methods: Identifying relevant contextual factors for retail environment assessment

6.2.2.1 Data collection

Participant observation, workshops and key informant interviews were used to identify relevant factors for retail environment assessment and analysis. Participant observation was conducted over the course of the project by RH during design and implementation meetings with the NH project co-lead and steering committee. Observations on features of context relevant to the study setting were recorded in routine project documentation and supplemented by detailed field notes. Participant observation was complemented by three half-day workshops in June 2017 with public health professionals (N=12) representing various public health roles and functions. The workshops employed two case vignettes that incorporated key themes emerging from observation with the core project team. The workshops were audio-recorded and summary notes were developed with ‘targeted transcription’ of quotes relevant to the analytic framing of this project. Finally, qualitative interviews were conducted with key informants from public health, local government and the community sector (N=5). A purposive sample was selected to triangulate across interviews, participant observation dialogic workshops. With consent, interviews were audio-recorded and transcribed verbatim. To ensure the confidentiality
of individual participants, direct quotes reported in the results are identified by the data source (i.e. workshop or interview) and a numeric code. Responses from workshops are indicated with the code ‘WK’, and interviews are denoted with the code ‘I’. All participants worked in health, government and community organizations, and are referred to as ‘practitioners’ in the reporting of results.

6.2.2.2 Analysis

Qualitative data from the dialogic workshops were analyzed using thematic analysis (Braun and Clarke 2006). First, data was analyzed deductively using sensitizing concepts derived from a Canadian Institutes for Health Research (CIHR) and Medical Research Council (MRC) guidance document for examining context in population health intervention research (see Craig et al. 2018). Craig et al. 2018 characterize individual, socio-cultural, spatial, institutional, economic and political factors relevant to intervention design, delivery and evaluation. Key factors from the Craig et al. (2018) framework were identified in a previous phase of the research (see Chapter 5 for key concepts of interest to practitioners). Descriptive patterns were used to identify higher-order conceptualization and theorization. In the case of this paper, institutions and settings and knowledge were relevant for considering how and why functional regions may be a concept of interest to practitioners (see Chapter 5 for a more in-depth discussion of these higher order concepts). In this way, we began with analytic deductions and proceeded to inductive analysis based on the conceptualization above (Patton 2015). To ensure trustworthiness, findings were validated by the project committee in planning meetings that integrated emergent concepts into the design of a plan to collect primary data on the retail food environment.
6.2.3 Phase II: Applying the concept of a functional region to an audit of the retail food environment

6.2.3.1 Data collection

The project steering committee identified several smaller regions in the overall Northern Health administrative region with labour, economic, goods, leisure and service interdependencies. Each identified smaller region included both small cities and adjacent rural areas. Due to the large geographic size of the overall region and capacity constraints of the project team, the project steering committee prioritized a smaller region where a community coalition had begun to organize around food system issues, which practitioners identified as important to the long-term feasibility of the project.

The main aim of the quantitative analysis plan was to operationalize store characteristics of interest and to examine practitioner observations related to differences in availability and variety across different store types. Food stores were identified from a database maintained by Northern Health for food inspection purposes. All stores within a 100-kilometer north-south buffer of a 300-kilometer east-west highway artery were geocoded in a geographic information system package (ArcGIS, 10.6.1). The buffer was conceptualized to reflect the distance between many rural places and their nearest small urban centre. During data collection, we used ‘ground-truthing’ to identify stores that were included in the database but no longer in operation, and to add new stores that were not identified in the initial dataset. Ground-truthing is a common method in retail environment assessment to ensure the accuracy of data sources (Rossen, Pollack and Curriero 2012).

Observational data on food in stores was collected over a one-week period in October 2017. The lead researcher (RH) visited each store in-person and recorded food
availability, price and quality using a version of the Nutrition Environment Measurement Survey (NEMS-S) (Glanz et al. 2007). Modifications were made to the NEMS-S to reflect regional food and brand preferences and to include a greater variety of fruits and vegetables and pantry items that are typically surveyed by Northern Health staff during bi-annual food costing exercises. In addition, name (or reference) brand and private label brand availability were counted, as opposed to the original survey where only a limited number of varieties were assessed.

This paper reports fresh, frozen and canned vegetables measures in the NEMS-S. We measured the availability of seven fresh fruit items, 12 fresh vegetable items, one frozen fruit item, one frozen vegetable item, two canned fruit items and two canned vegetable items. For all fresh, frozen and canned categories, availability of additional varieties was noted on a scale of 0 up to 6+. A variety index was calculated by summing availability of all individual fruits and vegetables and additional varieties and creating median cut-offs to create a ‘basic’ and ‘high’ variety basket of all fresh, frozen and canned fruits, and all fresh, frozen and canned vegetables. Basic variety baskets included 0-5 items and high variety baskets included 6-25 items.

6.2.3.2 Analysis

Descriptive statistics were used to summarize the proportion of each of the food items available across all stores. There was limited availability of fresh, frozen or canned fruits and vegetables in convenience stores, or in stores classified as ‘other.’ Therefore, statistical tests were only applied to grocery stores and supermarkets. Chi-square tests were conducted to analyze relationships between availability and variety for grocery stores and supermarkets, where the number of observations for some items did not meet
the assumptions of Chi-square, Fisher’s Exact test was used. All analyses were carried out using SPSS (*Version 1.0.0.1072*).

### 6.3 Results

#### 6.3.1 Assessing retail environments at a regional scale

Qualitative methods supported the conceptual premise of this paper that functional regions are important to the assessment of the retail environments in smaller cities and adjacent rural regions. Measures of proximity and density were raised as outcomes of interest to examining the accessibility and availability of healthier foods between communities. Participants identified that potential differences might be relevant to travel that is normalized and routinized in communities within a rural region. Public health professionals identified that people living in communities served by Northern Health undertake significant travel for goods, and that this travel for food is often conducted at the same time as work, leisure or service (e.g. medical appointments) activities:

> “And if we think of all the people that actually travel here and might be doing many things, I can see where they might choose the Walmart Superstore, as their place to do everything. Because it’s one stop versus two or three or four stops” I-10

The implication is that local-level healthy public policy actions may have impacts at the regional level. One participant shared the following when describing a project they were currently leading:

> “… so we are going to be crossing jurisdictional boundaries so the sooner we can get Regional Districts like working together to support projects, the better it's going to be which is another reason why I was happy to be working at a federal and provincial level because those boundaries for voting are a lot
Participants raised several implications of regional travel for intervention planning. For example, retailers in larger hub communities may be more important to retail exposures than the most proximate outlet. Similarly, policy interventions in one community may have impacts beyond the constituency an intervention aims to target. The ability to travel may also intersect with demographic characteristics in ways that are important to health equity:

“Well, transportation is huge. I don’t know if that's along the line – if we have a store that is far, and we have young families, if a bus route doesn’t go that away – I don’t know if transportation is included at all in accessibility. I find that especially for rural communities, if they have their mega grocery store in an outlying community but they don’t have a way of getting there, we might see them going to the town pantry and picking out less nutritious options because they simple can’t get to the grocery store because of transportation”

Participants also raised that travelling longer distances for food may impact selection of more shelf-stable items due to perishability and of items that maximize the total value of purchases and offset the cost of travel.

With these considerations, participants identified that the type of store was a relevant characteristic for examining differences in availability and variety within a region. They noted the significant diversity in the types of stores that carry food items in some communities, and raised the importance of including non-traditional retailers, or retailers who do not carry a full range of product categories, in the regional assessment. They further hypothesized that more rural communities were likely to be serviced by
independently-owned, smaller stores with fewer grocery items, and that those stores were likely to be impacted by resident travel to larger, chain supermarkets for greater availability and variety of items, and more brand choice within items (for example, different varieties or brands of canned peaches).

6.3.2 Description of a sample of retail food environments across a functional region

The study area contained 41 stores located across 11 communities, including 7 supermarkets, 9 grocery stores, 2 pharmacies, 5 discount stores, 4 speciality stores, and 14 convenience stores (Table 6.1). 10 stores (24%) were in rural communities <1000, 9 stores (22%) in population centres between 1001-5000, 11 stores (27%) in population centres between 5001 and 10,000 and 11 stores (27%) in communities >10,000. Supermarkets were more common in population centres >5,000, while grocery stores were more common in population centres <1,000 and rural areas. All grocery and specialty stores were independently owned, while all supermarkets, discount stores and pharmacies, and all but one convenience store, were part of provincial or national chains.
Table 6.1. Distribution of four types of food retailers by population size and ownership type across a functional region in Northern BC (N=41)

<table>
<thead>
<tr>
<th>Store Type</th>
<th>Supermarket(n=7)</th>
<th>Grocery(n=9)</th>
<th>Convenience(n=14)</th>
<th>Other(n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Size&lt;1000</td>
<td>0 (0%)</td>
<td>5 (55.6%)</td>
<td>3 (21.4%)</td>
<td>2 (18.2%)</td>
</tr>
<tr>
<td>1001 – 5,000</td>
<td>0 (0%)</td>
<td>4 (44.4%)</td>
<td>4 (28.6%)</td>
<td>1 (9.1%)</td>
</tr>
<tr>
<td>5001 - 10000</td>
<td>3 (42.9%)</td>
<td>0 (0%)</td>
<td>3 (21.4%)</td>
<td>5 (45.5%)</td>
</tr>
<tr>
<td>10,000 and above</td>
<td>4 (57.1%)</td>
<td>0 (0%)</td>
<td>4 (28.6%)</td>
<td>3 (27.2%)</td>
</tr>
<tr>
<td>Ownership type Chain</td>
<td>7 (100%)</td>
<td>0 (0%)</td>
<td>13 (92.9%)</td>
<td>2 (18%)</td>
</tr>
<tr>
<td>Independent</td>
<td>0 (0%)</td>
<td>9 (100%)</td>
<td>1 (7.1%)</td>
<td>9 (82%)</td>
</tr>
</tbody>
</table>

¥ - Population categories derived from Statistics Canada 2016 census data
€ - Ownership defined by number total numbers of provincial or national locations.

6.3.3 Audit of fruit and vegetable availability and variety

The descriptive availability of fruits and vegetables for all store types surveyed with the NEMS-S are displayed in Table 6.2. Grocery stores and supermarkets carried the most fresh and frozen FV. Convenience stores had very limited fresh fruits, and no fresh vegetables or frozen items. Stores categorized as ‘other’ carried no fresh fruits and vegetables, and a limited variety of frozen and canned fruits and vegetables.

Given the limited number of observations of fresh, frozen and canned fruits and vegetables in the convenience store and other store types, we then compared grocery
stores and supermarkets where availability was more robust, and to meet the assumptions of statistical tests (i.e. Chi-square). There was no association in the availability of any fresh, frozen or canned fruits and vegetables when comparing grocery stores and supermarkets. For more detailed comparisons for each food, see supplementary Table 6.4 at the end of this chapter.
Table 6.2. Availability of fresh, frozen and canned fruits and vegetables by four types of retailers across a functional region in Northern BC (N=41)

<table>
<thead>
<tr>
<th>Store Type</th>
<th>Grocery (n=9)</th>
<th>Convenience (n=14)</th>
<th>Other (n=11)</th>
<th>Supermarket (n=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh, Frozen and Canned Fruit and Vegetable Availability</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
<td>n %</td>
</tr>
<tr>
<td>Fresh fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td>6 66.7</td>
<td>3 21.4</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Apples</td>
<td>8 88.9</td>
<td>4 28.6</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Oranges</td>
<td>6 66.7</td>
<td>5 35.7</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Grapes</td>
<td>5 55.6</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Blueberries</td>
<td>2 22.2</td>
<td>0 0</td>
<td>0 0</td>
<td>5 71.4</td>
</tr>
<tr>
<td>Strawberries</td>
<td>4 44.4</td>
<td>0 0</td>
<td>0 0</td>
<td>6 85.7</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>7 77.8</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Canned fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>6 66.7</td>
<td>7 50</td>
<td>5 45.5</td>
<td>7 100</td>
</tr>
<tr>
<td>Pineapple</td>
<td>8 88.9</td>
<td>6 42.9</td>
<td>5 45.5</td>
<td>7 100</td>
</tr>
<tr>
<td>Frozen fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frozen strawberries</td>
<td>7 77.8</td>
<td>0 0</td>
<td>2 18.2</td>
<td>7 100</td>
</tr>
<tr>
<td>Fresh vegetable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrots</td>
<td>8 88.9</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>8 88.9</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Lettuce</td>
<td>8 88.9</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Turnip</td>
<td>6 66.7</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Cabbage</td>
<td>7 77.8</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>7 77.8</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Potatoes</td>
<td>7 77.8</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Onions</td>
<td>8 88.9</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Bell pepper</td>
<td>8 88.9</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Celery</td>
<td>6 66.7</td>
<td>0 0</td>
<td>0 0</td>
<td>6 85.7</td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>5 55.6</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Cucumber</td>
<td>6 66.7</td>
<td>0 0</td>
<td>0 0</td>
<td>7 100</td>
</tr>
<tr>
<td>Canned vegetable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>7 77.8</td>
<td>5 35.7</td>
<td>9 81.8</td>
<td>7 100</td>
</tr>
<tr>
<td>Green peas</td>
<td>6 66.7</td>
<td>4 28.6</td>
<td>7 63.6</td>
<td>7 100</td>
</tr>
<tr>
<td>Frozen vegetable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green peas</td>
<td>7 77.8</td>
<td>0 0</td>
<td>1 9.1</td>
<td>7 100</td>
</tr>
</tbody>
</table>

¥ - n represents the number of stores with the given item available for purchase.
Variety results for all store types are reported in Table 4. Of those stores with high variety for both fresh, frozen and canned fruit, and fresh, frozen and canned vegetables, 38.9% were grocery stores, 38.9% were supermarkets, 11.1% were convenience stores and 11.1% were other store types. Of those stores with low variety, 8.7% were grocery stores, 52.5% were convenience stores, and 39.1% were other store types. There were no supermarkets with low variety.

Given the limited number of convenience and other store types with high variety, we then compared grocery stores and supermarkets. Given the small sample size, Fisher’s T was used to assess statistical significance of the reported difference. There were no significant associations between the variety of any fresh, frozen or canned FV in grocery stores and supermarkets. For more information on statistical values, see supplementary Table 6.5 at the end of this chapter.
Table 6.3 Variety of all fresh, frozen and canned fruits and all fresh, frozen and canned vegetables by store type (N=41)

<table>
<thead>
<tr>
<th>Store Type</th>
<th>Grocery (n=9)</th>
<th>Convenience (n=14)</th>
<th>Supermarket (n=7)</th>
<th>Other (n=11)</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety of all fresh, frozen and canned fruits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Variety</td>
<td>2</td>
<td>22.2</td>
<td>12</td>
<td>85.7</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>81.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Variety</td>
<td>7</td>
<td>77.8</td>
<td>2</td>
<td>14.3</td>
<td>7</td>
<td>100</td>
<td>2</td>
<td>18.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Variety of all fresh, frozen and canned vegetables | | | | | | | | | | |
| Low Variety  | 2  | 22.2 | 12  | 85.7 | 0  | 0  | 9  | 81.8 | | |
| High Variety | 7  | 77.8 | 2   | 14.3 | 7  | 100 | 2  | 18.2 | | |

¥ Variety was derived from the sum of the total number of individual items available in each category and additional items in each category, up to a total of 6 additional items. Low variety stores are defined as 0-5 items, and high variety stores are defined as 5-25 items.

### 6.4 Discussion

The main aim of this project was to operationalize a methodology for a food retail environment assessment that is responsive to the contextual considerations of healthy public policy development in smaller cities and rural regions. The purpose of the assessment was to provide practitioners with evidence to inform locally-relevant population health interventions to promote health-enabling retail environments. There is limited evidence on how rural retail environments may differ from urban settings, where research has rapidly expanded in the last 10 years (Holsten 2009; Larson, Story, and Nelson 2009; Lytle and Sokol 2017; Giskes et al. 2011). While the Canadian evidence...
base is growing, there are only a handful of Canadian studies that report on the retail food environment of smaller cities and rural regions (Minaker, Cook et al. 2016). Our results add to the evidence base on rural retail environments. A novel contribution of this work is the way it places retail environment research in conversation with rural and regional planning, which has a longer history with the contextual considerations of policy and program design for non-urban centres. By focussing on context, we forward that retail environment assessment is more than simply a technocratic exercise. Rather, it is a broader planning process. Functional regions are therefore both a methodological approach, but also a concept that implicates institutional and community considerations. We discuss both interpretations here.

Our finding that regions are a relevant scale of analysis is reflected in other studies of rural retail availability and accessibility, which also assess stores in multiple communities within a defined boundary (Charreire et al. 2010). Our study adds to this literature by describing a process which validates why regions are an appropriate scale, particularly when the intention is to apply research findings into population health intervention planning. Regarding assessment design, defining a region was both a pragmatic and analytic decision. The scale of the ‘Provincial North’—or those regions between namely ‘southern’ urban centres and the territorial north—pose a significant challenge for retail environment research in rural Canada. Our team experienced concerns that have been described elsewhere developing a tool appropriate to diverse community contexts, and in deciding where that tool should be used (Skinner et al. 2016). This should not be taken to discount the utility of a regional approach. Based on consultation with practitioners, we defined a functional region that was connected through employment, leisure, goods and services, and where practitioners felt there may be multi-sectoral interest in retail environment interventions based on existing food initiatives. Results from assessment planning indicated that practitioners expected that
contextual considerations of the region would impact on store-level variables such as availability and variety.

In this analysis, there were no difference in the availability or variety of fresh, frozen and canned fruit and vegetable availability and variety between small- and medium-sized grocery stores, and larger supermarkets. All larger chain supermarkets were in population centres over 5,000 and all smaller- and medium-sized grocery stores were in population centres less than 5,000. We were not able to assign stores with geographic variables due to methodological concerns, however taken together with the findings on availability, our results may indicate fewer spatial differences in accessibility than have been reported elsewhere. These findings run counter to the expectations of practitioners who participated in designing the retail assessment, and from findings that have been reported in other non-urban retail settings. Several studies have demonstrated that supermarkets often carry an overall greater variety of goods – including healthier items – than smaller stores (Connell et al. 2007; Cummins et al. 2010; Dean, Sharkey and St. John 2011; Gantner et al. 2011; Jithitikulchhai, Dean, and Sharkey 2012), and that small stores carry less fresh produce (D’Angelo et al. 2011).

These differences have been explained by the complex relationship between personal mobility, income and transportation options in non-urban regions. Rural customers are more likely to frequent supermarkets for larger weekly or monthly shopping trips while relying on small shops and convenience stores for ‘top-up’ shopping (Scarpello et al. 2009), and to base their shopping on a combination of convenience, price and product range (Clarke and Banga 2010). There is also evidence that people will bypass local suppliers of a range of goods and services for a nearby large centre if the service or price is perceived to be better (Halseth and Ryser 2006).
The lack of significant association between store-level variables and fruit and vegetable availability and variety raises several questions. It is unlikely that practitioner observations on community context are wholly inaccurate. The observations raised by participants in this study are congruent with how retail environments have been theorized, and with economic and social dynamics in smaller and rural regions. Retail environments are ‘relational’ spaces that are multi-scalar, separated by socio-relation distances and dynamics, and where different assets may be available to populations at different times and in different spaces (Cummins et al. 2007). These dynamics are not unique to food retail; “space is becoming increasingly “slippery” in the sense that capital, goods, people and ideas travel more easily” (p. 136, Barca, McCann, and Rodríguez-Pose 2012). This may suggest that retail environment data should be interpreted or contextualized through a wider lens that considers the routine practices and culture within retail settings, and in the communities where retail settings are embedded. The methodological challenge of this approach is discussed in Chapter 5.

We raise the need to apply methods for understanding these dynamics within the context of a functional region. In urban retail research, techniques have been applied to integrate individual mobility, spatiotemporal dynamics and transportation to examine retail food access as a dynamic, relational process (Chen and Kwan 2015; Salze et al. 2011; Widener et al. 2013). For example, research has examined the spatial movement of commuters (Widener et al. 2013) and transit users (Widener et al. 2015), as well as how changes in transportation environments over a defined period impact food access (Widener et al. 2017). Regional spatial patterns are examined by Salze et al. (2011) in an administrative region of urban, suburban and rural areas, however few studies have applied these techniques to small and rural regions.
Thus, these results surface additional questions on how residents in more interconnected regions shop for food, and make trade-offs between food and transportation costs (Gantner et al. 2011). We were not able to address travel patterns in our study design, however recognize that travel is embedded in a functional regional view. Despite some of the questions that remain from these results, the availability and variety of fruits and vegetables in grocery stores in our study suggest that smaller stores may be an important part of regional retail environments, while also surfacing additional questions on how residents in more interconnected regions shop for food, and make trade-offs between food and transportation costs (Gantner et al. 2011). The broader study employed storeowner interviews to triangulate the relevance of regional travel, and to better understand the availability of items despite anticipated differences between stores. These interviews are discussed in Chapter 7.

6.4.1 Study limitations

We acknowledge several limitations in the study design. There were significant challenges classifying stores in Northern communities. While supermarkets are identifiable, ground-truthing revealed significant diversity between the small- and medium-sized stores. A more precise store-level variable (e.g. square footage, total number of items) may be a more accurate measure for analyzing differences between stores. We adapted the NEMS tool to measure additional varieties of fresh, frozen and canned vegetables, but observations were limited to a total of 6 or more additional items. This may have underestimated the extent of differences between larger supermarkets and smaller- and medium-sized grocery stores. We did not analyze availability of all items included in the NEMS-S, or include data on price in our analysis. These may be additional important variables for explaining differences between stores. Finally, the lack of consumer or community perspectives is a significant limitation for understanding how
stores are differentially perceived and experienced based on socio-demographic and socio-cultural factors that are relevant for understanding accessibility within functional food retail environment regions on accessibility.

6.5 Conclusion

The main aim of this article was to describe the process for developing a retail environment assessment plan in a project to identify locally-relevant solutions to enable more health promoting retail environments in small and rural Canadian jurisdictions. A functional region was an appropriate scale to examine differences in the availability and variety of fresh, frozen and canned fruit and vegetables, which are an important part of healthier diets, and a significant focus of public health nutrition promotion. These results add to the nascent field of rural retail environment research in Canada. The lack of information on retail food environments in small and rural regions poses a major challenge for decision-makers looking to prioritize healthy public policies for food retail environments. This is especially salient as policy approaches appropriate for larger urban centres may not be suited to non-urban retail food environments, and the unique demographic, geographic and social features of place that intersect with retailer practices and individual or household purchasing behaviors.
6.6 Supplementary Tables
Table 6.4 Supplementary Table, Availability of fresh, frozen and canned fruits and vegetables by independent grocery stores and chain supermarkets (N=16)

<table>
<thead>
<tr>
<th>Store type</th>
<th>Grocery (n=9)</th>
<th>Supermarket (n=7)</th>
<th>Pearson Chi-Square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fresh, Frozen and Canned Fruit and Vegetable Availability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fresh fruit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td>6  66.7</td>
<td>7  100</td>
<td>2.87</td>
<td>.21</td>
</tr>
<tr>
<td>Apples</td>
<td>8  88.9</td>
<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td>Oranges</td>
<td>6  66.7</td>
<td>7  100</td>
<td>2.87</td>
<td>.21</td>
</tr>
<tr>
<td>Grapes</td>
<td>5  55.6</td>
<td>7  100</td>
<td>4.15</td>
<td>0.09</td>
</tr>
<tr>
<td>Blueberries</td>
<td>2  22.2</td>
<td>5  71.4</td>
<td>3.88</td>
<td>0.13</td>
</tr>
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<td>4  44.4</td>
<td>6  85.7</td>
<td>2.86</td>
<td>.15</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>7  77.8</td>
<td>7  100</td>
<td>1.78</td>
<td>.48</td>
</tr>
<tr>
<td><strong>Canned fruit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>6  66.7</td>
<td>7  100</td>
<td>2.87</td>
<td>.21</td>
</tr>
<tr>
<td>Pineapple</td>
<td>8  88.9</td>
<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Frozen fruit</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frozen strawberries</td>
<td>7  77.8</td>
<td>7  100</td>
<td>1.78</td>
<td>.46</td>
</tr>
<tr>
<td><strong>Fresh vegetable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrots</td>
<td>8  88.9</td>
<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>8  88.9</td>
<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td>Lettuce</td>
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<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td>Turnip</td>
<td>6  66.7</td>
<td>7  100</td>
<td>2.87</td>
<td>.21</td>
</tr>
<tr>
<td>Cabbage</td>
<td>7  77.8</td>
<td>7  100</td>
<td>1.78</td>
<td>0.48</td>
</tr>
<tr>
<td>Mushrooms</td>
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<td>7  100</td>
<td>1.78</td>
<td>0.48</td>
</tr>
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<td>Potatoes</td>
<td>7  77.8</td>
<td>7  100</td>
<td>1.78</td>
<td>0.48</td>
</tr>
<tr>
<td>Onions</td>
<td>8  88.9</td>
<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td>Bell pepper</td>
<td>8  88.9</td>
<td>7  100</td>
<td>0.83</td>
<td>1.00</td>
</tr>
<tr>
<td>Celery</td>
<td>6  66.7</td>
<td>6  85.7</td>
<td>0.76</td>
<td>.59</td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>5  55.6</td>
<td>7  100</td>
<td>4.15</td>
<td>0.09</td>
</tr>
<tr>
<td>Cucumber</td>
<td>6  66.7</td>
<td>7  100</td>
<td>2.872</td>
<td>.21</td>
</tr>
<tr>
<td><strong>Canned vegetable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>7  77.8</td>
<td>7  100</td>
<td>1.78</td>
<td>.48</td>
</tr>
<tr>
<td>Green peas</td>
<td>6  66.7</td>
<td>7  100</td>
<td>2.87</td>
<td>.21</td>
</tr>
<tr>
<td><strong>Frozen vegetable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green peas</td>
<td>7  77.8</td>
<td>7  100</td>
<td>1.778</td>
<td>.48</td>
</tr>
</tbody>
</table>

* n represents the number of stores with the given item available for purchase
Table 6.5, Supplementary Table, Variety of fresh, frozen and canned fruits and vegetables by independent grocery stores and chain supermarkets (N=16)

<table>
<thead>
<tr>
<th>Store type</th>
<th>Grocery (n=9)</th>
<th>Supermarket (n=7)</th>
<th>Pearson Chi-Square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety</td>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Fresh, Frozen and Canned Fruits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Variety</td>
<td>2</td>
<td>22.2</td>
<td>85.7</td>
<td>0</td>
</tr>
<tr>
<td>High Variety</td>
<td>7</td>
<td>77.8</td>
<td>14.3</td>
<td>7</td>
</tr>
<tr>
<td>Fresh, Frozen and Canned Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Variety</td>
<td>2</td>
<td>22.2</td>
<td>85.7</td>
<td>0</td>
</tr>
<tr>
<td>High Variety</td>
<td>7</td>
<td>77.8</td>
<td>14.3</td>
<td>7</td>
</tr>
</tbody>
</table>

¥ Variety was derived from the sum of the total number of individual items available in each category and additional items in each category, up to a total of 6 additional items. Low variety stores are defined as 0-5 items, and high variety stores are defined as 5-25 items.
6.7 References


https://doi.org/10.17269/cjph.107.5344.


https://doi.org/10.1093/heapro/dar093.

https://doi.org/10.1108/09590550710728093.


7 Understanding retail settings within local contexts: Results from qualitative interviews with retail operators in Northern British Columbia, Canada

This paper is unpublished and unsubmitted work written in manuscript style. The target journal for this paper is Health Promotion International.

Authorship list: Hasdell, R., Poland, B., Cole, D.C.C. and Mah, C.

Declaration: R.H. devised the project and main conceptual ideas, led the research partnership, collected data, performed data analysis and interpretation and drafted the manuscript. C.L.M. contributed to project design and [something that reflects FRESH-IT and more substantive contribution to manuscripts]. C.L.M, B.P and D.C. supervised the project, discussed the results and provided comments on the manuscript.
7.1 Introduction

Retail food environments are increasingly popular settings for healthy public policy to increase access to, acceptability of, and availability of healthier foods. Grocery stores are key intermediaries between global food systems and consumer purchases, and are where most food expenditures are made (Statistics Canada 2014). In response, governments have begun to deploy policy tools to promote more nutritious foods that have impacts at the store-level. As one example, governments globally have contemplated or introduced taxes on sugar-sweetened beverages as a nutrition promotion measures (Vanderlee et al. 2017). In some countries, these measures have faced significant pushback. The recent introduction of a sugary drinks tax in Seattle prompted the introduction of Initiative 1634 at the state level to prohibit ‘grocery taxes’. The initiative is framed to protect consumer and business owners by ‘keeping groceries affordable’ and ‘protecting local jobs’.

Initiatives such as this one underscore the importance of considering retailers who operate as gatekeepers to implementing potential interventions (Pinard et al. 2016), and who need to operationalize policies at the store-level (Mah et al. 2017). It follows that understanding the motivations and practices of retail operators may be important to the feasibility and acceptability of interventions to promote health.

There is a small body of public health literature that examines the business operations and motivations of retail operators (Song et al. 2011; Pitts et al. 2013; Gravlee et al. 2014; Pinard et al. 2016; Khojasteh and Raja 2017). Only a handful of these studies have been conducted in non-urban settings (Abarca and Ramachandran 2005; Pinard et al. 2016; Bardenhagan et al. 2017). In the Canadian context, this speaks to a broader research gap on accessibility and availability in rural retail environments (Minaker et al. 2016), and on intervention planning and delivery in retail stores (Mah et al. 2017). Public
health and allied partners would benefit from understanding the enablers and barriers for retailers to create supportive environments for health (Laska et al. 2018).

To address these gaps, the purpose of this study was to use qualitative methods to understand retailer practices within the context of smaller cities and rural regions. This research was part of a larger project that examined enabling conditions for healthy public policy development in non-metropolitan areas (see Hasdell et al., chapters 5 & 6). Storeowner interviews were conducted to contextualize environmental observation of the consumer food environment within the routine practices and culture of retail stores (see Hasdell et al. Chapter 6). Specifically, this research asks (1) What are the business models and practices of food retail operators in smaller cities and rural regions; (2) What influences retail operators business operations and practices; and, (3) How are contextual factors accounted for and integrated into retail operations?

7.2 Background

There is widespread recognition that availability, accessibility and adequacy of retail food environments influence individual purchasing and health outcomes (Holsten 2009; Caspi et al. 2012). The relationship between food environments and health behaviors and outcomes have mainly been established in the United States and United Kingdom. Canadian research is more nascent, and namely focussed on medium-sized and larger centres. Few Canadian studies examine how smaller cities or rural communities may differ from their urban counterparts (Minaker et al. 2016), despite higher diet-related morbidity and mortality in rural communities (Pong, DesMeules, and Lagacé 2009). The socio-demographic, spatial, socio-cultural and social and political contexts of rural areas
may produce important differences in rural retail environments that limit inferences from urban environments (McGuirt et al. 2015).

Most of the rural retail environment research comes from the United States, where evidence suggests less geographic accessibility to supermarkets and chain grocery stores (Larson, Story, and Nelson 2009). The consensus is that larger, chain supermarkets carry a greater variety of all foods, including more healthful products (Larson, Story, and Nelson 2009). Comparatively, rural residents are more likely to be proximate to smaller food stores, variety stores or convenience stores, with higher prices and less variety of more healthful items (D'Angelo et al. 2011; McGuirt et al. 2015; Pinard et al. 2016).

There are debates on how the type of store where someone shops may impact on individual purchasing patterns, and health outcomes (Oliveira Otto et al. 2018). It is reasonable to assume that policy and intervention planning across different types of stores may confer population health benefits.

There are several distinguishing features of rural environments that may explain differences in the spatial distribution of different types of outlets. Several studies describe that population density, longer travel distances and socio-economic differences may explain the greater representation of smaller, independently owned stores in rural communities (Gantner et al. 2011; Liese et al. 2007). Their presence can also be understood alongside the rise of large format ‘supercentres’ located in expansive, suburban retail centres. While supercentres are typically discussed in research on urban access disparities in availability and accessibility, these stores have large catchment areas, including more distant rural regions, and likely influence the retail model of small stores (Larsen and Gilliland 2008). As such, smaller- and medium-sized stores are a
smaller but important part of food exposures. This is especially true when mobility is restricted by individual or environmental factors (Larsen and Gilliland 2008).

A small but emerging body of qualitative and quantitative research reports on storeowner perspectives to better understand smaller store settings. Most of this research has been conducted in the urban cities in the United States (Andreyeva et al. 2011; D’Angelo et al. 2011; Ayala et al. 2012, 2017; Gravlee et al. 2014; Mayer et al. 2016). There are significant differences between the retail environment in the United States and Canada that may limit the applicability of these results. For example, recent policy changes to the US Special Supplemental Nutrition Program for Women, Infants and Children (WIC) require WIC-certified stores to carry a package of healthier items. The barriers and opportunities of this program and its impact on healthier environments is a significant theme in both the rural and urban literature in the United States (Andreyeva et al. 2011; Ayala et al. 2012). Canada does not have a comparable social program. Additionally, only a handful of studies have been conducted in rural areas (Pinard et al. 2016; Bardenhagen et al. 2017; Laska et al. 2018). Storeowner practices present opportunities and challenges to forward healthy public policies for nutrition promotion. Storeowners bring important skills in business and sales that are often unfamiliar to public health partners, and instances of ‘positive deviance’ can provide useful strategies for intervention planning (Khojasteh and Raja 2017). Alternately, interventions may be hindered by existing practices that conflict with intervention aims, or that may undermine the viability of small stores, who offer an important service to communities (Ayala et al. 2017).
7.3 Methods

7.3.1 Study setting

This research was carried out under the umbrella of Food Retail Environments Shaping Health – Intervention toolkit (FRESH-IT), an initiative to accelerate the development of locally relevant solutions to improve retail food environments in smaller, rural and remote jurisdictions in Canada. Northern Health (NH) collaborated as one of three implementation sites across Canada. NH delivers all health services in the northern two thirds of British Columbia, a region that serves approximately 300,000 people. Prince George is the most populous city with a population of 86,622 and is the regional hub for health, social and business services. Approximately one third of the population live in smaller population centres under 10,000, while the remainder live in smaller towns, villages and unincorporated communities, and in Indigenous communities. The largest employment sector across the region is in natural resources, while Prince George has a more diverse economy, including a university, college and major health centre (Howard et al. 2014).

7.3.2 Sample selection

Sample selection was carried out over three phases of the project. In the first phase, we compiled a database of all retail food outlets using an environmental health inspection database that included any facility that sold or prepared food within the health authority boundaries. From this listing, we classified stores according to the North American Industry Classification System (NAICS), the standard used by federal agencies to
classify economic activities. Store addresses were geocoded for all NH Census Subdivisions (CSDs) in a geographic information system package (ArcGIS, 10.6.1).

In the second phase, we worked with the project steering committee to identify a functional region within the broader NH administrative area to conduct primary qualitative and quantitative data collection. A regional approach was taken due to service and employment interdependencies in smaller, rural and remote communities, and to adapt to the large geographic size of the overall region, which includes sparsely populated areas that are inaccessible by road. A regional corridor was selected based on organizational capacity, community mobilization on food issues, and geographic diversity along a major highway corridor (i.e. small population centres, rural areas and Indigenous communities). All stores classified as supermarkets, pharmacies, discount stores, speciality stores and convenience stores within a 50-kilometer radius of a 300-kilometer stretch of the main highway artery were included in the regional case. This yielded 41 stores. The lead author (RH) visited all stores in October 2017 for observations of the food environments. An informational letter on the project that indicated the opportunity to participate in follow-up qualitative interviews was provided to the store owner or manager (see Appendix 7). Contact information was collected from retail operators that expressed interest in the next phase of data collection.

Stores were purposively selected based on classification as a small-or medium-sized grocery store selling at least one item in 50% of categories in the Nutrition Environment Measurement Survey (NEMS-S). We focussed on independently-owned small- and medium-sized stores because of the unique challenges these retailers face providing access to more nutritious foods, and their importance to food access in under-serviced
areas (Pinard et al. 2017; Laska et al. 2018). There were N=9 stores that met these criteria. Storeowners and managers were invited to participate by phone or e-mail.

7.3.3 Data collection

In-depth, semi-structured interviews were conducted with store owners and managers. Informed consent and permission to audio-record the interview was gained prior to starting the interview (Appendix 6). The interview guide in included in Appendix 5. Interviews consisted of questions and follow-up probes in the following content related categories: store owner or manager background; business operations; opportunities and challenges of operating in the broader retail environment; opportunities and challenges posed by the store location; and, indicators of store success. The interview guide encouraged flexibility and allowed participants to describe experiences and share stories that were relevant to them. One of the authors (RH) conducted the interviews in-person in April 2018. Interviews lasted between 45 minutes and 120 minutes. Detailed summaries were written following each interview. These included recorded field notes on the store setting, and an overview of the storeowner background, store history and noteworthy business practices and strategies. The summaries were used to explore emerging themes in subsequent interviews. All study protocols received ethical approval by the University of Toronto Research Ethics board in March 2017.

7.3.4 Data analysis

Interview were digitally recorded and transcribed verbatim in Microsoft Word. Thematic analysis was used to analyze the data (Braun and Clarke 2006). Using this approach, the lead author (RH) began by reading all interview transcripts and case summaries to gain a better understanding of the ideas and concepts in the data. Analytic memos recorded
common patterns, paying attention to sensitizing concepts that were used to develop the interview guide. Further concepts were added using open coding. In other words, rather than using a purely inductive approach that began with open coding and proceeded to conceptualization, analysis followed a deductive then inductive approach. The process generated codes that were entered into Dedoose (version 8.0.42), a computer software qualitative data management program to code all the data and facilitate analysis. Resonance with the emergent themes were assessed across co-authors. Given the aims of this manuscript, we specifically considered codes on business operations, retail practices, and the broader retail, local and regional context.

7.4 Results

7.4.1 Description of the interviewees

Eight store owners and managers were invited to participate in interviews. Two storeowners declined, and another was not available during the period that interviews were being conducted. Interviews were thus conducted with 5 store owners and 2 store managers; one interview involved co-owners of a store. The final sample included the owners of two small general stores, one medium-sized general store, one medium-sized grocery store, and managers of two mid-sized supermarkets. All stores had only one location and were independently operated; one store was independently operated, but a subsidiary of a national chain. The staff employed by the stores ranged from two to 23. All but one store had a point of sale system to track inventory, however several retail operators indicated that they also manually tracked sales, or had distributors/suppliers manage the supply on some items. The number of Stock Keeping Units (SKUs) –or total number of products carried in store –ranged from 4,000 to 20,000.
7.4.2 Retail landscape and local context

7.4.2.1 Types of stores

The business models described by participants do not fit common classifications used for research and statistical purposes. Participants described their stores as ‘in-between’ a grocery and convenience store.

Yeah, it’s funny looking out there, I know, I guess maybe it’s the size of some convenience stores but I think of it as a grocery store, like it’s way bigger than most you know convenience stores would be, like I mean we were, I was looking, my wife was looking actually a couple of weeks ago in [place name] for some businesses for sale in [place name] and she saw a little convenience store that’s for sale, and it’s like just a few shelves and they got those, you know racks like the bread rack we have and you can buy from Costco, and that convenience store had just those as their shelving and they had food on them and she sort of laughed. She said oh that’s a convenience store, like just a tiny place”, I-07-RO

“So, we’re kind of caught between and we’re, we don’t have the luxury of charging convenience store pricing although we’re in that kind of a market, so our margins are really thin that way” I-04-RO

Participants emphasized that being viewed as a convenience store results in a customer expectation of higher prices and less product availability. Participants described several efforts to change how customers view their store, such as how they organize the layout of their store, and offering a greater variety of goods. One owner explained these strategies
as follows: “things like that give that image as well that we’re now a market, we’re not a convenience store.” I-06-RO

7.4.2.2 Competition between retailers

Participants reported changes in the region in the time that they have operated their stores. In the last 15 years, notable changes have included the entrance of low-cost or ‘supercentre’ retailers in two smaller cities, the closure of a chain supermarket that later re-opened under a new subsidiary, and the expansion of non-traditional retailers such as discount stores and pharmacies into the grocery market. Some competition was viewed as healthy for the retail sector, and several stores described how they collectively filled gaps in access during the supermarket closure. As one storeowner expressed about another smaller store:

“they did quite a nice reno, and they updated a lot of their stuff which is good, and we don’t see them as a competitor. We would prefer they stay in business because competition is a healthy thing, and also there’s products that we may never carry that they will carry and vise versa, you know? And so that’s where having more than one business in a small town like this I think is important, you know, it keeps – there’s little checks and balances with your business” I-03-RO

At the same time, participants acknowledged that it was not possible to compete with discount chains, especially with sale offers.

“and so, we’re trying to compete with your – we thought when we got into it our competition would be like the Overwaiteas, Safeways you know, but it turns out our clientele are a little more driven to basics than the fancy food that you will get in those kinds of stores so our competition it turns out is more Real Canadian
Wholesale Club and Walmart. So, and you just, you know to compete with their pricing is really hard so we ended up, although we, you know our pricing is very comparable to the Safeways and the Overwaiteas, people want a different level.”

I-04-RO

7.4.2.3 Regional travel and the role of small stores

Related to how stores are viewed within the landscape of local stores, participants observed that customers are willing to drive longer distances to access chain, discount retailers. Participants described travel as a ‘taken for granted’ part of living in rural, Northern communities, despite the impact that this has on their business practices, especially for smaller stores. Participants described that travel for goods and services that are not available in local communities made trips to larger grocery stores an obvious choice.

“It's not just trying to get different things like the thing is in this town here there's not much to do; right, like we don't have much for clothing, like for groceries okay… but I mean for a lot of people they want to be able to go okay, into Wal-Mart or Costco or Safeway; right, like just go around, walk and then afterwards you know go to a restaurant and then come back to town like they got a lot of money in this town …If you got to do some sort of an x-ray or something or you know see a specialist you got to go to [place name]; right …but I mean if you, for, you know from their point of view okay, well if I'm going to see a doctor I'm going to do my shopping there; right. Something different, right.” I-07-RO

Operators of smaller stores described that people tend to shop at their stores for staple items such as bread, milk and eggs, and for discretionary purchases such as beverages
and chips. For all smaller stores, discretionary purchases and alcohol and tobacco were the most common items sold.

Participants shared that the ability to access these basics locally is what makes a ‘place’ a community. As one participant shared:

“Cause you can’t, to me, we live here now and we’re not the type of people that just want to live in our little ghost town everybody drives by and closes their eyes -- and there’s lots of them now, right? So we decided to buy it and we figured we could do, you know, put a good store together, but a good plan together.” I-01A-RO

7.4.3 Business practices

7.4.3.1 Staple items and competitive pricing

All participants discussed that while they are unable to compete with the deep discounts offered by large format mass merchandisers or supercentres, they try and offer prices that are comparable to regularly priced items at chain supermarkets. Participants were especially attentive to providing comparative prices on household staples such as dairy, bread and some produce items, which they felt should be available within a local community. Participants often spoke at length to how their prices compared to nearby stores, and to the large format stores that people in the region frequent, often providing specific examples of product prices. Several storeowners spoke to the significant impacts that remaining competitive can have on staple items such as milk. As one participant shared:
“but these guys if they're charging $4.89 at Buy-Low for milk I can guarantee you they're paying $4.50, $4.60 and I'm paying $5.39 for a jug of milk. And I'm at $5.49, so I'm making $0.10 even not that if they buy a jug of milk and use a bank card that's $0.11 that debit company charges from us so I'm losing a cent.” I-07-RO

7.4.3.2 Inventory management: Balancing choice, value and profitability

For many storeowners, managing customer’s expectations about product choice and providing competitive pricing means making trade-offs. Participants described a desire to provide greater variety to customers, and to ensure that they don’t run out of certain products. At the same time, they described the losses they experience from spoilage and out of date products if inventory does not turn over. Maintaining this balance is especially difficult with fresh produce, and was also discussed for products low in sugar.

“We try to keep our margins low on the produce so with the intention of having the high turnover, but then if we don’t have the turnover we have the spoilage which basically obliterates everything as far as the potential for profit” I-01B-RO

“The low sugar stuff outdates too soon and we just can’t stock it because it keeps outdating. So, we’re sorry. That’s great that you want to look after your health but we can’t, we just can’t stock it for you. … it just outdates.” I-04-RO

Agreements with suppliers who manage in-store stock and replace or take returns on out-of-date products helps some storeowners manage spoilage issues. Storeowners named more formal arrangements with several multi-national snack food companies and bread companies; those storeowners who had a strong relationship with the independently-run
distributor in the region also described instances where they received credit on other grocery items, but through informal arrangements.

7.4.3.3 Relationships with distributors/suppliers

Closely tied to inventory management, storeowners reported a generally positive relationship with distributors or suppliers. The participants in our study were located along a main highway corridor and described using similar suppliers. While these suppliers were generally major market players, the central location of a distributor who also operates a ‘cash and carry’ supermarket was described by several participants as an important factor to carrying more perishable grocery items and being able to do so consistently.

One participant noted the mutual benefits between stores and suppliers:

“If we’re successful, they’re successful and they really had that great, they were a great support to use when we first came in about helping to build our business and getting exited with us as we built our business, like you know well, cause they were making more money” I-06-RO

In some cases, suppliers and distributors manage store inventory for their products, and provide free products or small incentives for product placement and for in-store promotions. Distributor or supplier involvement in-store was common for bread, beverages and snack items. At the same time, storeowners frequently spoke to how being an independent store allowed them to find the best wholesale prices, and to bring in products from a range of suppliers and distributors.
7.4.4 Retail operator strategies to respond to contextual dynamics

7.4.4.1 Product distinctions

Product distinctions are one strategy that participants deploy to make their store unique, and to attract and retain customers. The most commonly referenced items included specialty or higher-grade meat, and locally-grown and produced items. Several participants described these products as higher quality and providing better value. They also attributed these items to bringing people into their stores.

“R: So yeah, we’re learning, but I would say you had asked me about what product was really bringing people in. I’m going to say out of the local product what’s bringing people in the most is our eggs.

I: People wanting to find –

R: Fresh eggs.” I-06-RO

In the case of local products, a few storeowners spoke to their importance of providing a venue for these producers, and the contribution of these products to building local economies. This was captured by one participant who shared:

“it’s definitely a draw, and it’s not just about, ‘oh look they’re the good guys, they’re supporting local suppliers. No, it’s about building your community’” I-05-RO

In some cases, these items provided valuable revenue streams. A few stores described that they would struggle to remain viable without this revenue, despite the additional time and management that may be required to find unique suppliers.
7.4.4.2 Customer service

The main way that participants distinguish themselves from large format stores was to focus on customer service. Although participants spoke to providing good value, providing good customer service was one area where participants felt they had a competitive advantage.

“And a lot of price sometimes we have a problem competing with even with our buying power how, and what they’re retailing stuff for but they don’t have the bells and whistles, they don’t have the service, they don’t have a lot of those aspects that maybe people are looking for because value and what you go shopping for yourself doesn’t just mean price.” I-05-RO

Good customer service was discussed as especially important for rural areas, where lower population density means a smaller customer base, and a greater need to ensure repeat business. One participant made specific reference to stores in more populated urban centers in discussing the central focus on meeting customer needs in their store:

“If people don’t like your product there’s somebody lined up right behind you to buy. You don’t really care. You know it’s like okay, fine and the buy behind you he’ll buy it. Here, there’s nobody lined up behind them. If they don’t like it, nobody else is going to buy it, so you have to be service, service, service here and that’s one thing we’ve pushed since day one.” I-03-RO

7.5 Discussion

This is one of a handful of papers that examine the business operations and strategies of rural retail operators and provides additional context for understanding the decisions
made by retail operators of smaller- and medium-sized stores. To date, there are few published accounts from rural settings (Abarca and Ramachandran 2005; Pinard et al. 2016), and no Canadian examples. The present study sought to fill a gap through in-depth interviews with retail operators in a rural Canadian setting.

Consistent with the small body of work in rural settings, our findings demonstrate that smaller retailers fulfill an important role, and do so in the context of retail system dynamics that pose challenges to the business model of small, namely rural stores (Pinard 2016; D’Angelo 2017). This work additionally offers a rural perspective to the literature that situates retailer practices across multiple levels of contextual analysis. Our findings depart from the most prominent features raised by urban retail operators, such as household structure and parenting practices, neighbourhood crime and delocalization of decision-making (Gravlee et al. 2014). Instead, we indicate that a core contextual driver is the intersection of retail sector pressures such as competition from large format stores with features unique to rural places, such as an expectation of travel and a smaller customer base. Other studies have reported that dwindling populations, sparsely populated regions, competition with chains in neighbouring towns and declining commercial activity in smaller towns places pressure on the viability of rural and small stores (Pinard et al. 2016; Clarke and Banga 2010). The impact of ‘out-shopping’, or the practice of travelling outside of a local area to shop, on smaller stores has been discussed in several studies (Pinard et al. 2016; Bardenhagen et al. 2017).

As has been reported in other rural research, the small stores owners in this study relied on alcohol and tobacco to attract people to their stores, along with convenience or discretionary foods such as sugary beverages and snack items (Pinard et al. 2016). In this regard, participants were reflexive about how community members perceived their store, and the purpose it serves for community members. At the same time, our results
demonstrate that retail operators use several strategies to set themselves part in a crowded retail sector (Pinard et al. 2016). The strategies are like other rural settings (Pinard et al. 2016), as well as by smaller, independent stores in economically-marginalized urban areas (Khojatesh and Raja 2017). These include product distinctions and providing a more customized and personal level of service than they perceive that discount, large format store models can offer. These strategies can further be understood as a form of ‘health-promoting entrepreneurialism’ (Mah et al. 2017), particularly as it relates to providing a venue for local producers to reach a wider market.

The findings reported here signal several directions for healthy public policy-making to promote healthier environments. Storeowners can be understood as planners of the food environment who implement strategies that respond to external forces. The strategies used by storeowners in this study highlight that they are not just passive respondents to a food system, but actively use strategies to maintain their viability, and which may be mobilized to promote more health-enabling retail environments. We indicate two promising directions for more contextually-oriented research in this regard.

First, our study highlights that retailers are uniquely positioned to contribute to an understanding of contextual influences on retail environments, which has been identified as a priority for elucidating the relationship between environments, behaviors and health outcomes (Fleischhacker et al. 2011; Holsten 2009). Our findings suggest that retailers are embedded in local contexts to which they are keenly attuned, and highly adept at tailoring their practices to place. Capturing their local knowledge into assessments of the consumer and community food environment may help to examine the relative importance of demographic, geographic, socio-cultural and macro-structural factors, the interaction
of these factors, and hypothesized pathways of influence (Larson, Story, and Nelson 2009).

Second, we suggest that retail operators have been underutilized in planning processes to promote healthier retail environments. Our findings indicate that retailers provide an important service to communities, and point to the delicate balance between offering choice, and remaining profitable, for smaller store owners. Involving retailers in healthy public policy-making may help to ensure that interventions do not disrupt existing ‘health-promoting’ practices and capitalize on strategies that retailers already use to promote and sell foods. Much of the discussion of private sector food system actors as public health partners have been through the lens of governance, where concerns have been raised about the influence of private sector interests in initiatives to address unhealthy diets and chronic disease, and the potential loss of legitimacy (Hawkes and Buse 201; Stuckler and Nestle 2012). The hesitations that have been expressed in regard to the role of the private sector in nutrition promotion are not unfamiliar to the healthy public policy conversation. As observed by Nutbeam (2008), the Jakarta Declaration made early attempts to define the terms of private sector co-operation, but public health has remained wary of such partnerships, and the risk that private sector involvement may undermine public health efforts has been subject to significant debate. However, the emphasis on global governance may be less attentive to issues of scale. There are significant differences between the multinational food and beverage companies with substantial influence in the global food system, and smaller retailers who operate at the local-level, and may face a similar ambivalence to that expressed by public health towards global food system actors. More research is required to explore these governance arrangements at the local level, particularly given the convening role that
public sector actors such as public health may play as conveners and enablers of local partnerships.

Finally and relatedly, we point to a predominant focus on ‘health’ as an entry point in qualitative and quantitative studies on retail operators. Recent studies report on storeowner beliefs and practices related to carrying more healthful foods (Andreyeva et al. 2011), barriers and enablers such as stocking and management, sales outcomes, and expectations of consumer demand for healthy items (Kim et al. 2017), and willingness to implement healthy store strategies (D’Angelo et al. 2017). The semi-structured design of our interviews provided an opportunity for storeowners to speak to their perspectives and experiences, rather than probing specifically for practices related to healthier foods. It is noteworthy that health was a marginal topic when using this approach. This aligns with modest discussion of health in retail research outside of the sphere of public health. In a review of small stores in the United Kingdom, issues raised as important to storeowners included operations, consumer relationships, and economic and environmental issues, while health outcomes were not discussed (Clarke and Banga 2010). These results indicate the need to identify alignments between the health aims of public health, and the motivations of retailers. As one example, connecting and stocking food products from local producers was a key strategy for retailers, which may also align with more recent public health attention to food system concerns (Lang 2009). The grocery store plays an integral role in rural communities and rural life, and may hold concurrent roles as economic driver, community building, employer and meeting place (Bailey 2011). Interventions should be considered for how they bolster or impede these outcomes, and where economic, community development and sustainability outcomes may hold purchase for public health (Lang 2009). This approach layers a systems lens onto retailer
research in public health, which has so far focussed on healthy food availability and accessibility.

### 7.6 Study limitations

This study has several limitations. The small sample size was appropriate to the retail food environment intervention planning process in which this study was embedded, however it limits our ability to generalize within the broader region where the public health partner in this research delivers services, and to other small and rural settings. Several of the retail operators who agreed to participate had expressed an interest during environmental observation of the retail environment carried out in an earlier phase of the research, which may mean that those who agreed to participate differ from those who refused, or who did not respond to interview requests. The regional corridor selected for these interviews may differ in important ways from other largely rural regions. A main corridor for goods and services runs between two larger cities in the region, which may mean retail operators have fewer issues with stocking and supplying items than has been described elsewhere. While this was a unique feature of the research, it was justifiable to the research design, which sought to examine contextual features within a broader region selected for retail food environment intervention planning.

### 7.7 Conclusion

This study sought to examine retail operator’s business operations and strategies, and how these are impacted by contextual features. Our findings are consistent with other studies on rural, small-store retailers, however we explicitly bring context as an analytic lens on these results. We indicate opportunities to partner with retail operators to understand retail food accessibility and availability in relation to external factors, and to design locally-relevant solutions. Future research, policy and practice in healthy public
policy-making to promote healthier retail settings is likely to benefit from retailer priorities and perspectives.
7.8 References


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Healthy public policy is a key strategy for creating enabling environments for health. This research directly responds to calls to better account for and integrate contextual considerations in designing population-level interventions relevant to healthy public policy-making. This research is thus based on the assumption that context is important to healthy public policy development and has both empirical and analytic utility. The contributions from the literature on context are uniquely positioned for a multi-disciplinary conversation on context in smaller cities and rural regions by bringing concepts from different philosophies and disciplinary traditions to bear on the real-world, pragmatic practice of decision-making by key institutional stakeholders.

Research on healthy public policy that is taking place in urban settings is not taking place at the same rate in rural Canada. This is an interesting gap, as healthy public policy implies an engagement with ‘place’, however contextual differences of smaller cities and rural regions are largely absent in healthy public policy academic discussions. This is not to imply that population health interventions are not underway in smaller cities and rural and remote communities. To the contrary, research in other areas of health promotion suggests that innovations often happen on the margins of practice, in spite of unfavorable conditions (Poland et al. 2005).

To address this gap, I was embedded in an institutional setting where there was an identified appetite to engage in population-health interventions to promote healthier retail food environments. Through this approach, I was able to surface unique contextual considerations for healthy public policy planning in smaller cities and rural regions. Smaller cities and rural regions differ in important ways from urban settings, which makes context an important component of intervention planning.
Chapter 2 highlighted the ways in which context has been theorized for population health intervention research, as a way to introduce the relevant features and inter-relationships that enable an examination of how context is accounted for in healthy public policy development. In that chapter, I reviewed three major traditions for considering context in public health, which I characterized as geographical or spatial studies on place and health, socio-cultural approaches to consider relations between people and place, and macro-structural views on the (re)production of social spaces. I locate my research in more multi-level approaches which are inspired by these different sources, but also consider the institutional factors which influence how the discrete contributions of each tradition are taken up in how policies are conceived and planned within organizational settings.

Chapter 3 reviewed empirical work on healthy public policy development. I identified that much of this research has occurred in medium-sized cities and larger urban, or metropolitan centres. It is well-documented that smaller cities and rural regions differ from their larger urban counterparts; however, few studies examine healthy public policy planning across these regions. These gaps are also observed in the retail food environment literature, a field of practice in which to actualize healthy public policy development. An empirical focus on retail food environments in Canada’s Provincial North captured the contextual scale needed to address the aim of my research.

Chapter 4 describes a union between community-partnered research and interpretive methodologies as an approach to understand and account for contextual considerations navigated by practitioners. These methodologies informed five distinct phases of research. Results of each phase are discussed in turn in Chapters 5, 6 and 7. A principal contribution of this dissertation research is therefore to link planning processes for retail
food environments to broader institutional processes shaping healthy public policy development in smaller cities and rural regions.

In the following discussion, I consider what the results of my research tell us about healthy public policy development for smaller cities and rural regions. This chapter concludes with directions for future research and practice.

8.1.1 Bridging the research and practice of ‘context’ in population health research

This research was designed to elucidate practice-based knowledge on context through a food retail environment intervention planning process. Both observational and dialogic methods were deployed to surface contextual variables about the retail food environment that could be operationalized in an assessment plan, and which would contribute to the evidence-base for developing future interventions to promote the health of northern BC communities. The methods were effective at surfacing retail store variables, as well as comprehensive demographic, spatial and socio-cultural considerations about how contextual features shape individual responses to retail environments.

The extent to which practitioners grappled with these considerations resonates with calls to better account for and integrate context into healthy public policy-making and population health intervention research (Shoveller et al. 2016; Craig et al. 2018). In my research, practitioners indicated that store-level measures of accessibility and availability may be necessary but not sufficient to determine what interventions would be most appropriate for promoting more health-enabling retail environments in smaller cities and rural regions. Other contextual features were identified as providing greater practical value in this regard. The variables raised by practitioners speak to several characteristics of neighbourhoods and individuals that are discussed at some length in the geographical
literature on place and health (Bernard et al. 2007; Macintyre, Ellaway, and Cummins 2002). A systematic review by Charriere et al. (2010) summarizes contextual variables utilized in retail environment assessment systematic review as “socio-economic indicators (including unemployment rates, a single parent rates, income, race/ethnicity, households without cars), and by other information such as degree of urbanization, rural/urban status, safety, and neighbourhood walkability” (p.1780). Observations from participants in this study on how retail environments may be differentially experienced based on norms, values and routinized values is similarly aligned with a ‘relational’ turn in this field that has not been extensively addressed in the retail environment literature (Cummins et al. 2007; Clary, Matthews and Kestens 2017).

In the retail environment literature, there is room for further development of models that conceptualize the individual, social, environmental and policy factors that influence outcomes (Fleischhacker et al. 2011) and tease apart the relative importance and interaction of these factors (Larson, Story and Nelson 2009). Contextual and multi-level analysis (Holsten 2009) and rich description of stores and their surrounding communities (Gustafson et al. 2013) have been offered as quantitative and qualitative tools to explicate the interplay between individuals, neighbourhoods and food environments.

While promising, data availability, methodological and capacity challenges limited the extent to which multi-level features of local contexts were layered with the retail environment assessment plan co-designed by myself and the NH project team. My experience reinforces the challenges of undertaking this work in rural regions, particularly in a practice-based institutional environment. The asymmetry between how context was theorized at the outset of this project and the eventual implementation of a retail assessment is an important finding of this research, and points to the role of
institutions in how healthy public policies are designed and implemented for smaller cities and rural regions.

The institutional structure for policy formulation has been extensively studied in research on other issue areas in public policy studies (John 2012). Integrative models of context take up institutions in the context/implementation interface (Minary et al. 2018; Craig et al. 2018; Pfadenhauer et al. 2015), but research is not taking place at the same rate as theorization and conceptual development. My findings surface an important tension between the institutional structure and capacity for program and policy delivery in smaller cities and rural regions and settings for implementation. Institutional considerations –specifically regional organization –was a significant focus of my planning with NH partners. It was frequently raised in relation to the ability to collect data on contextual features at scale, and to the ways policy and program interventions could or should be tailored if assessment results indicated relevant differences. The institutional structure of non-urban public health has not been discussed in the healthy public policy literature. While the idea that institutions play a central role in healthy public policy development is not necessarily novel, it has important implications for planning in smaller and rural regions and raises question on how to best develop policy at a suitable scale. These considerations are further elaborated in section 8.1.3.

The large geographic size of the region posed significant institutional capacity issues to collecting primary data on individual and environmental variables for both my research and the partnered health authority alike. Relatedly, secondary administrative data sources that could be used to characterize sociodemographic and economic contexts of urban places, often cover much larger geographic areas in regions encompassing smaller cities and rural areas, due to low population density (i.e. Census Subdivisions). This limits the ability of public health practitioners to report on area-level demographic or spatial
characteristics of specific localities. These limitations could be addressed through increased local data collection and more sophisticated techniques for data analysis (Fuller, Engler-Stringer, and Muhajarine 2016) but in jurisdictions facing state retrenchment and service constraints, these options are often well beyond the capabilities of regional public health institutions to implement. Similar challenges in operationalizing contextual factors in retail environment research in other comparable regions of Canada’s Provincial North (see Skinner et al. 2017) suggest that the methodological limitations of data access and use denote deep structural disparity and capacity challenges for healthy public policy development in smaller cities and rural regions.

The retail food environment assessment generated from this research was scoped for a ‘functional region.’ A functional region reflects the scale of healthy public policy development that is germane to regional and largely ‘non-urban’ health authorities (e.g. a regional municipality or a regional district as the institutional context for policy development for the Northern Region of BC). Data collection and analysis challenges limited my ability to operationalize and conduct a detailed inferential analysis to test practitioners’ hypotheses about pathways between community-level characteristics, retail store variables (e.g. accessibility and availability) and individual purchasing and health outcomes. Instead, in this thesis, I took the approach that defining and measuring store-level variables within a region was a starting point to examine whether contextual features observed by practitioners would result in store-level differences.

The consequence is that it is challenging to establish a dialogue between healthy public policy ‘theory’ and ‘practice’ in smaller cities and rural regions, or, without added investment, to begin to establish an evidence base that would better support population health relevant intervention development.
8.1.2 Evidence to support local planning: What ‘local knowledges’ can contribute to the contextual turn in population health intervention research

Despite the absence of a robust picture of demographic, spatial and socio-cultural contextual characteristics for each community within NH’s administrative boundaries, my thesis results indicate that practitioners are nonetheless highly adept at tailoring programs to local contexts. How can this be the case?

My investigation specifically of retail food environment intervention development surfaced that practitioners identify internal and external partnerships and community development approaches as strategies to contextualize public health problems, program and policies within the structure, culture and everyday practices of their broader organizations (i.e. institutions) and within communities. On the one hand, this could be an artefact of the importance of food security and food systems in public and population health in Canada. On the other hand, however, inter-sectoral partnerships and community engagement are discussed at length in the literature as enabling conditions for healthy public policy development (De Leeuw and Peters 2015). Locating partnership development in the ways that practitioners already account for and integrate intersectorality, as one of their contextual considerations, should be routinely addressed in healthy public policy-making. There has been very little discussion, within the theoretical traditions on context that I could identify for this thesis, on what local knowledge can offer for integrating context into population health planning. Efforts to this end can take inspiration from a considerable body of literature on the role that lay knowledge or expertise can play in policy and program planning, and on the importance of ensuring that health promotion is enacted in ways that are empowering to
communities. These authors support the view that lay knowledge which is rooted in the places people live, work and play can contribute to untangling the complexity of environments, and open up a multitude of explanations for how individuals interact with their environments (Popay et al. 1998). For public health practitioners in this study who serve a very large number of communities, lay knowledge was often brokered through community partners who have a ‘pulse’ on how a community identifies challenges or solutions.

This also raises potential challenges as it relates to retail environments, which are a less familiar domain of practice for public health promoters and nutritionists and their allied partners in the community sector. My results indicate that partnerships with less likely partners (such as retailers) may not be in place to catalyze local knowledges and engage in this interpretive work. This may in part explain an impasse in healthy public policy development specifically targeted at small, rural retail food environments.

Indeed, qualitative interviews with retail operators (Chapter 7) offered insight into how retail settings are embedded in complex community contexts. Interviews with retail operators were useful for exposing how retailers construct context in relation to food availability, price and quality. My findings indicated that retail operators were able to practically manage global economic and food system forces within local community contexts. Like the public health practitioners with the regional health authority, storeowners were adept at tailoring their actions to place, and demonstrate a tacit and experiential knowledge of the contextual features of communities where they operate their stores. This introduces the possibility that limited differences between stores in my food environment analysis may also be a result of practices of retail operators, who attempt to address inequities in food access based on their knowledge of locale. Like public health practitioners, retailer operators may attempt to ‘smooth out’ retail sector
pressures that may otherwise lead to less availability or variety, albeit for reasons of maintaining a stable consumer base. For example, while public health practitioners expected that there would be differences between the availability and variety of fruits and vegetables between smaller stores and larger supermarkets, my research found no association for these grocery products. The strategies retail operators deploy to maintain the viability of their store also suggest that they may be attuned to mechanisms that mediate or moderate relationships between food environments and individual-household choices. The latter are also hypothesized by public health researchers, potentially providing a bridge for further work with retailers that taps into their knowledge.

The strategies and operations of retail operators have begun to receive more attention in the retail environments literature. The focus of these studies has largely been on retail operators’ perceptions of, and willingness to implement, healthy store strategies (Andreyeva et al. 2011; D’Angelo et al. 2011; Martinez et al. 2018; Kim et al. 2017), or ways in which existing operations may support or hinder interventions (Ayala et al. 2012). A smaller number of studies examine retail operators views about local communities, or consider how retailers’ strategies may be a response to contextual factors (Gravlee et al. 2014). Instances of ‘positive deviance’ by retail operators may indicate adaptive solutions to local environments (Khojasteh and Raja 2017; Mah et al. 2017).

My thesis extends the evidence base on smaller and medium-sized retail operators as potential public health partners rather than simply the objects of interventions (Gittelsohn 2010; Song et al. 2007; Song et al. 2011). There is an identified need to bridge between a store’s existing role in the community, and nutrition promotion aims (Langellier et al. 2013), and retailer buy-in is fundamental to that process. My results indicate that retail operators may also be uniquely positioned between the global food system and local
community dynamics in a way which can provide insights into theoretical models of contextual influences that link food environments to the health of populations. In this way, advancing partnerships between regional practitioners and retail operator allies may be one avenue to contextualize store-level variables within broader dynamics that are difficult to quantify in light of data and analytic limitations often faced by practitioners in small cities and rural regions tasked with intervention planning and design.

8.1.3 Healthy Public Policy in smaller cities and rural regions: Working across scales

Another theme in my thesis findings was the centrality of scalar challenges to healthy public policy development in smaller cities and rural regions. The practices of practitioners and retail operators surface the negotiation of scale within and across institutions, localities and settings, as a prominent part of the planning context. For practitioners within Northern Health, their administrative boundaries overlap with local, regional and provincial entities. As one example of this administrative arrangement, the area included within the ‘functional region’ includes five cities, towns, villages and district municipalities, several First Nations communities, and two regional districts. It is from this position that practitioners approach the task of healthy public policy development, and for this reason that institutional arrangements may be a central feature in understanding how and why healthy public policy happens, or where barriers to policy development may arise.

Retail settings are bounded to localities, but similarly situated within multi-scalar governance structures, and, as demonstrated in this research, more distal retail sector dynamics. A major highway though the region means that residents are in dynamic interaction across localities. Retail environments within a functional region therefore
have flows of inputs, outputs and throughputs of people, resources and ideas all
dynamically interacting at multiple scales which are both a product of, and contributor to,
the regional context.

A functional region illustrates the connection points between systems and may be a
unique way for identifying leverage points for enabling innovation and population health
initiatives that are reflective of the ways people live, work and place within a regional
reality. There is limited precedence for addressing scale in the public health literature
(Buse, Smith and Silva 2018). The lack of development of regional policy within public
health is not entirely surprising, as regional policy development is also a relatively new
discussion within rural and regional planning, where regions are the central foci of study
(Barca, McCann and Rodríguez-Pose 2012; Rodríguez-Pose 2013). While this literature
is namely focused on economic policy, developments in this field may be informative for
rural and regional healthy public policy-making. In a highly influential paper, Barca,
McCann and Rodriguez-Pose (2012) raise the point that global socio-political transitions
require a shift by governments and international organizations from more dominant
‘space neutral’ to less utilized ‘place-based’ policies. Proponents of place-based
approaches argue “globalization has made localities and their interaction more important
for economic growth and prosperity” (p. 136, McCann and Rodriguez-Pose 2012). The
place-based approach assumes that geographic, social, cultural and institutional context
matter, and that ‘space neutral’ policies may be undermined without explicit attention to
their spatial interactions and effects. While pointed towards international development
policy, the future for regional development outlined by these authors hew closely to the
main findings of my research. To tailor investments and interventions, policy
development requires place-specific knowledge, participatory processes with actors
embedded in place to generate that knowledge, and a strengthening of formal and
informal institutions to gather evidence, convene actors and implement change (Rodriguez-Pose 2013).

8.2 Implications for research, policy and practice

This dissertation makes several contributions to the substantive, methodological and theoretical literature on healthy public policy. Substantively, this research offers an applied example of healthy public policy-making in two under-researched areas, smaller cities and rural regions, and retail food environments. Theoretically, I apply a multi-level view of context to shed light on both the institutional environment for policy-making, and the factors that are important to interrogate in retail food environments as settings for healthy public policy. Methodologically, I linked interpretive policy analysis to the study of context and use experiential and applied knowledge surfaced through interpretive methods to tailor measurement to practitioner’s applied and experiential experience with context.

The overarching themes discussed in this chapter signal future areas for integrative research, policy and practice in the area of healthy public policy-making to promote health-enabling retail environments. These include, but are not limited to: (1) tools and approaches for measuring the role of context in intervention design, measurement and evaluation (theory and methods); (2) regional healthy public policy intervention; and (3) governance of healthy public policy interventions.

8.2.1 Public health research: Tools for measuring context

The findings from this research support that multi-stakeholder engagement can be employed to identify contextual considerations that may impact intervention planning in retail environments. Incorporating observations from actors with a stake in retail environments (e.g. public health practitioners, retail operators and local governments,
among others) into future studies on smaller and rural retail environments can address evidence gaps in a way that is relevant to individuals who practice in that space. Several features raised by practitioners through observational and dialogic methods were not incorporated into the retail food environment measurement conducted for this research. Further research is required to qualitatively and quantitatively assess the hypothesized mechanisms between food retail environments and individual behaviors and health outcomes, such as travel patterns and modalities, and socio-cultural norms around food. Population health planning in small and rural communities would benefit from research that tests these assumptions to develop appropriate policy and program responses. Further research on factors that are engendered by a functional region will additionally develop the utility of this approach for non-urban research.

For this research, I was embedded within the planning process, which allowed for closer observation of how context is taken up within institutional settings and provided additional support to the project partner. I used my previous background as a public health practitioner as an active tool to identify questions, conduct the research and analyze my data. My familiarity with navigating the practice of public health generated data that respond to theory-driven questions, but also address the ‘real world’ decision-making of practitioners. The results presented in this dissertation are situated at the intersection of theory and practice and reflect my unique role in the research.

The nature of my research indicates that public health units may require partnerships with researchers to measure retail environments, while researchers would benefit from tools to more rapidly assess what evidence will prove most fruitful for practitioner decision-making. A potential next step using data from this research may be to consider a model or tool for identifying multiple levels of analysis that impact on retail environments that could be used in research/practice partnerships. Appraisal tools such as
Rapid Assessment Procedures, Rapid Rural Appraisal and other approaches may be more practical for meeting research and practice timelines than the more intensive interpretive approach used for my study.

8.2.2 Public health practice: Partnerships for healthy public policy

There is strong support in this work for the importance of partnerships for gaining traction on healthier settings. Retail operators are central figures in retail interventions, however have been a less likely partner in community health conversations. The strategies employed by retailers in this study suggest that bringing retailers into the conversation around issues such as business improvement, community economic development, or local food systems may be more attractive than nutrition promotion goals. This is aligned with healthy public policy-making, which is focused on cross-sectoral action to meet public health aims.

Deliberative and participatory processes that involve public health, local governments, the community sector and business stakeholders may be particularly beneficial to identify retail operator’s existing strategies that align with nutrition promotion goals, and opportunities to leverage these strategies into broader population-level interventions. These processes draw on public health’s strength as a convener and enabler in healthy public policy-making processes. Identifying programmatic, policy or funding initiatives that support aligned strategies would be a useful outcome of this work, particularly for actions that are fledgling due to lack of time or resources in retail stores.

8.2.3 Public health policy-making: Regional measurement and intervention

This research points to regional measurement and intervention as the most appropriate scale of interventions and policy-making in this area of Canada’s Provincial North. Place-based versus place-neutral policy-making is still an emerging area of research in
regional policy studies. In Canada, smaller towns and rural regions often have limited local government representation or administration. As such, policy is most often developed at the Provincial or Federal level, with limited consideration for place-based impacts. Retail food environments cross many sectoral and jurisdictional boundaries, although the most commonly applied policy levers are typically at the local level. Next steps for regional policy-making should consider municipal, regional, provincial and federal policies that impact on retail environment regions, which is aligned with practice-based strategies. Specifically, exploring sector and jurisdictional regulations and legislation may identify synergies or possibly areas for healthy public policy at a regional scale.

8.3 Conclusion

My research examined healthy public policy-making for smaller cities and rural regions in an applied example of retail food environment intervention planning. I applied context as a conceptual tool to understand the unique features of smaller and rural localities that impact on efforts to promote healthier environments. I found that institutions, settings and communities are organized according to the regional connectedness of smaller cities and adjacent rural regions, which has implications for healthy public policy-making in Canada’s Provincial North. Regional connections engender contextual features that are important to measure and understand, but capacity challenges in public health as well as retail practice limit data collection and evidence use at this scale. Existing strategies such as partnerships and community-engagement planning utilized by public health practitioners should be preserved. Additionally, new partnerships with retail operators are needed to identify contextual priorities for future action. Retailers business operations and strategies to maintain the viability of their stores demonstrate a tacit understanding and response to contextual factors and are a form of local knowledge that can be
deployed by stakeholders seeking to implement changes in retail environments. A multi-sectoral, regional approach may be most appropriate to interventions in smaller and rural communities.
8.4 References


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Appendices

Appendix 1. Project Terms of Reference

FRESH-IT Northern Health Case Study Proposal

A. Background: Food Environments and Health

The retail food environment is an expanding area for population health nutrition practice and research, and interventions have gained momentum over the last decade. Food environments are defined as the types and geographic distribution of food stores in a given community or region, the features of the environment such as availability, affordability and quality of healthy foods, and the consumer and informational environment in stores. Food environments are a key contributor to dietary quality and health status over and above individual knowledge, preferences and behaviors. Food retail environment interventions usually aim to improve geographic access to healthier options as well as to increase availability and consumer appeal of fresh produce and in stores. The National Collaborating Centre for Environmental Health (NCCEH) has identified four prevailing types of food environment interventions as the local level: (1) urban planning/land use instruments; (2) food retail transformations; (3) public sector purchasing/procurement; (4) information transparency (e.g. menu labelling).

Measuring the food environment is one step to developing effective and contextually appropriate retail food interventions (Health Canada 2016, webinar on manual available [here](http://example.com)). Food retail assessment typically involves mapping the location of food retailers, and then layering additional information relevant to the local context (e.g. socio-demographic and health data, measures of cost and availability, modes of transportation, etc.) The scope of the assessment is guided by available resources, relevancy to local context, and the types of actions that are possible within the local policy context.

Food environment assessment research and practice in rural and remote Canadian communities is a nascent field, with much of the evidence for action coming from the United States, where spatial and other dynamics may differ from the Canadian context. There is a significant opportunity to capture relevant and sustainable measures of food access and security in Canadian jurisdictions to produce locally-relevant program and policy responses.

B. FRESH-IT (Food Retail Environments Shaping Health Intervention Toolkit)

FRESH-IT is a CIHR-funded knowledge to action food retail environment research project. The overarching goal of the project is to accelerate the development of evidence informed, testable and local population health interventions in Canada, to improve access to healthier foods in the retail food environment. FRESH-IT will guide municipal development of a retail food environment intervention through three toolkit components. These have been built from previous research and through collaboration with Health Canada Office of Nutrition Policy and Promotion (ONPP) and other partners. The toolkit includes an evidence application guide on food retail interventions, food environment assessment manual, and policy readiness guide.
Four communities across Canada, one each in NL, ON, MB and BC (tentative) have been selected as pilot groups for this project. Each community is represented on a Regional Champion Group by a local practitioner champion. Several other communities are part of the FRESH-IT network through their participation in a Health Canada food environment assessment pilot. The anticipated outcome of implementing FRESH-IT in each jurisdiction will be a pilot retail food environment intervention and evaluation plan with input from decision makers and broad-based support. FRESH-IT will support jurisdictions to identify funding supports for implementing the plan.

FRESH-IT aligns with Northern Health’s strategic priority to support healthy people in healthy communities by (1) conducting retail food environment assessment in partnership with communities, and with municipal and small business stakeholders to contribute data on the health needs and assets of Northern communities and (2) developing evidence-informed food retail interventions that promote healthy community environments.

C. FRESH-IT Northern Health Site

Northern Health Authority has been invited to be the BC site for FRESH-IT, which will be supported by a PhD candidate based in Northern BC who is a research member on the FRESH-IT project team. Along with contributing to FRESH-IT objectives, the BC site will additionally serve as a case study for Ms. Hasdell’s PhD thesis on the role of context in food retail environment assessment.

The BC case study will be co-developed by the Northern Health regional champion and Ms. Hasdell with input from key stakeholders at Northern Health (e.g. Food Security lead, Public Health Epidemiologist, Healthy Communities/Healthy Built Environments Collaborative). Key activities will include taking stock of existing food system assessment work already done in the region and collecting complementary food measurement data, as well as convening existing and new stakeholders relevant to the food retail environment in order to determine the types of data that should be collected, collaboratively interpret assessment results, and identify opportunities for intervention. These activities will support a detailed design for a proposed intervention and associated evaluation plan, and will additionally pilot measures that will lay the groundwork for the ongoing collection of contextually-relevant food access information for Northern BC.

The diversity of food environments in the Northern BC region will make a significant contribution to the food retail environment literature by emphasizing the unique opportunities and challenges (for example, remoteness, low local food production, environmental events and one road-in towns, among others) of Northern rural and remote communities.

D. Partner Expectations

FRESH-IT Project Team

- Offer technical support on food environment assessment and intervention from team members with expertise in policy readiness and stakeholder engagement (Dr. Catherine Mah) and food environment assessment (Dr. Leia Minaker)
- Provide small grants (up to $20,000) to support stakeholder engagement and food environment assessment

PhD Candidate (Rebecca Hasdell)
• Co-lead and manage the project with the Northern Health regional champion, and serve as a liaison with the FRESH-IT research team
• Provide technical support on food environment assessment, including presentations to key stakeholders at Northern Health and other partners as required
• Lead data collection and stakeholder engagement, maintaining ongoing communication with Northern Health regional champion and key stakeholders at Northern Health

Northern Health Regional Champion
• Co-lead and manage the project within the region with the local FRESH-IT research team member (Rebecca Hasdell), and serve as a liaison with the FRESH-IT research team
• Advocate for the project within the region, including identifying a reference group of key stakeholders at Northern Health
• Actively participate in scheduled Regional Champion Group meetings (approximately every 6 weeks from April 2016 to April 2017), or send regrets in advance if needed
• Attend an end of project meeting in St. John’s, NL, for which travel expenses will be covered by the project
• Have the opportunity to participate in specific publications led by the research team

E. Deliverables

Rebecca Hasdell
• Conduct food retail environment assessment
• Deliver assessment findings and report on retail food environment, including recommendations for ongoing food access measurement in the North
• Identify food retail and intervention plan in a regional municipality in collaboration with Northern Health, based on stakeholder engagement and assessment results

Northern Health
• Complete a brief reporting tool every 3 months
• Complete a written final report on the regional project with information
• Lead intervention activities identified through assessment and intervention planning
Appendix 2: FRESH-IT Workshop Facilitation Guide

Agenda and Facilitators Guide, FRESH-IT Workshop

1) Session objectives
2) Detailed session agenda
3) Vignettes, Vignettes aims, Facilitator prompts
1) Session objectives

a. Session objectives (from proposal)

(1) Outline the relevance of retail food environments to Northern Health's strategic aims, and provide an overview of retail food store access across the Northern Health region.
(2) Identify criteria to select settings, communities (or regions) for community-level data collection.
(3) Determine what data should be collected to inform policy or program interventions to address food access in selected communities (or regions).

b. Introduction for participants

What: Food accessibility and availability, which are just two components of the food environment, influence northern eating decisions and, ultimately, health. Lack of food access has been raised in consultations as an important issue for Northern communities.

So what: The goal of FRESH-IT is to conduct an assessment of the food environment in Northern Health Region to develop interventions that are tailored to community needs. This workshop is one part of understanding food environments in the Northern Health region.

Now what: The outcome of this workshop will be an assessment plan that incorporates the information you need the most to identify food environment concerns and develop northern responses.

2) Detailed session agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Key tasks</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 minutes</td>
<td>Welcome</td>
<td>• Roll call – who is on the line, what is their interest in the topic</td>
<td>Flo, Marianne, or Holly</td>
</tr>
</tbody>
</table>
| 15 minutes| Introduction | • Recap of FRESH-IT  
                      • Purpose of session (see above)  
                      • Review structure of session (two activities, each get you thinking in a different way about the food environment)  
                      • Key terms to get everyone on same page (what are food environments, why matter for health, how different that other food interventions, what can be done) | Rebecca                   |
3) Workshop Activities

Facilitator script: Vignettes are based on a collection of experiences our team has doing food retail environment interventions, and a way to think about what we could do here in Northern BC. I will read the vignette, but you will also see it projected on your screen. I will then lead us through several questions. I invite you to think about your experience working and living in the Northern region when responding to the vignettes.

a. Vignette 1

Case: Developing a strategic plan - Demonstrating rationale for intervention

Sara works for Food First Saskatoon, a not-for-profit food security organization. Sara is supporting the organization’s senior leadership and board to develop their 5-year strategic plan. Food First Saskatoon has experience supporting community food programs (like community gardens and community kitchens) in Saskatoon and surrounding towns, but Sara knows from Provincial food costing that retail food availability and cost are concerns in some communities.

Sara has a short timeframe to gather information to develop the Strategic Plan, and knows that without demonstrating the need for such a focus with concrete data, her organization is unlikely to expand their focus to the retail food environment. Sara knows from other projects that there are considerable differences between the communities where her organization works.

Questions:

1. What aspects of the food environment should Sara use to demonstrate the need for such an intervention?
2. How should she go about collecting this type of information? What types of measures and calculations should she use?
3. What strategies should Sara use to build the most compelling case to her organization to expand their focus to the retail food environment?
Prompts
- In what ways do your proposed measures align or differ from data that is currently collected?
- What would be different about this measure than current data sources?
- How broad or targeted should data collection be?
- What is the best way to engage (stakeholders, community members, retail operators, municipalities, etc.)?
- How have the strategies worked elsewhere?

b. Vignette 2

**Rallying support for a proposed Good Food Box program**

Carol works for the Health Authority in Alberta. She is working on an initiative to improve the food system in Mackenzie County in the Province’s northwest corner. She has been working with the Municipal Government, Dene Tha First Nation, Beaver First Nation, Tallriver First Nation and Little Red River Cree Nation to address food system challenges. Community leaders have identified that they are most concerned about the high cost and poor quality of store foods.

Carol believes based on feedback from communities and the experiences she’s heard of in other jurisdictions that a Good Food Box (GFB) program is a viable solution. Carol knows that she will require strong support from communities and from frontline and senior leadership in her organization to support a good food box program.

Questions:

1. To build a compelling case, what information should Carol collect?
2. What should Carol do next with her results? How should this information be presented to ensure the greatest chance for support from project stakeholders?

Prompts:
- In what ways do your proposed measures align or differ from data that is currently collected?
- What would be different about this measure than current data sources?
- How broad or targeted should data collection be?
- What is the best way to engage (stakeholders, community members, retail operators, municipalities, etc.)?
- How have the strategies worked elsewhere?
Appendix 3. Participant observation and workshop consent form

**The role of context in food retail environment interventions**

Principal Investigator: Rebecca Hasdell, PhD candidate  
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Research Sponsor: Canadian Institute for Health Research Doctoral Research Award

**Purpose:** Thank you for your interest in this doctoral research entitled: ‘The role of context in food retail environment interventions’. The retail food environment is an increasingly popular setting for policy and program interventions because of its potential to support healthy diets and improve population health. However, the role of context in intervention outcomes remains relatively unexamined, especially in smaller Canadian jurisdictions. This research is part of a larger project called FRESH-IT (Food Retail Environments Shaping Health Intervention Toolkit), a knowledge to action project to accelerate the development of evidence-based, locally relevant food retail interventions in small- and medium-sized cities. It will also be used to identify which features of context matter most for food retail interventions more broadly.

**Study Procedures:** With your permission, information shared during this workshop and observations by the researcher will be used to inform analysis for this doctoral research.

**Potential Risks and Benefits:** This research will contribute to the development of a food retail environment assessment and intervention plan for the Northern Health Region. It is not likely that there will be any harms or discomforts nor direct benefits to you associated with your participation.

**Confidentiality and withdrawal:** Information collected during the learning session will be used for FRESH-IT project implementation. Potentially identifiable information related to FRESH-IT project implementation may be included in project reports. Your information will not be identifiable as part of the analysis conducted for this doctoral research, or resulting publications in academic journals or conference publications. Throughout the duration of the study all recorded data will be locked in a secure location (e.g. physical materials will be stored in a locked filing cabinet and digital files
will be kept on the principle investigators personal computer in a password protected file), and will be destroyed five years after the end of the study.

Data may also be reviewed for quality assurance to make sure that the required laws and guidelines are followed. If chosen, (a) representative(s) of the Human Research Ethics Program (HREP) may access study-related data and/or consent materials as part of the review. All information accessed by the HREP will be upheld to the same level of confidentiality that has been stated by the research team.

Your participation in this doctoral research is entirely voluntary, and you may withdraw from using the information you provide through your participation with FRESH-IT for research purposes. Please note that your choice to withdraw will not influence your future relations with the FRESH-IT project team, Memorial University, the University of Toronto or the Canadian Institute for Health Research.

**Contact for concerns about the rights of research subjects:** This research study has been approved by the Research Ethics Board at the University of Toronto. If you have any concerns about your treatment or rights as a research subject, you may contact the University of Toronto Office of Research Ethics at ethics.review@utoronto.ca or 416-946-3273.

**Contact for information about the study:** If you have any questions about this study or would like further information, please contact the principal investigator Rebecca Hasdell at 647-865-0426, or rebecca.hasdell@utoronto.ca. You may also contact Dr. Catherine Mah, PhD supervisor, at catherine.mah@utoronto.ca, or 709-864-4939

**Acknowledgement.** Your contribution is important to the completion of this project. Thank you for your participation. Should you wish to receive a written summary of the main results of this research, please add your preferred contact information below.

Your signature below indicates that you have received a copy of this consent form for your own records and that you consent to participate in this study.

____________________________________________________
Participant Signature          Date

____________________________________________________
email address          phone number
Appendix 4. Public health practitioner, community organization, local government interview guide

1) Let’s start with your role at [organization]?
   - How did you get into working on food issues?
   - How does this work connect with other work you’ve done in the past?

2) Tell me about the type of work that [organization] is involved with related to the food environment? (follow-up on projects discussed during previous phases)
   - What projects stand out?
   - Where are you working?
   - In this project, we’ve been thinking very specifically about retail environments such as grocery stores, convenience stores, or other places people buy food? What connections do you see between retail environments and your role at the [organization]?
   - Have you engaged with this sector? What’s challenging or what are the barriers to doing that type of work?

3) Thanks for sharing a bit about your organization. I’m going to change directions slightly and shift gears to thinking beyond your organization, to people who live, work and travel in the Northwest.
   - How well do you think the retail food environment is working for businesses in this area? What are things that make it work? What are the challenges?
   - How well do you think the retail food environment is working for people in this area? What are the things that make it work? What are the challenges?
   - What types of policy or program supports would address some of those gaps or challenges?

4) The final piece we’re interested in are how different characteristics of this region impact on the food retail environment. Are there things about the Northwest that make food access (or the food environment) here unique or different?
   - Prompt: In previous conversations, you’ve mentioned ...
   - For example, others have talked about issues such as how big Northern BC is, economic pressures in the region, and the ‘pull’ of bigger cities like Prince George and Terrace as challenges for both people and businesses in a community. Have you experienced these challenges, and are there other things like this that either help or hinder your ability to run a store here?

5) Is there anything else you’d like to add that we haven’t talked about?
Appendix 5. Retail operator interview guide

1) Let’s start with the story of how you got started in this business

- What attracted you to working in food retail?
- How long have you owned/managed the store?
- Who ran it before you?
- What do you like most about your job?
- What is most challenging about the work that you do?

2) This next set of questions gets at the day to day of operating your store so that I can get a sense of the logistics of running a store in [name of community]

 Suppliers/Stocking (Start with the items in your store)

- How do you decide what items to carry (What goes into that decision-making)? What is most popular, or most important for getting people in the doors? Most profitable? What brings people in the store?
- Who are your main suppliers? For what items?
- How do you decide on suppliers? Do you have agreements with them? (e.g. incentives)
- Have you had any trouble finding suppliers or negotiating terms for items you stock?
- What do you do if you can’t find someone to supply something? (e.g. buy from Costco)? Does this make it difficult on your bottom line?
- Do you manage food suppliers differently than the other items you carry?
- How do you handle receiving of shipments?
- How do you keep track of what you have in store? (POS system?)

 Customers and community (Now that I have a sense of what you carry, would like to know more about the role your store plays in the community)

- Who tends to shop at your store? Who do you see most often?
- What’s the main reason they shop here?
- Do people ask you to carry certain items (has that influenced what you bring in)?
- One thing we’ve been thinking about is people’s access to fresh, healthy foods. Are those types of items popular in your store? Have you done anything to promote them?

 Other operations

- Do own the building, or do you lease the space? Is this your building, or do you lease the space?
- Did you start out with all this equipment (like the fridges, cooler)? If you see a need or opportunity, how do you make those changes?
- Employees? Do you do your own bookkeeping?
So reflecting on everything that you’ve shared with me so far, if we’re thinking big picture about your store over the long term ... 

- What does success mean for you in the context of running this business?
- What changes would you make to your store if there were no limits on your ability to make a change (like money, staff, etc)?
- Is there a time you have seen a gap or a challenge, and responded to it?
- What kind of support would you need to make those changes (e.g. from your local government, the community, public health, suppliers, etc.)
- Who do you think would benefit most from these changes?

3) Thanks for sharing the details about your store. I’m going to change directions slightly and shift gears to thinking beyond your store, to people who live, work and travel along this corridor.
- How well do you think the retail food environment is working for businesses in this area? What are things that make it work?
- How well do you think the retail food environment is working for people in this area?

4) The final piece we’re interested in are how different characteristics of this region impact on the what you carry and how you run your store food retail environment. Are there things about the Northwest that make running a store here unique or different?

- For example, others have talked about issues such as how big Northern BC is, economic pressures in the region, and the ‘pull’ of bigger cities like Prince George and Terrace as challenges for both people and businesses in a community. Have you experienced these challenges, and are there other things like this that either help or hinder your ability to run a store here?
  - Prompt for features they have mentioned in the interview

5) Is there anything else you’d like to add that we haven’t talked about?
Appendix 6. Retail Operator Consent Form

The role of context in food retail environment interventions

Principal Investigator: Rebecca Hasdell, PhD candidate
Dalla Lana School of Public Health
University of Toronto
Health Sciences Building, 155 College St., room 588
Toronto, ON, M5T 3M7
Telephone: (647) 865-0426
Email: rebecca.hasdell@utoronto.ca

Research Sponsor: Canadian Institute for Health Research Doctoral Research Award

Purpose: Thank you for your interest in this PhD research project entitled: ‘The role of context in food retail environment interventions’. The retail food environment is an important part of food access for communities, and a popular setting interventions to promote healthier diets. However, the role of local factors in shaping retail food environments has received limited attention, especially in smaller, rural and remote Canadian communities. This research is part of a larger project called FRESH-IT (Food Retail Environments Shaping Health Intervention Toolkit), a knowledge to action grant to develop evidence-based, locally relevant food retail interventions in small- and medium-sized cities.

Study Procedures: You have been asked to take part in an interview that will last between 45 and 60 minutes. If you agree the interview will take place in person, at a time that is convenient for you, and in a place that ensures your privacy. With your permission, the interview will be audio-recorded and transcribed. Following the interview, you will have the option of checking the transcript of the tape-recording (at your request, a copy of transcripts will be mailed to you).

Potential Risks and Benefits: It is not likely that there will be any harms or discomforts nor direct benefits to you associated with your participation.

Confidentiality and withdrawal: All information collected during the interview will be kept strictly confidential, and only this researcher and her thesis committee will have access to raw data. Northern Health Authority is a knowledge user for this project, and will receive information on overall findings. Throughout the duration of the study all recorded data will be locked in a secure location (e.g. physical materials will be stored in a locked filing cabinet and digital recordings and files will be kept on the principal investigators personal computer in a password protected file) and will be destroyed five
years after the end of the study. The findings from this study may be published in reports or academic journals, and presented at conferences. You will be identified by your involvement in food sector (e.g. business owner, supplier, municipal planner, community organization representative) and the type of organization you work for (e.g. private sector, public sector, civil society). However, transcription of your interview will not contain identifying information about your organization, and you will not be identified by name in any reports from the completed study. Your employer will not have access to the data or the information that you provide.

Data may also be reviewed for quality assurance to make sure that the required laws and guidelines are followed. If chosen, (a) representative(s) of the Human Research Ethics Program (HREP) may access study-related data and/or consent materials as part of the review. All information accessed by the HREP will be upheld to the same level of confidentiality that has been stated by the research team.

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time. Please also note that your choice to participate will not influence your future relations with Dalhousie University, the University of Toronto, or the Canadian Institute for Health Research.

**Contact for concerns about the rights of research subjects:** This research study has been approved by the Research Ethics Board at the University of Toronto. If you have any concerns about your treatment or rights as a research subject, you may contact the University of Toronto Office of Research Ethics at ethics.review@utoronto.ca or 416-946-3273.

**Contact for information about the study:** If you have any questions about this study or would like further information, please contact the principal investigator Rebecca Hasdell at 647-865-0426, or rebecca.hasdell@utoronto.ca.

**Acknowledgement.** Your contribution is important to the completion of this project. Thank you for your participation. Should you wish to receive a written summary of the main results of this research, please add your preferred contact information below.

Your signature below indicates that you have received a copy of this consent form for your own records and that you consent to participate in this study.

____________________________________________________
Participant Signature                                      Date

_____________________________________________
email address (optional)              phone number (optional)
Appendix 7. Store Informational Letter

October 3, 2017

Dear Store Manager:

There is interest in our community of improving health by promoting healthier lifestyles. The FRESH-IT (Food Retail Environments Shaping Health – Intervention Toolkit) project is looking at how the food environment influences what people eat. A group of researchers from across Canada are measuring the options that are available in smaller and rural communities, especially in grocery and convenience stores. As part of this project, we are visiting stores in the Northwest Region of British Columbia to look at average food availability and pricing.

We are not inspectors or evaluators, and we are not connected with your competitors. As researchers, we follow strict rules to protect the confidentiality of the information we collect. We will assign an identification (ID) number to your store, and only the research staff will see your individual information. Any data collected will be aggregated to show the overall picture of food access in the region. This will support collaborators such as the Northern Health Authority to plan for how they can support communities to promote healthy eating.

We may follow up with you at a later date to talk more about the opportunities and challenges you see regarding food access in your community.

If you have questions or concerns, please contact Rebecca Hasdell at (647) 865-0426, or by email at rebecca.hasdell@utoronto.ca.

Thank you for allowing us to spend a few minutes in your store to record this information.

Cover Page

Rater ID: ____________ RSN: ____________ Date: ____________

Store Address: ____________________________________________

Store type: ○ Supermarket ○ Grocery or general store ○ Discount store ○ Convenience store ○ Pharmacy ○ Specialty store (ethnic food store; butcher, etc)

Number of aisles with ultra-processed foods (i.e. chips and candy) or sugar sweetened beverages: ____________

Are candy, chips, chocolate bars, gum, and/or pop near the cash? ○ ○

Are any vegetables or fruits near the cash? ○ ○

Are baskets or shopping carts available? ○ ○

On a scale of 1 – 5, please rate the following by circling:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cleanliness</strong></td>
<td>Very dirty</td>
<td>Slightly dirty</td>
<td>Average</td>
<td>Generally clean</td>
<td>Very clean</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Very dark</td>
<td>Slightly dark</td>
<td>Average</td>
<td>Generally well-lit</td>
<td>Very well-lit</td>
</tr>
<tr>
<td><strong>Crowding</strong></td>
<td>Very crowded</td>
<td>Slightly crowded</td>
<td>Average</td>
<td>Generally spacious</td>
<td>Very spacious</td>
</tr>
</tbody>
</table>

Are **local** items being promoted? ○ ○

__________________________

222
### Nutrition Environment Measures Survey (NEMS-S-NH) Measure #1: **Fruit**

Rater ID: □ □
RSN: □ □ □ □ □ □
Date: □ □ □ □

Are fresh fruits available in store: □ Yes □ No

#### Availability, Price, Quality

<table>
<thead>
<tr>
<th>Produce Item</th>
<th>Available</th>
<th>Price</th>
<th>Unit</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes   No</td>
<td>$</td>
<td>lb   kg  pint pc pk</td>
<td>A  UA</td>
<td></td>
</tr>
<tr>
<td>1. Bananas</td>
<td>O      O</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bunch)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Apples</td>
<td>O Gala  O</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Loose)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Oranges</td>
<td>O Navel O</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Loose, large)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Grapes</td>
<td>O Red Seedless O</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bunch)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Blueberries</td>
<td>O  O</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Smallest pkg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Strawberries</td>
<td>O  O</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Smallest pkg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Cantaloupe</td>
<td>O O     $</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Additional types of fresh fruit available: □ 0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6+

Measure Complete □
**Nutrition Environment Measures Survey (NEMS-S-NH) Measure #2: Vegetables**

Rater ID: [ ]

RSN: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]
### Availability, Price, Nutrition Information

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<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Nutrition Information</th>
<th>Fat</th>
<th>kcal</th>
<th>Sodium</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Whole wheat bagel</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Package of 6)</td>
<td></td>
<td>Whole package of 6, weight:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Whole wheat English muffin</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Package of 6)</td>
<td></td>
<td>Whole package of 6, weight:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Muffins (6-pack)</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>e.g., chocolate chip, carrot, or banana</em></td>
<td></td>
<td>Whole package of 6, weight:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Choose items where nutritional information is available, if possible*
<table>
<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Size of loaf</th>
<th>Price of loaf</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole grain bread (100% whole wheat bread and whole grain bread)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 100% whole wheat (Wonder)</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fresh baked/homemade whole wheat</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White bread (bread made with refined flour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. White bread (Wonder)</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Fresh baked/homemade white</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. TOTAL # of varieties of ALL bread loaves available (including baguettes):
0 0 1 0 2 0 3 0 4 0 5 0 6+
# Nutrition Environment Measures Survey (NEMS-S-NH) Measure #5: Fresh and Frozen Meats

**Rater ID: | | | | | | RSN: | | | | | | Date: | | | | | |**

## Availability, Price

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Price</th>
<th>Unit</th>
<th>Quality</th>
<th>Fresh/Frozen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ground beef</td>
<td>Lean</td>
<td>O</td>
<td>O</td>
<td>$</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>(Smallest package)</td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

| 2. Chicken thighs     | Maple Leaf Prime        | O         | O     | $    | O       | O            |
| (Smallest package)    | Other                  | O         |       |      | O       | O            |

| 3. Pork chops         | Center cut bone-in     | O         | O     | $    | O       | O            |
| (Smallest package)    | Other                  | O         |       |      | O       | O            |

| 4. Fish fillets       | Seaquest               | O         | O     | $    | O       | O            |
| (Sole, Halibut, Basa, or cheapest available) | Other                | O         |       |      | O       | O            |

---

Measure Complete | |
# Nutrition Environment Measures Survey (NEMS-S-NH) Measure #6: Processed Meats

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Price</th>
<th>Unit</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hot dogs</td>
<td>Maple Leaf</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Package of 12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*NOT BBQ SIZE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Chicken nuggets</td>
<td>Maple Leaf</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Smallest package)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Fish sticks</td>
<td>High Liner</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Smallest package)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Sliced ham</td>
<td>Maple Leaf</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(175 g package)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Beef jerky</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(80 grams, regular package)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*choose cheapest brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measure Complete |
### Nutrition Environment Measures Survey (NEMS-S-NH) Measure #7: Meat Alternatives

**Rater ID:** [ ]  
**RSN:** [ ] [ ] [ ] [ ] [ ]  
**Date:** [ ] [ ] [ ] [ ] [ ]

## Availability, Price, Quality

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Item size</th>
<th>Price per</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Canned Tuna</td>
<td>O Clover Leaf</td>
<td>O O</td>
<td>g</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
<tr>
<td><strong>Flaked light in water</strong></td>
<td>O Other _______</td>
<td>(170 g can, if available)</td>
<td>*choose cheapest of Ocean’s, Clover Leaf, or Gold Seal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Canned Salmon</td>
<td>O Clover Leaf</td>
<td>O O</td>
<td>g</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
<tr>
<td><strong>Wild pacific, in water</strong></td>
<td>O Other</td>
<td>(213 g can, if available)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Yellow split peas</td>
<td>O North Star</td>
<td>O O</td>
<td>g</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
<tr>
<td><strong>(Smallest pkg)</strong></td>
<td>O Other _______</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Kidney Beans</td>
<td>O Unico</td>
<td>O O</td>
<td>mL</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
<tr>
<td><strong>Other _______</strong></td>
<td>O Other _______</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Private label</strong></td>
<td>O O</td>
<td></td>
<td>g</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
<tr>
<td><strong>Regular Option: Peanut butter (made with added sugar)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Peanut butter</td>
<td>O Kraft</td>
<td>O O</td>
<td>g</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
<tr>
<td><strong>Smooth, 500</strong></td>
<td>O Other _______</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Private label</strong></td>
<td>O O</td>
<td></td>
<td>g</td>
<td>$</td>
<td>O O</td>
<td>__________</td>
</tr>
</tbody>
</table>

Measure Complete [ ]
### Nutrition Environment Measures Survey (NEMS-S-NH) Measure #8a: Milk, Eggs

**Rater ID: [blank]**  
**RSN:** [T E R]  
**Date:** [blank]

#### Availability, Price

<table>
<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Size</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Skim milk</td>
<td>O O</td>
<td>L</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
<tr>
<td>2. 1% milk</td>
<td>O O</td>
<td>L</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
<tr>
<td>2. 2% milk</td>
<td>O O</td>
<td>L</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
<tr>
<td>3. Whole milk</td>
<td>O O</td>
<td>L</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Size</th>
<th>Quality</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Powdered milk</td>
<td>O _______</td>
<td>O O</td>
<td>g</td>
<td>O O</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
<tr>
<td>5. Evaporated milk</td>
<td>O Carnation</td>
<td>O O</td>
<td>mL</td>
<td>O O</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Eggs</td>
<td>O Daybreak</td>
<td>O O</td>
<td>$1.1</td>
<td>_________________</td>
</tr>
</tbody>
</table>

(Dozen, large, white)  
O Other _______
## Nutrition Environment Measures Survey (NEMS-S-NH) Measure #8b: Cheese and alternatives

### Availability, Price

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Package size (weight)</th>
<th>Price</th>
<th>Unit</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Cheddar cheese</td>
<td>Cracker Barrel</td>
<td>O</td>
<td>g $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(450g package)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Medium, orange)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Pre-sliced cheese</td>
<td>Cracker Barrel</td>
<td>O</td>
<td>g $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(240 g package)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Medium, orange)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Deli cheese</td>
<td></td>
<td>O</td>
<td>g $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Sliceable, medium, cheddar, orange)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. 2% Yogurt</td>
<td>Astro</td>
<td>O</td>
<td>g $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Plain, 175 g container)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Cheese slices</td>
<td>Kraft singles</td>
<td>O</td>
<td>g $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Processed cheese slices)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Yogurt, sweetened</td>
<td>Activia</td>
<td>O</td>
<td>g $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Strawberry, stirred)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(&lt;20 g sugar/30 g. serving)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Nutrition Environment Measures Survey (NEMS-S-NH) Measure #9: Frozen Vegetables & Fruit

Rater ID: | | | | | | RSN: | | | | | | Date: | | | | | |

### FRUIT
**Availability, Price**

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Package size (weight)</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frozen Strawberries</td>
<td>Europe’s Best</td>
<td>O Yes</td>
<td></td>
<td>$</td>
<td>per package</td>
</tr>
<tr>
<td>(4-mixed field berry)</td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Private label</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. TOTAL # of varieties of frozen fruit with no additives available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Are any LOCAL frozen fruit options available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Are canning supplies available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### VEGETABLES
**Availability, Price**

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Package size (weight)</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frozen Green peas</td>
<td>Green Giant</td>
<td>O Yes</td>
<td></td>
<td>$</td>
<td>per package</td>
</tr>
<tr>
<td>(Use smallest package)</td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Private label</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. TOTAL # of varieties of frozen vegetables with no additives available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Are any cut up vegetable options available?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measure Complete | |
Nutrition Environment Measures Survey (NEMS-S-NH) Measure #10: Frozen and prepared meals

Rater ID: [___]  RSN: [_______]  Date: [______/______/______]

Availability, Price, Nutrition Information

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Nutrition info per</th>
<th>Fat</th>
<th>kcal</th>
<th>Sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Single serve frozen dinner**

1. ____________  O Michelina’s  O  O
   (NAME OF MEAL)  O Other ______
   (Regular option, not sodium or fat reduced)

   Package weight  [_______] g  Price $ [____] per package

**Healthier Option** (< 9 g fat/226-311g OR < 500mg sodium/226-311 g)

1. ____________  O Michelina’s  [____] g  [____] g  [____] kcal  [____] mg _________
   (NAME OF MEAL)  O Other ______

   Package weight  [_______] g  Price $ [____] per package

**Family size frozen dinner, Pepperoni pizza**

2. ____________  O Delissio  O  O
   (NAME OF MEAL)  O Other ______

   Package weight  [_______] g  Price $ [____] per package

**Single serve deli sandwich**

2. ____________  O  O
   (choose sliced whole wheat, added vegetable, lean meat)

   Package weight  [_______] g  Price $ [____] per package

Measure Complete
# Nutrition Environment Measures Survey (NEMS) Measure #11: Canned Vegetables & Fruit

**Rater ID:** [Blank]

**RSN:** [Blank]

**Date:** [Blank]

## FRUIT
### Availability, Price, Quality

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Can Size</th>
<th>Available</th>
<th>Price</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Peaches</td>
<td>O Del Monte</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Halves in juice)</td>
<td>O ________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Use 398mL, if avail)</td>
<td>O Private label</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
</tr>
</tbody>
</table>

Available packed in water with no added sugar? O O

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Can Size</th>
<th>Available</th>
<th>Price</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Pineapple</td>
<td>O Dole</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Slices in juice)</td>
<td>O ________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Use 398mL, if avail)</td>
<td>O Private label</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Can Size</th>
<th>Available</th>
<th>Price</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. TOTAL # of varieties of canned fruit (regular)?:</td>
<td>O 0 O 1 O 2 O 3 O 4 O 5 O 6+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. TOTAL # of varieties of canned fruit (packed in water, no added sugar)?:</td>
<td>O 0 O 1 O 2 O 3 O 4 O 5 O 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## VEGETABLES
### Availability, Price, Quality

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Can Size</th>
<th>Available</th>
<th>Price</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tomatoes</td>
<td>O Aylmer</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Whole)</td>
<td>O ________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Use 796mL can if available)</td>
<td>O Private label</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
</tr>
</tbody>
</table>

Available canned with no added salt? O O

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Can Size</th>
<th>Available</th>
<th>Price</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Green Peas</td>
<td>O Del Monte</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Use 284mL if avail)</td>
<td>O ________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Private label</td>
<td>mL</td>
<td>O O</td>
<td>$</td>
<td>O O</td>
<td>________</td>
</tr>
</tbody>
</table>

Available canned with no added salt? O O

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Can Size</th>
<th>Available</th>
<th>Price</th>
<th>Quality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. TOTAL # of varieties of canned vegetables (regular)?</td>
<td>O 0 O 1 O 2 O 3 O 4 O 5 O 6+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. TOTAL # of varieties of canned vegetables (no added salt)?</td>
<td>O 0 O 1 O 2 O 3 O 4 O 5 O 6+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Nutrition Environment Measures Survey (NEMS) Measure #12: Chips

**Rater ID:**  
**RSN:** T E R  
**Date:** 1 0 1 7  

### Availability, Price, Nutrition Information

**A. Availability**  
1. Total variety of chips:  
   - 00  
   - 01  
   - 02  
   - 03  
   - 04  
   - 05  
   - 06  
   - 07  
   - 08  
   - 09  
   - 010+  

**B. Pricing** (All items must be same brand)  

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Price</th>
<th>Package weight</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **1. Regular chips**  
(180g pkg preferred) | O Lays Classic  
O Other | $ |  | g |  |
| **2. Popcorn**  
(136 grams, plain, salted) | O Boom Chika Pop  
O Other | $ |  | g |  |

Measure Complete

235
Nutrition Environment Measures Survey (NEMS) Measure #13: Beverages

Availability, Price

A. Variety of options
1. Are 100% juice options available?  
   Yes  No
2. Are low-calorie or zero calorie sport drink options available? (*e.g.: Gatorade G2, Powerade Zero)  
   Yes  No
3. Are diet or low-calorie pop options available? (*e.g.: Coke Zero, Pepsi)  
   Yes  No
4. Are water enhancers available? (*e.g. Mio)  
   Yes  No

B. Pricing

<table>
<thead>
<tr>
<th>Item</th>
<th>Brand</th>
<th>Available</th>
<th>Bottle/carton</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar-sweetened beverages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Fruit beverage</td>
<td>O Sun Rype</td>
<td>O O</td>
<td>mL</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>(cocktail)</td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Sports drink</td>
<td>O Powerade</td>
<td>O O</td>
<td>mL</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Regular pop</td>
<td>O Coke</td>
<td>O O</td>
<td>mL</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>(Choose 2L if possible)</td>
<td>O Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measure Complete
Nutrition Environment Measures Survey (NEMS) Measure #14a: Cereal

Availability, Price

<table>
<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Package size (grams)</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAKFAST CEREAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Look for medium size box (NOT family size)

Whole grain cereal $\leq$ 8 g sugar and greater than/equal to $\geq$ 4 g fibre per 30g serving

*EXAMPLES whole grain cereals

*Plain Cheerios, All Bran Original, Weetabix, Shredded Wheat*

1. O Plain Cheerios O O [ ] [ ] [ ] g $[ ] . [ ]$ per package __________________________
O Other __________

TOTAL # of varieties of whole grain cereals: O 0 O 1 O 2 O 3 O 4 O 5 O 6+

Sugar sweetened cereals $\geq$ 7 g sugar and greater than equal to $\leq$ 2 g fibre per 30g serving

*EXAMPLES of sugar sweetened cereals:

*Fruit Loops, Honeycombs, Lucky Charms, Frosted Flakes, Cinnamon Toast Crunch, Cap’n Crunch, Corn Pops*

2. O Honey Nut Cheerios O O [ ] [ ] [ ] g $[ ] . [ ]$ per package __________________________
O Other __________

TOTAL # of varieties of sugar-sweetened cereals: O 0 O 1 O 2 O 3 O 4 O 5 O 6+

Measure Complete [ ]
Nutrition Environment Measures Survey (NEMS) Measure #14b: Rice and Pasta

Rater ID: [ ]
RSN: [ ] [ ] [ ]
Date: [ ] [ ] [ ] [ ]

Availability, Price

<table>
<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Package size (grams)</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RICE**

1. O Minute Rice Brown [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________
   (Smallest package)
   O Other __________

TOTAL # of varieties of whole grain/brown rice:
[ ] [ ] [ ] [ ] [ ] [ ] [ ]  O 0 1 2 3 4 5 6+

2. O Minute Rice White [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________
   (Smallest package)
   O Other __________

TOTAL # of varieties of white rice:
[ ] [ ] [ ] [ ] [ ] [ ] [ ]  O 0 1 2 3 4 5 6+

**PASTA**

1. O Catelli WG or WW [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________
   (Smallest package spaghetti)
   O Other __________
   O Private label [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________

TOTAL # of varieties of whole grain/whole wheat pasta:
[ ] [ ] [ ] [ ] [ ] [ ] [ ]  O 0 1 2 3 4 5 6+

2. O Catelli White [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________
   (Smallest package spaghetti)
   O Other __________
   O Private label [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________

TOTAL # of varieties of white pasta:
[ ] [ ] [ ] [ ] [ ] [ ] [ ]  O 0 1 2 3 4 5 6+

3. O Kraft Macaroni and Cheese [ ] [ ] [ ] [ ] $ [ ] [ ]  per package __________
<table>
<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Brand</th>
<th>Package size (grams or ml's)</th>
<th>Price</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Canola oil</td>
<td>O O</td>
<td>Mazola</td>
<td>ml</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(500 ml)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Margarine</td>
<td>O O</td>
<td>Becel</td>
<td>gr</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(non-hydrogenated 427 grams)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Light Margarine</td>
<td>O O</td>
<td>Becel</td>
<td>gr</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(non-hydrogenated 427 grams)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Flour, white</td>
<td>O O</td>
<td>Robin Hood</td>
<td>gr</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(1 kg)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Flour, whole wheat</td>
<td>O O</td>
<td>Robin Hood</td>
<td>gr</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(1 kg)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Salad dressing, Ranch</td>
<td>O O</td>
<td>Kraft</td>
<td>ml</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(475 ml)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Vinegar, white</td>
<td>O O</td>
<td>Heinz</td>
<td>ml</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(1 L)</td>
<td></td>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Coffee</td>
<td>O O</td>
<td>Nacob</td>
<td>gr</td>
<td>$ 1.1</td>
<td>________</td>
</tr>
<tr>
<td>(Ground, 350 grams)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>