

**Investigation of the Implementation and Perceived Impacts of a Mobile Produce Market in  
Disadvantaged Communities**

**Evelyn Jane Platts**

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Faculty of Social Sciences  
University of Ottawa

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## Abstract

Food insecurity is a major public health problem in Canada. Community interventions are a growing response to addressing food insecurity. Mobile produce markets, which bring fresh produce to disadvantaged communities, are an example of such interventions. A mobile produce market called the MarketMobile was developed by Ottawa's Anti-Poverty Project and Coalition of Community Health and Resource Centres and implemented in four communities in Canada's National Capital Region in 2014 with the purpose of addressing gaps in the availability of healthier foods. This dissertation consists of two research papers investigating the implementation and perceived outcomes of this program from both participant and stakeholder perspectives. Two studies using surveys, document review, and semi-structured interviews were conducted at the beginning and end of the program's pilot period. The first study was an investigation of the implementation of the program during its pilot period. Findings from this study suggested that the program was well-received by participants but that there were inconsistencies in implementation. The second study explored perceived program outcomes. Findings from this study suggested that the program positively influenced participants, their communities, and stakeholders; however, some negative experiences were identified. Overall, it appears that while the MarketMobile was well-received and holds promise for addressing some contextual issues related to food availability, it has limited capacity to address food insecurity. Implications for future programming and policy are discussed.

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## General Introduction

Diet quality is related to a variety of health outcomes (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). Diets low in nutrient-dense foods and high in high-energy, low nutrient foods (e.g. “junk” food) have been linked to poor health outcomes such as heart disease, type II diabetes, and certain types of cancers (Afshin et al., 2019). These types of diets have also been associated with increased risk for overweight and obesity which, in turn, are associated with poor physical and psychosocial health outcomes, such as increased mortality, low self-esteem, and increased risk for discrimination (Janssen, Craig, Boyce, & Pickett, 2004; Katzmarzyk & Ardern, 2004). Preventable diet-related illness is a significant burden on the Canadian health care system, costing billions of dollars in direct and indirect costs per year (Chronic Disease Prevention Alliance of Canada, 2017; Lieffers, 2018). There is wide consensus that consuming a diet rich in fruits and vegetables is related to better health outcomes for most people, yet many Canadians fall short of the Canada Food Guide recommendations for fruit and vegetable consumption (Black & Billette, 2013).

In recent decades, there have been major changes in food consumption patterns among people in Western nations. These changes include an increase in meals prepared and eaten outside the home, increased intake of sugar-sweetened beverages, and increased consumption of fast food (Rosenheck, 2008; Story et al., 2008; Wang, Bleich, & Gortmaker, 2008). For example, between 1970 and 2000, there was an 86% increase in the consumption of soft drinks in the United States among adults and an 18% increase in the number of calories from foods prepared and consumed outside the home (Powell, Nguyen, & Han, 2012; Vartanian, Schwartz, & Brownwell, 2007). These behaviours, among others, are hypothesized to contribute to inadequate nutrition and poor health outcomes.

## **Factors Influencing Diet**

Individual level factors, such as, demographic characteristics, knowledge, attitudes, and behaviours, and an innate liking for sweet and fatty foods, have been extensively researched as contributors to poor diet quality and related health outcomes. These factors are insufficient, however, to explain disparities in diet quality and health outcomes that are observed across socio-economic and racial lines (Neff, Palmer, McKenzie, & Lawrence, 2009; Kumanyika et al., 2000; Sallis & Glanz, 2009; Torrance, Hooper, & Reeder, 2002). This focus on individual factors does not consider the influence of the larger context in which people live and behave. This context may promote or constrain behaviours that lead to positive health outcomes. Social and environmental factors, such as socio-economic status, place of residence, availability of healthy food, the cost of food, and social norms (e.g. what others are eating and learned eating behaviours), may also contribute to decisions about food shopping and dietary practices (Satia, 2009; Neff et al., 2009).

An ecological perspective is appropriate for understanding factors that influence health-related behaviours. The ecological perspective examines health-related behaviours from different levels and posits that considering health-related behaviours, and outcomes, from only one level is insufficient (Story et al., 2008). Bronfenbrenner (1979) originally conceptualized ecological systems theory as a way of understanding human development. His model describes environmental influences from the following: 1) The microsystem comprises all aspects of the environment in which an individual directly participates (e.g. within a family, at a recreation centre, in neighbourhood); 2) The mesosystem describes links between different microsystems (e.g. the link between a family and a community program); 3) The exosystem includes domains in which an individual is not actively participating (e.g. a person's food choices may be

influenced by the interaction between a community program and a funding agency); and 4) The macrosystem includes cultural context (e.g. such as beliefs, values, attitudes, norms, policies).

This model makes several assumptions. First, it assumes that individuals exist within a larger context that comprises multiple levels of influence. Second, levels are considered in relation to each other and they cannot be separated and understood in isolation because they influence each other. Third, it assumes that change at one system level will mean change in another system level. This is a useful model for conceptualizing the levels of influence on food access. Specifically, individuals operate within many systems that influence their food related behaviours.

Many researchers have adopted an ecological perspective to better understand food access and eating behaviours. They posit that the built environment (i.e. the physical structures within an environment such as grocery stores, restaurants, and convenience stores) may contribute to individual health outcomes and dietary practices by influencing factors related to food access (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). They have primarily examined how the proximity and density of food retailers in an environment relate to individual health outcomes. Some researchers have conceptualized the food environment as inclusive of the overarching economic, political, and social influences on food production and distribution; however, few studies have examined how these systems interact to influence access to food at an individual level (Carter, Dubois, & Tremblay, 2013).

### **Food Security and Diet**

The term food security has been defined in many ways over time (Maxwell, 1996). Food security refers to the ability to obtain enough healthy food in safe and socially acceptable ways which, in turn, contributes to adequate nutrition and ability to eat a healthy diet (Burns, Jones, &

Frongillo, 2010). One reason why people face barriers to consuming healthy foods is that they are food insecure. Food insecurity is a major public health concern in Canada, and it is estimated that one in eight households are food insecure (Tarasuk, Mitchell, & Dachner, 2016). Household food insecurity refers to the inability to access enough nutritious, safe, and culturally appropriate food in socially acceptable ways due to financial constraints (World Health Organization, 2004; Loopstra & Tarasuk, 2015), such as poverty (Sriram & Tarasuk, 2016). Living in poverty is the primary predictor of food insecurity; however, not all food insecure people are living on low income (Sriram & Tarasuk, 2016). This suggests that while lack of income constrains people's ability to obtain food, other factors contribute to food insecurity. For example, after controlling for income, having Aboriginal status, being a home renter rather than owner, and lone parent female-led household are all related to higher vulnerability to food insecurity (Tarasuk, Mitchell, McLaren, & McIntyre, 2013).

Food insecurity is strongly related to mental health difficulties. The risk of poor mental health outcomes increases with increasing severity of food insecurity (Tarasuk et al., 2013; Jessiman-Perreault & McIntyre, 2017). Household food insecurity is associated with mental health challenges such as inattention and hyperactivity in children (Melchior et al., 2012). Additionally, there are long term consequences of food insecurity; living in a food insecure household in childhood increases later risk of depression and suicidal ideation (McIntyre, Williams, Lavorato, & Patten, 2012; McIntyre, Wu, Kwok, & Patten, 2017). Mental illness can make it more difficult for people to become food secure, and food insecurity can make it more difficult for people to manage their health conditions (Lent, Petrovic, Swanson, & Olson, 2009). This places a burden on our health care system (Tarasuk, Cheng, de Oliveira, Dachner, Gundersun, & Kurdyak, 2015; Tarasuk, Cheng, Gundersen, de Oliveira, & Kurdyak, 2018).

Household food insecurity is also associated with poorer physical health outcomes for both adults and children. The risk of chronic health conditions increases with an increasing severity of food insecurity, leading to a consequent increase in the burden on the healthcare system (Vozoris & Tarasuk, 2003). It is more difficult for people to manage chronic health conditions, such as diabetes and HIV, when they are food insecure (Chan, DeMelo, Gingras, & Gucciardi, 2009; Anema, Vogentahler, Frongillo, Kadiyala, & Weisser, 2009). People with limited resources may have to make choices about where to allocate their resources and sacrifice medications.

### **The Built Environment and Diet**

Consistent with ecological models that emphasize the interplay between the environment and the individual, it has been hypothesized that people who have better geographical access to supermarkets and grocery stores will have healthier diets and better outcomes, but the research on this association is mixed. Areas with poor access to healthy food have been called “food deserts” (Cummins & Macintyre, 2002).

In the United States, food deserts have been identified as a public health issue, since poor diet is linked to poor health outcomes, such as diabetes, hypertension, and obesity. When access to supermarkets and healthy fresh produce is limited, individuals in these communities often shop at convenience stores, where food is generally less healthy, higher fat, and more expensive (Larsen & Gilliland, 2009; Rose & Richards, 2004). Convenience store use has been associated with increased purchasing of less healthy foods (D’Angelo, Suratkar, Song, Stauffer, & Gittelsohn, 2011). Some research from the United States suggests that the presence of healthful food options in stores is positively related to intake of such foods (Bodor, Rose, Farley, Swalm, & Scott, 2008). Additionally, people who live in economically disadvantaged and predominantly

African American neighbourhoods generally have poorer access to supermarkets, which has been identified as an important risk factor for unhealthy diet (Beaulac, Kristjansson, & Cummins, 2009; Cummins & Macintyre, 2005; Cummins, Flint, & Matthews, 2014). Although some research suggests that supermarket access improves diet (Larsen & Gilliland, 2009), several other studies have found that, while introducing new grocery stores into communities improves people's perceptions of food access in their community, it does not significantly increase consumption of fruits and vegetables (Cummins et al, 2005; Cummins et al., 2014; Dubowitz et al., 2015). This could be because grocery stores also carry a variety of other foods, which people may be purchasing instead of fruits and vegetables. Additionally, stores may not market produce or offer incentives for purchasing it. Outside of the United States, there is little evidence demonstrating that the presence of food retailers in communities varies by level of neighbourhood socio-economic status (Beaulac et al., 2009) and the relations between presence of food stores, food prices, and diet are mixed (Gustafson, Hankins, & Jilcott, 2012).

In Canada, the evidence for the existence of food deserts is equivocal. Some cities in Canada have been identified as having food deserts. In London Ontario, residents living on low income who live close to the city centre have the poorest access to major grocery stores (Larsen & Gilliland, 2008). In a study of food access in Gatineau, Quebec, higher material deprivation was associated with better geographic access to food retailing; however, 7.5% of the population live in areas classified as having poor accessibility (distance to the nearest grocery store >1.4km) (Gould, Apparicio, & Cloutier, 2012). Food access and food insecurity is a major problem in northern Canada, where the high cost of food and the high cost of living constrains residents' food access. One review investigating the existence of food deserts and areas with higher geographic access to food retailers selling less nutritious foods such as convenience stores and

fast food restaurants (labelled “food swamps” by the researchers) found that generally, in urban areas, supermarket and grocery store access in socio-economically deprived areas was comparable or better than access in advantaged areas. (Minaker, Shuh, Olstad, Engler-Stringer, Black, & Mah, 2016). Future research should investigate the types of foods sold in these settings, particularly as these retailers are often labelled as being healthy or unhealthy and that labelling this is done somewhat arbitrarily. These mixed findings could be due to differences in definitions and methodologies used to study the food desert construct.

In the United Kingdom, findings are mixed in studies examining associations between the presence of food stores, individuals’ diets, or fruit and vegetable intake. Some research has not found consistent differences between poorer and more affluent areas in terms of food price, availability, and food access (Cummins & Macintyre, 2005; Pearson, Russell, Campbell, & Barker, 2005; Macintyre, Macdonald, & Ellaway, 2008). Shop type has been found to predict price and availability of foods (Cummins & Macintyre, 2002). In Scotland, food was no different in price or was a bit cheaper in poorer areas than in more advantaged areas and, unlike in the United States, a higher presence of food stores was found in poorer areas in the UK (Cummins & Macintyre, 1999; Macdonald, Ellaway, & Macintyre, 2009). This is consistent with some research from the Netherlands, in which increased proximity to food stores was associated with increased neighbourhood deprivation (van Lenthe, Brug, & Mackenbach, 2005).

In England, few low-income consumers reported problems using supermarkets despite transportation difficulties or perceived problems in choice of shops or fruits and vegetables (Dibsdall, Lambert, Bobbin, & Frewer, 2003). In Northern Ireland, consumers who used small stores in their neighbourhood paid more for food (Furey, Farley, & Strugnell, 2002) but did not

report that travelling far distances to supermarkets at the edges of town was a problem (Furey, Strugnell, & McIlveen, 2001).

In Australia, research suggests that there is no difference in shopping infrastructure for fruits and vegetables based on socio-economic differences (Winkler, Turrell, & Patterson, 2006). Additionally, after controlling for income, few differences in fruit and vegetable purchasing patterns between households in socio-economically advantaged and disadvantaged areas have been found (Turell, Blakey, Patterson, & Oldenburg, 2004).

Thus, outside of the United States, it does not appear that there is an association between types of food retailers and level of economic deprivation in a given neighbourhood. This is not to suggest that the food environment is unimportant; rather, there may be different cultural, social, and governing systems that have implications for local food environments, including how food is distributed, bought, and consumed in different countries (Cummins & Macintyre, 2005).

According to Cummins and Macintyre (2005), in the United States, there appears to be more neighbourhood separation based on socio-economic and racial factors than in the UK, Glasgow, or Australia. These researchers provide the following explanations for why this may be the case. First, planning and regulatory policies may not account for this in the United States. Land pricing and city planning may influence the food environment. For example, in Glasgow, more supermarkets are available in poorer areas, which tend to be outside of the city centre, and this could be because land price is lower in these areas. Second, social phenomena such as “spatial reordering” may have implications for the local food environment (Cummins & Macintyre, 2005). In the United States, people with higher income have been more likely to move out of the city. This trend has slowed in certain areas in the United States, but some cities may be affected by this reordering such that lower income people now have different exposure to neighbourhood

environmental risk. The food available in stores in lower income areas in the United States may cost more because of higher perceived risk of doing business in these areas (Cummins & Macintyre, 2005). Examining why food deserts may exist in some countries but not others is beyond the scope of this research, but it is informative to consider systemic influences on the food environment, food behaviours, and their implications for food security interventions.

### **Rural Food Access and Diet**

Most research on food access and diet has been focused on urban areas. In the United States, rural living has been associated with lower consumption of fruits and vegetables as well as a higher risk of nutrition linked chronic disease when compared to urban living (Calancie, et al., 2015). Rural residents may face unique barriers to accessing a range of healthy and affordable food which may disproportionately impact their health.

Rural dwellers live near relatively few grocery stores and rural food retailers may offer fewer options than those in larger centres (Bardenhagen, Pinard, Pirog, & Lazarus Yaroch, 2017). Healthier options may be more expensive when compared to those in urban areas (Bardenhagen et al., 2017). Rural residents have unique transportation barriers, such as longer commutes and higher transportation costs which may leave fewer resources for accessing food (Dean & Sharkey, 2011; Fleischhacker, Johnson, Quinn, Pitts, Byker, & Sharkey, 2013). A study of women's experiences in rural Canada found that these women perceived challenges with transportation and a lack of employment opportunities in their communities, which were perceived as barriers to food access (Buck-Mcfadyen, 2015). Reliance on personal vehicles and costs associated with this, as well as long commutes and a lack of public transportation may place an added burden on rural dwellers, particularly if they experience low-income. Despite these difficulties, rural dwellers have described strengths of living where they do, such as

feelings of social cohesion and trust and strong networks in which they share resources (Buck-McFadyen, 2015).

Limited research has been conducted on food access opportunities and obstacles in rural communities or with rural residents. This is problematic because strategies to improve food access in urban communities may not be as feasible or effective for rural residents. Rural communities have unique qualities that can be built upon to address their food-related needs. Including rural residents in efforts to address challenges related to food access, rather than simply implementing programs that work in urban contexts, is important to develop strategies that maximize and build upon their assets (Fleishhacker et al., 2013).

There is evidence to suggest that dietary quality and health outcomes may be influenced by the proximity, density, and type of food retailers in a community. Some of these studies suggest that individual outcomes are related to inadequate food access at a community or neighbourhood level. Considering this, improvements in individual dietary practices and health outcomes may result from interventions that are implemented at a community level. The existence of food deserts in Canada is contested and studies of this topic are limited by methodological challenges. Despite this, obtaining enough food and eating a diet rich in fruits and vegetables remains a challenge for many Canadians. The research in this dissertation will examine an intervention aimed at improving these difficulties.

### **Responses to Food Insecurity**

As a response to the hypothesis that increased access to food improves diet and health, a variety of initiatives have been implemented to improve access to food in low-income communities with limited geographic access to food. These programs have been developed primarily to improve availability, affordability, and distribution of food within communities but

often have other goals such as expanding social and economic opportunities for community residents and businesses (Bellows & Hamm, 2002). These programs are often referred to as community food security initiatives. Community food security exists when all community members can obtain enough food through sustainable and just systems (Hamm & Bellows, 2003; Andrée, Langille, Clement, Williams, & Norgang, 2016). It includes the promotion of community autonomy, resident well-being, and social justice activities (Hamm & Bellows, 2003).

### **Food security interventions: Charitable and alternative models**

People who are food insecure have reported using many coping strategies, such as budgeting, taking loans, reducing the amount of food they eat, and seeking social support, to manage food insecurity and hunger for themselves and their families (Power, Small, Doherty, & Pickett, 2018). People may also access institutional efforts that exist to address hunger.

Institutional efforts to improve access to food and food security were initially done through charitable models (e.g. food banks and soup kitchens) and are intended for emergency situations and short-term alleviation of hunger. Although these types of interventions are widespread, they are not without limitations (Roncarolo & Bisset, 2015). For example, they fail to address the underlying causes of food insecurity and often have limited capacity to sustainably address food insecurity (Wakefield, Fleming, Klassen, & Skinner, 2012). It has been argued that charitable models do not adequately meet the needs of users, are associated with feelings of shame among users, and that there is disconnect between the services offered and user preferences, cultural issues, nutritional adequacy, and geographic location (e.g. the services are where the volunteers are, not where the need is) (Tarasuk & Eakin, 2003; Tarasuk et al., 2014; Poppendieck, 2002; Loopstra & Tarasuk, 2012). Additionally, charitable models of food provision bring up important

moral considerations. Some researchers argue that reducing factors like food insecurity that lead to hunger should be the responsibility of the government and that charitable models promote the idea that hunger is being adequately addressed. (Roncarolo & Bisset, 2015; Tarasuk & Eakin, 2003). With charitable models as the main response to hunger and food security, these issues become “depoliticized” and hidden (Roncarolo & Bisset, 2015, p.199). Food bank models that promote food choice, quality, and offer opportunities for users to participate in the operation may be experienced more positively by users (Perry, Williams, Sefton & Haddad, 2014).

In response to the limitations of charitable interventions and increasing food insecurity in Canada, alternative food security interventions are being developed and implemented. Alternative food security interventions aim to supply people with nutritious and healthy food and as well as involving participants in the planning, preparation and choice of food, developing participants’ capacities of taking charge of their own nutrition (e.g. community gardens and collective kitchens) (Roncarolo & Bisset, 2015). These models also include activities to reduce service dependency and social inequalities, and often include advocacy efforts for hunger issues (Roncarolo & Bisset, 2015). Alternative food security interventions may attract people with different needs and vulnerabilities than those typically served by charitable approaches. As this is a growing area, it is important to understand what these programs do, who they serve, and what participants and stakeholders think of these programs.

### **Examples of Alternative Community Food Security Interventions**

A variety of alternative food programs have been developed to improve issues surrounding food insecurity, poverty, and lack of access to healthy and affordable food. These include programs like collective kitchens, community gardens, healthy corner stores, farmer’s markets, and mobile food markets. These interventions generally aim to improve food security and hunger

by addressing knowledge and skills surrounding food purchasing and preparation (Tarasuk, 2001), by increasing access to nutritious food for low-income people or neighbourhoods (Gittelsohn, Rowan, Gadhoke, 2012), or by increasing community capacity to control the production and distribution of food (Tarasuk, 2001). There are limited studies on the impacts of community programs aimed at improving food access, but those that have been done report mixed results (Gittelsohn et al., 2012; Glanz & Yaroch, 2004; Tarasuk, 2001). Below, several common community level interventions are described.

**Collective kitchens.** Collective kitchens, falling under the umbrella of community kitchens, are programs where participants come together and prepare large amounts of food to bring home (Engler-Stringer & Berenbaum, 2007). They aim to increase access to food, improve food-related knowledge and skills, and foster social cohesion. A systematic review by Iacovou, Pattieson, Truby, and Palermo (2013) found that community kitchens may help participants in several areas related to dietary quality and social wellbeing. For example, participants in these programs reported having greater intake of fruits and vegetables during participation (Fano, Tyminski, & Flynn, 2004) and they also perceived better access to a larger variety of foods than they would have if they were not participating in a collective kitchen (Engler-Stringer & Berenbaum, 2007). People often join a community kitchen for the social interaction it provides, and many participants report improved social support (Tarasuk, 2001) as well as increased community engagement (Lee, McCartan, Palermo, & Bryce, 2010). A review study of collective kitchens suggests that they may also help participants improve food related skills such as food shopping, cooking, and budgeting (Engler-Stringer & Berenbaum, 2005; Lee et al., 2010), although some participants report having adequate prior knowledge of food preparation and resource management (Tarasuk, 2001).

Community kitchens have been criticized as inadequate to address income-related issues that lead to food insecurity (Tarasuk, 2001). Additionally, low participation rates in community kitchens suggest that these programs may be inaccessible to the target population (Kirkpatrick & Tarasuk, 2010), highlighting the importance of improved understanding of the needs of the target population (Loopstra & Tarasuk, 2013).

**Farmers' markets.** Farmers' markets are places where farmers and other producers come to a regular location and sell their products. They have been established to encourage local production and distribution of food and to strengthen relationships between the farmer and the consumer. Consumers perceive many benefits to shopping at farmers' markets including freshness and healthfulness of produce, supporting local food production, and perceived lower cost of produce (Feagan, Morris, & Krug, 2004). Despite these perceptions, farmers' markets have been criticized as being inaccessible to low-income people because of the cost of food available for purchase. Offering subsidies or financial incentives may help address this (Young, Karpyn, Uy, Wich, & Glyn, 2011).

In the United States, several programs aim to increase access to farmers' markets for low-income people who receive food assistance (e.g. Food Stamps, Supplemental Nutrition Assistance Program (SNAP)) by enabling vendors to accept subsidies offered by these programs and/or by providing the participants with vouchers to be redeemed at farmer's markets. Research suggests that vendors are open to working with assistance programs but may lack the resources or facilities to make this feasible (Cole, McNeese, Kinney, Fisher, & Krieger, 2013; Payne et al., 2013). In cases where this has been done, it has been found that self-reported intake of fruit and vegetable intake is higher among participants, and purchases at farmers' markets made using

financial assistance increase (Baronberg, Dunn, Nonas, Dannefer, & Sacks, 2013; Young et al., 2011; Herman, Harrison, Abdelmonem, & Jenks, 2008).

In addition to partnering with food assistance programs to support low-income people, farmers' markets have also been introduced in economically disadvantaged communities, to serve the needs of residents (Young et al. 2011). The introduction of farmers' markets in low-income urban neighbourhoods with poor geographic access to food may impact other aspects of the local food environment; for example, three years after the opening of a farmers' market in a low-income urban area in London, Ontario, the average cost of food at other food retailers in that area had decreased and a greater variety of produce was available at other food retailers in that area (Larsen & Gilliland, 2009).

**Urban agriculture.** This includes activities such as growing fruits and vegetables or raising animals for consumption in an urban area. Community gardens are a type of urban agriculture where people come together in a shared space to grow and harvest fresh produce. They are implemented with the goal of increasing the fruit and vegetable intake of community members. Some studies have found that people who use community gardens report a higher, more varied intake of fruits and vegetables (Alaimo, Packnett, Miles, & Kruger, 2008; Lackey, 1998; Litt, Soobader, Turbin, Hale, Buchenau, & Marshall, 2011). Community gardens can also have positive social benefits for participants. Participants report building their social networks and feeling engaged in their communities through participation in community gardening projects (Blair et al., 1991; McCormack, Laska, Larson, & Story, 2010). Community gardens may increase participants' access to culturally meaningful food and food preparation practices (Carney et al., 2012); however, the extant studies have methodological limitations; most are cross-sectional, have no baseline comparison groups, and have used un-validated tools to

measure dietary patterns (McCormack et al., 2010). Concerns about soil safety in urban areas (Hou & Grohman, 2018) and land access in urban areas are challenges faced by community gardening projects (Guitart, Pickering, & Byrne, 2012).

**Healthy corner stores.** These initiatives aim to increase the availability of fresh produce at neighbourhood corner stores to improve access to fruits and vegetables for people who have low income. Research suggests that such efforts result in a greater variety of fruits and vegetables available in participating stores (Cavanaugh et al., 2014). Promotional activities, such as nutrition education, taste tests, and advertising, are often employed alongside access to produce which is associated with increased sales of these foods (Dannefer, Williams, Baronberg, & Silver, 2012; Martin et al., 2012). Earlier research suggested that healthy corner stores have several benefits, including increased food availability, improved food purchasing behaviours, and increased consumer knowledge (Gittelsohn et al., 2012). However, later research on such stores is mixed; one controlled before and after (CBA) study (Song, Gittelsohn, Kim, Suratkar, Sharma, & Anliker, 2009) found increased purchasing of some promoted healthier foods, but not others, while a randomized controlled trial (RCT) found no increases in sales of promoted foods (Budd, Jeffries, Jones-Smith, Kharmats, McDermott, & Gittleson, 2017). A cluster randomized controlled trial conducted with people living on one a Navajo nation (Jernigan et al., 2018) found no increase in fruit and vegetable consumption compared to controls, but another found decreased BMI among customers of healthier small stores in a study of a different Navajo nation compared to controls (Gittelsohn, 2013). After participating in healthy corner store initiatives, consumers report increased understanding of diet, health, and food preparation. (Gittelsohn et al., 2010).

There may be a disconnect in perspectives between consumers and store owners; findings suggest that neighbourhood residents are interested in purchasing fruits and vegetables from these food retailers but store owners express concern about cost, lack of store space, and lack of customer demand (Dannefer et al., 2012; O'Malley, Gustat, Rice, & Johnson, 2013).

Additionally, wholesalers who supply fruits and vegetables may be apprehensive about working with corner stores because it may not be profitable (O'Malley et al., 2013). Investigating these differences in perspective is an important area for future research on alternative food security interventions.

**Mobile food markets.** Mobile food markets are travelling markets that aim to increase access to fresh produce, grains and legumes in low-income neighbourhoods. Mobile food markets may be useful for addressing geographic barriers to accessing food because they can travel to areas that are underserved by grocery stores, supermarkets, or convenience stores. A recent systematic review found that location was the most frequently reported reason for using a mobile produce market (Hsiao, 2019). Variations of the model have been implemented across North America but there has been little evaluation of these programs. A study assessing perceptions of a mobile produce market found that it included elements that may promote access to fruits and vegetables and that many participants were satisfied with program design elements that might promote access to fruits and vegetables, such as availability, quality, and affordability of produce (Hsiao et al., 2018). Some research on mobile food markets suggests that they can influence fruit and vegetable intake. A study found that mobile food market shoppers consumed 1.5 times the amount of fruit and vegetables per day than non-shoppers (Zepeda, Reznickova, & Lohr, 2014). Two intervention studies found increased vegetable consumption among mobile food market users. Fruit intake increased in one of these studies but not in the other (AbuSabha

& Namjoshi, 2011; Evans et al., 2011). In another study frequency of use was associated with increased consumption of fruits and vegetables (Leone, Haynes-Maslow, & Ammerman, 2017). A cluster randomized trial of a mobile food market in low-income urban neighbourhoods in North Carolina, found no difference in perceived food access between participants in the intervention and control neighbourhoods but participants in the intervention group reported increasing their fruit and vegetable consumption by about 0.5 cups per day more than the control group (Leone et al., 2018). However, much of this difference was due to decreases in consumption among the control group. In addition to their influence on fruit and vegetable intake, mobile produce markets have been associated with other benefits, such as socialization (AbuSabha, Namjoshi, & Klein, 2011). Future research should evaluate the influence of mobile food markets and how their implementation could influence whether and how these programs achieve outcomes (Tester, Stevens, Yen, & Laraia, 2010).

Interventions to improve food access are well-intentioned but have been subject to criticism. A major criticism is that these programs do not change people's food insecurity status and that they shift attention away from the primary cause of hunger and food insecurity: poverty (Tarasuk, 2001). As food insecurity persists and rises in some areas of Canada (Tarasuk et al., 2014), it is important to assess what these programs accomplish as well as how they are perceived by program developers and participants. Although they may not alleviate food insecurity, they may have important benefits for individuals and their community and contribute to advocacy efforts which could lead to policy change that targets the main causes of food insecurity (inadequate financial resources). Studying these programs will also contribute to our understanding of how to best allocate resources and develop programs with realistic aims, and tailor them according to need. Furthermore, exploring factors that may facilitate uptake of new

food retailing in communities is important, particularly given limited uptake in communities that have voiced support for new retailers (Cummins, 2014).

### **The Dissertation Study**

This research concerns a novel community food security intervention called the MarketMobile, a mobile produce market implemented in four communities in the National Capital Region in July 2014. The research studies in this dissertation describe the implementation of the program and its perceived impacts during its pilot phase, which occurred from July 2014 to December 2014. The program was developed by the Poverty and Hunger Working Group of Ottawa (PHWG) as a response to food insecurity in Ottawa communities.

The PHWG is an initiative of the Coalition of Community Health and Resource Centres. Since its creation in 2011, its efforts have involved addressing food security and its impact on people living in poverty. The PHWG has facilitated access to healthy and affordable food in Ottawa communities since its inception. This group is strongly connected to Ottawa neighbourhoods and communities through its diverse partnerships. Its members include representatives from the Ottawa Coalition of Community Health and Resource Centres, Just Food, Ottawa Community Housing, The Good Food Box, the Social Planning Council, Ottawa Poverty Reduction Network, Group d'Action Francophone Communautaire, Ottawa Public Health, and the City of Ottawa.

Using the Good Food Market program (pop-up markets selling fruits and vegetables) as a pilot program, the PHWG developed the Ottawa MarketMobile. Overall, the objectives of the program as outlined by the PHWG were: 1) to enhance health and increase food security; 2) to improve equitable access to nutritious foods; 3) to increase community engagement, participation, and resilience; 4) to increase capacity of community members; and, 5) to improve

collaboration among non-traditional partners (MarketMobile Report, 2015). The program's target population included people of low income, seniors, recent immigrants, people with disabilities, and single parents with young children. The program was implemented in four communities in the National Capital Region; three low-income urban neighbourhoods and one rural community.

The MarketMobile received funding from Ottawa Public Health, the Anti Poverty Project, and Ottawa Community Housing. The total cost of running the program during the pilot was \$42,000 which covered the cost of rent of the OC Transpo bus, the cost of program coordination, and promotion and supplies (MarketMobile Report, 2015). Planning for the MarketMobile began in 2013, included on the agenda as part of regular PHWG meetings. Eventually, a separate steering committee was created to manage the implementation of the program. Many people were involved in setting up the program. The number of people at PHWG meetings fluctuated depending on availability but meetings were attended by ten to fifteen people. The steering committee was comprised of eight people and included representation from the PHWG, Ottawa Public Health, Loblaws (a major grocery store chain), several community health and resource centres, and community members. At the time of this study, the MarketMobile was a bus rented from OC Transpo, the public transit agency in Ottawa, Ontario, which was equipped with shelving to accommodate fresh produce that brings fresh fruit and vegetables to identified communities. The program partnered with Loblaws, which provided food for the program at wholesale cost plus five percent. Because of this, the program was able to sell produce at a discounted price, which was lower than the same produce sold at Loblaws grocery stores. Registered dietitians from Loblaws provided their services to help coordinate

food orders and to organize nutrition information and food demonstrations on program delivery dates.

The PHWG invited application from Ottawa communities interested in receiving the program and they selected four sites to participate. Three urban communities, Carlington, Hunt Club, and Morrison Gardens, were selected based on economic and geographic need. Selection criteria included being in the fourth or fifth lowest socio-economic income quintile and having a population weighted centroid approximately 1.5 kilometres from the nearest grocery store. Income quintiles provide an estimate of neighbourhood advantage and include socio-economic indicators such as education level, occupational characteristics, income, living conditions, and immigration (Parenteau, 2008). A rural community called Vars was selected based on geographic need (i.e. having a population weighted centroid approximately fifteen kilometres away from the nearest grocery store).

Information about the communities comes from the Ottawa Neighbourhood Study, a population health study based out of the University of Ottawa which seeks to better define Ottawa neighbourhoods and to measure social determinants of health within these neighbourhoods. Morrison Gardens is an urban community in the west end of the City of Ottawa with a population of 4280 people. Its low-income prevalence was 15.2%. Its unemployment rate was 8.8%. Between 2011 and 2016, 2.9% of its population were newcomers to Canada and 19.6% of its population were visible minorities. Caldwell is another west end Ottawa neighbourhood with a population of 9820. Its low-income prevalence was 30.9%, making it the most economically disadvantaged community that received the MarketMobile. Between 2011 and 2016, 3.4% of its population were newcomers to Canada. Approximately 33% of its population are visible minorities. Its unemployment rate was 10.8%. Hunt Club East is located

in the east end of the city. Its low-income prevalence was 8.4% and its unemployment rate was 6.6%. Between 2011-2016, 6.6% of its population were newcomers to Canada and 42.4% of its population were visible minorities. Vars is an eastern rural community with a population of approximately 2540 people. This community has a low-income prevalence of 5.1%. Its unemployment rate was 2.6%. Between 2011 and 2016, 0.3% of its population were newcomers to Canada and 1.4% of its population were visible minorities.

During this study, the MarketMobile visited two of the four sites each Saturday from July 2014 to December 2014, alternating sites each week. It followed this pattern for the entirety of the pilot phase. Often, steering committee members volunteered their time on market delivery dates (e.g. loading the bus with produce at Loblaws, setting up on site, and unloading at the end of the day). Customers entered at the front of the bus and were assisted by volunteers who helped them select their food and provided their receipts. The customer exited at the back of the bus and paid at a check out table located outside of the bus. Informational pamphlets and resources (e.g. recipes, smoking cessation information, dietary guidelines, information about community resources, etc.) were also available.

The MarketMobile program was implemented to help people improve their diets and communities by intervening at different levels. This intervention does not claim to eliminate food insecurity and it is not intended only for individuals who are food insecure; rather, it was developed and implemented to increase access to fresh fruits and vegetables to underserved communities and build community capacity (MarketMobile Final Report, 2015). The purpose of this research is therefore not to determine whether this intervention has improved food security status or to identify communities or individuals as food insecure. Rather, the purpose of the present project was to investigate the implementation of MarketMobile, its perceived outcomes,

and the perceptions of its contribution to urban and rural communities from both a stakeholder and consumer point of view.

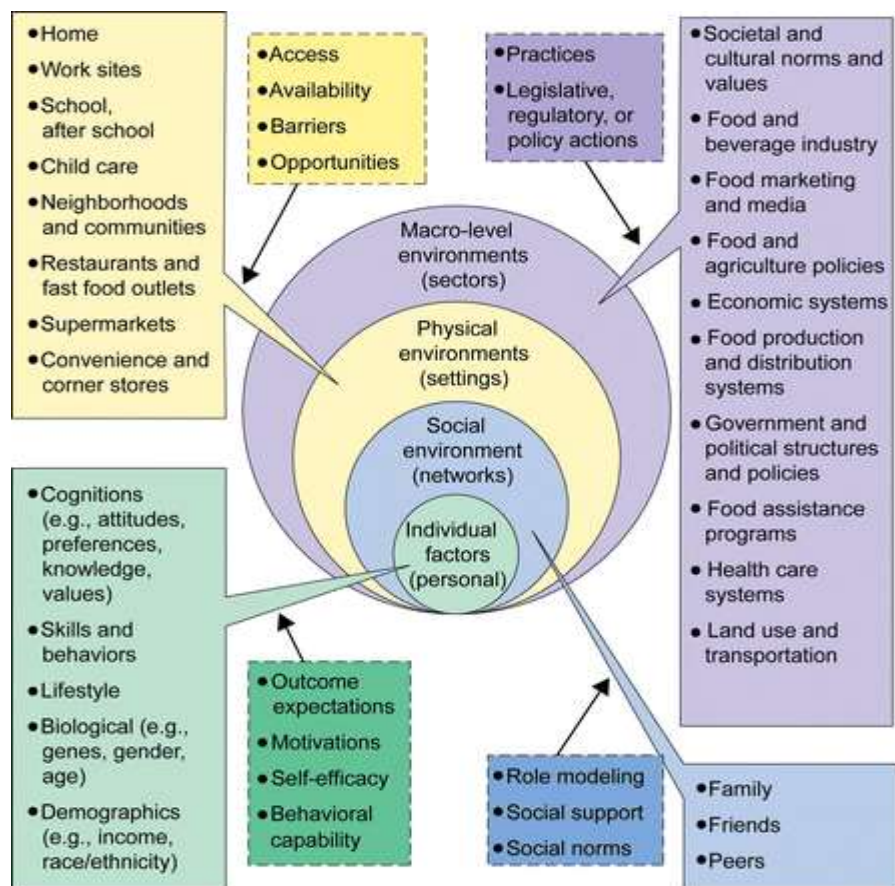
### **Conceptual Model: A Social Ecological Model of Community Food Programs**

Diet is an important and modifiable determinant of health. Much research has focused on individual level determinants of health-related behaviours, such as food choice (Larson & Story, 2009). Increasingly, it is being recognized that health behaviours may be constrained by environments that are not supportive of health promoting behaviours and that individual change is more likely to occur and be sustained in environments that promote healthy food choices (Larson & Story, 2009). Thus, interventions to improve diet by addressing barriers at multiple levels within an environment may contribute to improved health outcomes. Because of this, an ecological perspective was chosen to guide this research.

An ecological perspective on factors influencing health, nutrition, and food security is useful for several reasons. This perspective recognizes that there are many dynamic connections that influence food selection, and thus diet quality, that occur at multiple levels. An ecological model of food selection and eating behaviour was used to guide this research (Story et al., 2008). The model includes factors at multiple levels in the environment that interact to influence food selection and eating behaviours. Please see Figure 1 for a visual representation of the model's levels. Individual level factors include personal beliefs, behaviours, and biological and demographic factors. Social environments include interactions with others that influence what we eat through mechanisms such as role modelling, social support, and social norms. Physical environments include the places where people eat or get food. Macro-level environments, while more distal, have an important influence on what people eat and include, but are not limited to,

cultural norms and values, governmental policies, economic systems, and food and agricultural systems.

An ecological model is useful for studying the implementation and perceived impacts of the MarketMobile for several reasons. First, although not explicitly designed from the model by Story et al. (2008), the MarketMobile is an intervention that targets individual health through modifying the environment at different levels. It includes both an environmental change component (e.g. bringing food into communities) and strategies to target individual behaviour (e.g. financial incentives, educational components, other resources). It also includes strategies to improve community capacity through encouraging social interaction, volunteering, skills development, improve collaboration among community partners, and promote continued engagement in community programming. Interventions that target multiple levels of influence are more likely to be effective (Story et al., 2008). Second, the program's objectives recognize the complex and dynamic factors that influence what people eat. Third, the MarketMobile is a community food program where those involved come from different organizations and settings, and are acting from different levels, such as the individual, the community, and city government. The social ecological model assumes that programs can be more effective when there are coordinated efforts by individuals and groups acting at different levels (Stokols, 1992). An ecological model is useful for studying community food security interventions because of the interplay between individual and environmental factors that increase vulnerability to food insecurity (Roncarolo et al., 2015).



Story M. et al. 2008.  
 Annu. Rev. Public Health. 29:253–72

Figure 1. Ecological model of what people eat (Story et al., 2008). Used with copyright permission.

## Rationale

By investigating a novel food security initiative, the MarketMobile, this research addressed gaps that exist in the literature on community food security programs. First, community food security programs, while being widely developed and implemented in Canada and the United States as a response to hunger, are largely under studied. To better understand whether and how these programs might contribute to food access and issues related to food insecurity, it is important to study their implementation, outcomes, and how they are perceived by stakeholders and community members. Additionally, these programs are resource intensive,

requiring significant time, money, and personnel to implement; they also rely heavily on public funding. Knowing what is being accomplished by these programs is important so that we can allocate resources effectively, particularly when community organizations are working with limited resources.

Second, previous research suggests that the needs of households targeted by community food programs may differ in urban and rural contexts and that stakeholder and consumer points of view about food related needs and programming often diverge (Hamelin, Mercier, & Bédard, 2008; Tarasuk et al., 2014). It has also been found that participation rates in community food programming in low-income urban areas is low, suggesting disconnection between available programming and the needs and wants of community members (Kirkpatrick & Tarasuk, 2009). It is important to investigate how programs are structured and how they are perceived so that they can be tailored to benefit their intended audience. This research examined food related needs of target users and program developers' perceptions of needs in both urban and rural contexts.

Third, mobile markets are a relatively recent model of community food programming, and studies on them are scarce (Leone, 2018; Zepeda, Reznickova, & Lohr, 2014). While these programs bring fresh produce to areas with poor geographic access to food, it remains unclear whether they effectively help their intended audience or whether they achieve intended social goals. In addition to improving access to fruits and vegetables, the MarketMobile's objectives included increased community engagement through encouraging social interaction, food skills education, and volunteerism, as well as improved collaboration through strengthening relationships between public, private, and community partners to address food insecurity (MarketMobile Report, 2015). Most studies on community food programs, including but not limited to mobile markets, have focused on health-related outcomes or economic outcomes,

rather than investigating social outcomes. Furthermore, there has been little investigation into how these programs are implemented and gaps remain regarding how aspects of the built or social environment could influence the ability to access healthy and affordable food (Loopstra & Tarasuk, 2013; Popkin, Duffey, & Gordon-Larson, 2005). It is important to investigate the implementation of these interventions so that we can better understand whether they are meeting their objectives and how they might be achieving or falling short of outcomes. Considering how social, physical, and macro levels of the environment influence people's food behaviours and dietary outcomes could help enhance food programs, such as the MarketMobile, because they could include factors from each level to best achieve outcomes. Additionally, understanding factors in the implementation of such interventions can assist program developers in addressing whether resources are being allocated effectively.

In addition to the lack of research on program implementation, there is a lack of theory behind these types of programs. An important goal of this research was the collaborative development of a theory of change with the Poverty and Hunger Working Group. Theory of change informs program design, implementation, and evaluation and describes how and why a program is expected to work by outlining contextual factors, program inputs and outputs, program activities, short and long-term outcomes, assumptions, and rival explanatory factors for outcomes (Connell & Kubisch, 1998). Developing a theory of change with key stakeholders in a workshop format has several benefits: knowledge is shared, perspectives are challenged, and assumptions are made explicit (Breuer, Lee, De Silva, & Lund, 2015).

Community projects are often introduced without explicitly describing a theory of change. Theory of change creates a picture of how change occurs and what is required to achieve a goal. It can be used as a guide to help stakeholders assess what the program can influence, what

impact it can have, and whether it is realistic to expect that they will reach their goals with the resources they have. This is especially important in community programs related to food security, as they are new, and their mechanisms of change and impacts are less understood. Community initiatives can be difficult to investigate because their objectives and the ways that these programs are structured are often not completely outlined at the start. Indeed, they may change over the course of the delivery of the program, as was the case with the MarketMobile. For this reason, it was important to outline a theory of change to clarify the intervention itself. This is an important area for investigation as the organizations operating these programs may use them as part of a long-term strategy for anti-poverty work and social justice, and have program goals that include building community capacity, and other social goals. The research in this thesis addressed this gap by interviewing program developers about the perceived effectiveness of their strategies to promote access to healthy and affordable food, engage the community, and ensure sustainability.

### **Objectives**

The primary purpose of this research was to investigate the implementation and perceived impacts and outcomes of the MarketMobile, an alternative community food program. This research comprises two studies. The first study used a participatory research approach to develop a theory of change which guided an implementation evaluation of the MarketMobile, based on a framework recommended by Saunders, Evans, and Joshi (2005). The second study investigated perceived program outcomes, according to program participants and developers. This investigation was done through the lens of Story et al.'s (2008) model and the environmental levels were used better understand the perceived contribution of the MarketMobile.

## Research Objectives and Questions

The first objective concerns the program's theory of change. The research questions for the first objective were:

- What are indicators of program success?
- What are key processes and contextual factors for communities to consider in development for such an intervention?
- What are barriers/obstacles to program activities?

The second objective addresses program process and implementation. Research questions are listed according to the components outlined by Saunders et al., 2005:

- Fidelity. To what extent was the MarketMobile implemented as planned in each community?
- Dose Delivered. To what extent were the intended components of the intervention provided to program participants?
- Dose Received. How did participants react to specific aspects of the intervention? Do participants intend to continue using the MarketMobile? Why or why not?
- Reach. What were the characteristics of program users? Were they representative of those most at risk for food insecurity? Did this differ across target community?
- Recruitment. What planned and actual recruitment procedures (advertising activities) were used to attract individuals, groups, and/or organizations? What planned and actual procedures were used to encourage continued involvement of individuals, groups, and organizations? What were the barriers to maintaining involvement of individuals, groups, and organizations?
- Context. What factors in the organization/steering committee, community, social/political context could potentially affect either intervention implementation or the intervention

outcome? How did program developers perceive the collaboration among stakeholders?

To what extent can the program be sustained?

The third objective addressed the perceived outcomes of the Market Mobile. The research questions for this objective were:

- What were the perceived outcomes of the MarketMobile at the ecological levels included in Story et al.'s (2008) model? For example, at the individual level, did the program contribute to: a more varied, healthier diet? Increased consumption of fruits and vegetables? Lower stress around food acquisition? Did the program lead to perceived changes in participants' social environments? Did the program lead to changes in the physical environment?
- What was the contribution of the MarketMobile to both individuals and communities, according to participants and stakeholders?
- How was the MarketMobile perceived across urban and rural settings by both participants and stakeholders?
- Were there adverse or unintended consequences of the program?

### **Definition of Terms**

In the following papers, the term stakeholder will be used to refer to program steering committee members and community developers who were responsible for developing and implementing the program. The term participant will be used to refer to MarketMobile program users. We recognize that program users also have a stake in the MarketMobile program and are positioned to be influenced by (and influence) the program.

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**Implementation Findings of a Mobile Produce Market in Disadvantaged Communities in  
the National Capital Region**

Platts, J., B.A.<sup>1</sup>

Kristjansson, E., Ph.D.<sup>1,2</sup>

Enns, Aganeta., M.Sc.<sup>1</sup>

School of Psychology, University of Ottawa<sup>1</sup>

Institute of Population Health, University of Ottawa<sup>2</sup>

### **Abstract**

Food insecurity is a major problem in Canada. Community programs have been a primary response to food insecurity, but there is a dearth of research on their implementation. A novel food insecurity program, the MarketMobile, was developed and implemented in Ottawa, Ontario in July 2014 to address barriers to food access in urban and rural communities. The program brought fresh fruits and vegetables at a discounted price to disadvantaged urban and rural Ottawa communities. This study investigated the implementation of the MarketMobile from the perspectives of both program users and program stakeholders using a participatory research approach. Surveys, semi-structured interviews, document review, and a fidelity questionnaire were used to assess program implementation. Findings suggest that the program was implemented as planned in many ways but that there were implementation weaknesses. Participants reported satisfaction with program design elements such as the novelty of the program, location, affordability and quality of produce for sale, and staff and volunteers. Areas for improvement included program timing, variety and availability of different types of produce for sale, and advertising. Ways of addressing implementation challenges are discussed.

Implementation Findings of a Mobile Produce Market in Disadvantaged Communities in the  
National Capital Region

Food insecurity refers to the inability to obtain enough safe, healthy, and culturally appropriate food in socially acceptable ways (Tarasuk, Mitchell, & Dachner, 2014; Ontario Public Health Association, 2002). It is a major public health concern in Canada and has consistently been associated with poor physical and mental health outcomes (Pérez, Roncarolo, & Potvin, 2017; Che & Chen, 2001; Tarasuk, Cheng, Oliveira, Dachner, Gunderson, & Kurdyak, 2015; Darling, Fahrenkamp, Wilson, D'Auria, & Sato, 2017). Canadian adults who are food insecure are less likely to have adequate nutritional intakes than their food secure counterparts, reporting lower intakes of fruits and vegetables (Kirkpatrick & Tarasuk, 2008). Food insecurity has been associated with increased risk of chronic health conditions (Seligman, Laraia, & Kushel, 2010) and may also be an outcome of such conditions (e.g. diabetes) (Tarasuk, Mitchell, McLaren, & McIntyre, 2013). Above and beyond income, food insecurity has been associated with increased risk of overweight and obesity in women (Townsend, Peerson, Love, Achterberg, & Murphy, 2001; Becker, Middlemass, Taylor, Johnson, & Gomez, 2017). People who are food insecure have increased odds of self-reported mental health concerns such as anxiety and depression, and report experiencing loss of dignity, lack of control, distress, and alienation (Muldoon, Duff, Fielden, & Anema, 2013; Hamelin, Beaudry, & Habicht, 2002).

Certain socio-demographic characteristics are related to food insecurity. For instance, people who rely on social assistance, rent their homes, are single mothers, and are recent immigrants are more likely to be food insecure (Olabiyi & McIntyre, 2014; Tarasuk & Vogt, 2009). Inadequate financial resources are the strongest predictor of food insecurity, but not all people living in poverty are food insecure. Environmental factors may also influence food

insecurity status. A Quebec study found that social-environmental factors, such as social deprivation, low social cohesion, and high neighbourhood disorder significantly increased the odds of being food insecure for children (Carter, Dubois, Tremblay, & Taljaard, 2012). Aspects of the environment, such as number of food retailers and distance to food retailers may constrain people's ability to access food and influence food security status; however, findings on this relationship are mixed. For example, some research suggests that the addition of food retailing in areas with previously poor access to food stores did not improve food security status (Cummins, Petticrew, Higgins, Findlay, & Sparks, 2005; Dubowitz, 2015), diet, or body mass index (Cummins, Flint, & Matthews, 2014). Additionally, food insecurity was not alleviated by the presence of lower-priced food retailers in Toronto neighbourhoods characterized by high levels of poverty (Kirkpatrick & Tarasuk, 2010) but the implementation of a new supermarket in a Philadelphia neighbourhood was found to improve residents' perceptions of food access in their community, although it did not improve fruit and vegetable consumption (Cummins et al., 2014).

In Canada, community level interventions that address barriers to food access at both the individual and environmental level have been a major response to food insecurity (Tarasuk & Eakin, 2003). Examples include urban agriculture projects, collective kitchens, community gardens, and, more recently, mobile food markets. In addition to their focus on food insecurity, these programs often have health promotion and community development goals. Typically, they are multilevel interventions, offering financial incentives, educational and skills components, changing the community food environment, and engaging in anti-poverty advocacy (Hamelin, Mercier, & Bédard, 2008; Loopstra & Tarasuk, 2013; Roncarolo, Adam, Bisset, & Potvin, 2015).

There is a growing literature investigating these programs, but much of the research on these interventions addresses outcomes and investigations regarding the process of program

implementation have been neglected. Additionally, most research has focused on programs offered in urban areas; gaps remain regarding interventions and their implementation in rural settings. Geographic factors affecting those in rural areas, such as fewer food retailers and increased cost of diet as a result of travel, may increase risk for food security and may have implications for the kind of programming that would be beneficial to people living in such areas (Buck-McFayden, 2015; Dean & Sharkey, 2011). Additionally, rural and urban areas have unique strengths, vulnerabilities, and needs which may influence how interventions should be implemented to be effective depending on rural or urban context (Carter, Dubois, & Tremblay, 2013).

The present study reports on a process evaluation of a mobile food market project called the Market Mobile. Process evaluation monitors program implementation and helps us to understand program activities, ways in which a program is implemented, and how these might relate to program outcomes and impacts (Linnan & Steckler, 2002). This is useful for several reasons. First, it can help improve program quality. Second, it clarifies how well program activities are implemented and the context in which implementation occurs (Rosecrans, Gittelsohn, Harris, Naqshbandi, & Sharma, 2007). Third, in programs implemented across different locations, examining variability in delivery among sites can highlight and explain relative success and failures. Such lessons learned can guide considerations for program implementation in other settings (Durlak & DuPre, 2008).

It is important to investigate the implementation of community food security interventions so that we can better understand how and why programs might be achieving or falling short of successful outcomes (Bellows & Hamm, 2002; Durlak & DuPre, 2008). These programs are generally highly resource intensive and rely significantly on public funding to carry

out activities. Understanding implementation factors could help clarify whether resources are being allocated effectively and appropriately; these evaluations can identify program strengths and weaknesses, guide program improvements, and inform future programming by highlighting the likelihood of a program achieving success (Rosecrans et al., 2007).

### **Description of the Program**

The MarketMobile is one such program developed to address access to food and food insecurity in Ottawa, Ontario. It was developed by the Poverty and Hunger Working Group (PHWG), an initiative of the Ottawa-based Coalition of Community Health and Resource Centres. The PHWG includes members from Ottawa community health and resource centres, community residents, and representatives from organizations such as Ottawa Public Health. The program was piloted between July 2014 and December 2014; it brought fresh produce to four Ottawa communities with limited access to food, either because of distance, limited financial means, rural context, or few food retailers within the community. A unique aspect of the MarketMobile is that it was fostered through a public-private partnership with Loblaws Inc., who supplied the produce at cost plus five percent.

At the time of the pilot, the MarketMobile was a rented OC Transpo bus retrofitted with shelving units. The program brought fresh produce to four participating communities on a rotating biweekly schedule. Initially, the MarketMobile would arrive at Loblaws on Saturday mornings staffed by the program coordinator and program volunteers. The MarketMobile staff and volunteers worked with employees at Loblaws to load the produce order onto the bus. From there, the bus would drive to the first community and set up. It would be open for ninety minutes and customers would walk through the bus, select their produce with the assistance of volunteers, and pay for their food outside of the bus at a table run by volunteer cashiers. Other services,

resources, and activities were provided on site concurrently with the bus, such as recipe taste testing, smoking cessation information, public health nurses, and registered dietitians, as well as activities for children. Then, the program would pack up and drive to the next community where the same process would be repeated. At the end of the day, the bus would drop off leftover food at the Rideau Rockcliffe Community Health and Resource Centre where the food would be donated or sold to the Centre's food bank. Customers for the program were recruited in different ways. For example, advertising through major Ottawa media outlets, volunteers going door to door, and through other community events. Any remaining produce was returned to the Rideau-Rockcliffe Community Health and Resource Centre and sold to either the Ottawa Food Bank or to the Carlington Community Health Centre food bank. In early August, the MarketMobile sought out an additional food supplier and purchased foods that were unavailable through Loblaws or sold at a lower price.

### **Participatory Approach**

A unique methodological aspect of this study was the use of a participatory research approach, which has been largely neglected in the current literature on food security interventions. Indeed, the food insecurity research may be enhanced by including the voices of people who develop and use food security interventions; to better understand how communities might “mobilize themselves for change” (Pine & de Souza, 2013). There are many different types of participatory approaches and no one definition of a participatory research approach is agreed upon in the literature (Cullen & Coryn, 2011). A framework by Cousins & Whitmore (1998) can be used to understand participatory research approaches. This framework includes three dimensions: 1) control of the evaluation process, 2) stakeholder selection for participation (e.g. who is involved), and 3) depth of participation. Because participatory research is so

broadly defined, it is important to outline how it can be conceptualized and used (Cullen & Coryn, 2011). The purpose of using a participatory research approach in this project was to improve practical use of the evaluation while also improving our understanding of this program, its implementation, and potential perceived outcomes (Coryn & Cullen, 2011). Please note that perceived outcomes are reported in the second research study of this dissertation. In terms of control in the evaluation process, the researcher and the stakeholders worked in partnership at most stages of the research process; however, the researcher acted as a facilitator and guided the evaluation. Involved stakeholders mainly comprised program implementers, but there were some community members (e.g. intended program users) involved too. The depth of participation was extensive, with stakeholders participating at most stages, including identifying evaluation questions, outlining the theory of change, identifying methods, and collecting data.

Consistent with best practices in participatory research, it was important to clarify the value added to this research project in adopting a participatory approach to determine whether the approach was appropriate and feasible (Gujit, 2014). This was guided by two main questions. The first addresses the purpose of stakeholder participation. The second addresses whose participation matters and why. These questions, and their relevance to this research, are addressed in the following sub-headings.

**What purpose will stakeholder participation serve in this evaluation?** The literature on participatory research approaches identifies practical and ethical rationales for using a participatory approach (Gujit, 2014). Both were relevant to the present research project. Pragmatically, some research suggests that a participatory approach leads to a better understanding of the data, more appropriate recommendations, and better uptake of the findings as research and program development is driven by local people's needs and involves diverse

viewpoints and experiences. Because of this, a participatory approach can be particularly helpful for creating and refining a program's theory of change (Gujit, 2014). Ethically, a participatory approach allows people to be involved in informing decisions that indirectly or directly affect them. A key rationale for adopting a participatory approach in this research was its relevance to the mission of the group responsible for developing and implementing the MarketMobile: the Ottawa Anti-Poverty Project and their initiative, the Poverty and Hunger Working Group. The Anti-Poverty Project has a philosophical commitment to participation; their mission is to include low-income people and promote their voice on issues that affect them, improve community capacity to resolve issues, and increase advocacy by low-income people to improve policies and programs that affect them. This commitment aligns with using a participatory research approach.

**Whose participation matters and why?** Stakeholder involvement is not always possible or desirable at every stage of the research project and so it was necessary to consider who to involve and why (Gujit, 2014). Participation included intended program users and decision makers, as research suggests that it can be beneficial to include people who are able to use the data (Cousins, 1995). Stakeholders who were familiar with the program and the participating communities were invited to participate. In terms of feasibility, stakeholders who were consistently able to attend program meetings and had time to devote to research activities were involved as research partners. In this research, stakeholders were involved in defining and developing the intervention and outlining the theory of change. They were also involved in creating and refining the evaluation questions and in identifying program components to be evaluated. They reviewed and gave feedback on data collection materials (e.g. they suggested survey and interview questions). Stakeholders were also involved in reviewing data, sharing it at meetings, and using it to make decisions about the MarketMobile. Time availability and financial

constraints limited the involvement of stakeholders in data collection and analysis stages of the project, although one stakeholder consistently completed a program fidelity measure. Thus, the analysis and interpretation stage of the research is not considered to be participatory.

### **Study Objectives**

The objectives of this study were to develop the MarketMobile theory of change with stakeholders and to describe the implementation of the MarketMobile during its pilot period in each of the target communities from stakeholder and customer perspectives. We were also interested in understanding whether and how the implementation process differed in urban and rural contexts. The research questions are mapped onto the process evaluation components in Table 1 on the following page. Information about perceived outcomes of the program are reported in the second study in this dissertation.

### **Developing the Project's Theory of Change**

Theory of change arose from the challenge of evaluating programs when it was unclear what the program set out to do and how the program intended to accomplish outcomes, making it a useful approach guiding evaluation of programs that are new. Theories of change outline assumptions about the process through which an intervention has its impacts and helps explain how and why a program achieves outcomes (Weiss, 1995). A theory of change lays out the sequence of activities and expected outcomes, helping us to understand what a program has achieved and how. This provides a framework for conducting research and evaluation on programs, as it helps stakeholders identify anticipated outcomes and mechanism for achieving them (Connell & Kubisch, 1998). A theory of change uses existing evidence, which can come from the previous research or experience (e.g. intimate knowledge of the local context), to inform the rationale of the intervention. Developing a program's theory of change has

advantages such as helping stakeholders come to consensus about what can be achieved, and how, considering resource and constraints. In this research, it was important to develop a theory of change collaboratively with people involved in the program and intended users to guide the research and enhance our understanding of the food issues in these communities. The MarketMobile had social goals of promoting community change, increasing advocacy, and helping communities mobilize for change, like other community food security interventions. Using a participatory approach and involving people responsible for developing the program and people who could benefit from the program in the research process was done to address the goals.

The MarketMobile theory of change was constructed during a series of meetings in May and June 2014 and an hour-long workshop in early July 2014 prior to the implementation of the program in the participating communities. It provided the foundation on which the process evaluation was designed and conducted. A participatory approach was used in this process; the meetings were facilitated by myself, my supervisor, and a research assistant and involved participation from the MarketMobile steering committee, program developers, community leads, and community representatives participated. The participants were asked to share their thoughts about the purpose and goals of the program, contextual issues that could influence implementation, their assumptions about how the program would achieve its goals, expected outcomes, and thoughts about obstacles, unintended consequences of the program, and other factors that could account for outcomes or lack thereof (Anderson, 2004). Participants also provided feedback about the research and evaluation process. A challenge of collaboratively creating the theory of change was the limited time available for evaluation and research purposes at the existing meetings. As the program had received their funding in March 2014 and were

expected to launch in July 2014, a major focus of the meetings was planning for the operation of the program. To account for time constraints, the steering committee also provided ideas, feedback, and questions via email. Once the initial theory of change was constructed, it was sent to the steering committee, program developers, community leads, and community representatives for review. These participants provided feedback to clarify and the theory.

### **Evaluation Framework**

The present study uses the approach outlined by Saunders, Evans, and Joshi (2005) to investigate the process of implementing the MarketMobile. This process addresses multiple components at different levels and considers aspects related to the individual, the intervention, and the community context, making it compatible with Story et al.'s (2008) model, which considers influences from multiple levels on health related behaviours, and interventions guided by a social-ecological perspective. As an intervention that targets both individual and broader contextual factors related to food insecurity, The MarketMobile model fits well with this perspective.

Saunders et al. (2005) aimed to develop a user friendly and systematic approach to process evaluation for public health interventions. For the purposes of process evaluation, this paper reports on the components outlined by Saunders (2005): fidelity, dose delivered, dose received, reach, recruitment, and context. Additionally, as per the request of the Poverty and Hunger Working Group, we included components assessing potential program sustainability. This was included in the context component. Determining how to interpret, measure, and assess these components was a collaborative effort between the research team and program developers.

*Table 1. Research questions mapped onto process evaluation components*

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Research questions mapped onto process evaluation components

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1. *Fidelity.* To what extent was the MarketMobile implemented as planned in each community?
  2. *Dose Delivered.* To what extent were the intended components of the intervention provided to program participants?
  3. *Dose Received.* How did participants react to specific aspects of the intervention? Do participants intend to continue using the MarketMobile? Why or why not?
  4. *Reach.* What were the characteristics of program users? Were they representative of those most at risk for food insecurity? Did this differ across target community?
  5. *Recruitment.* What planned and actual recruitment procedures (advertising activities) were used to attract individuals, groups, and/or organizations? What planned and actual procedures were used to encourage continued involvement of individuals, groups, and organizations? What were the barriers to maintaining involvement of individuals, groups, and organizations?
  6. *Context.* What factors in the organization/steering committee, community, social/political context could potentially affect either intervention implementation or the intervention outcome? How did program developers perceive the collaboration among stakeholders? To what extent can the program be sustained?
-

## **Method**

### **Participants**

Participants comprised both program stakeholders and MarketMobile program users. Stakeholders included members of the MarketMobile steering committee who were responsible for overseeing the development and implementation of the MarketMobile. Steering committee members included program developers, community leads responsible for overseeing the implementation of the program in each of the four delivery sites, and the program coordinator who was present at each delivery day. Program users were people targeted by the MarketMobile program. They were eligible to participate in the research project if they were present at the MarketMobile on service days, over eighteen years old, and if they spoke English or French.

### **Evaluation Methodologies and Procedures**

Various program components were assessed and included fidelity, dose delivered, dose received, reach, recruitment, and context as listed in Table 1. These components were defined during a steering committee meeting, using the theory of change, and stakeholders discussed how they could be assessed. There are many ways of defining and assessing such factors to evaluate program implementation and the plans were informed by Saunders et al. (2005). Fidelity refers to whether the program was implemented as planned. It included factors such as availability of the bus, availability of volunteers, availability of produce, timing, and presence of the bus in the communities every other week. Dose delivered refers to the extent to which program components were delivered to participants. It was assessed by whether the bus came and sold produce and how often. Dose received included how participants viewed the program and satisfaction with the program. Reach was assessed by gathering information on characteristics of program users to better understand who the program was serving. The program

was delivered in four communities that identified as having limited access to food geographically or financially. Recruitment referred to how the program attracted and maintained participant involvement. This included program aspects such as advertising activities and other program activities, and organizational factors, such as how the steering committee functioned. Context refers to factors in the environment that could influence program implementation and outcomes. Included in this were contextual factors specific to the different communities (e.g. urban or rural settings), as well as economic, social, and political contextual factors.

Data collection methods and tools were developed collaboratively, reviewed, and approved by the program's steering committee (see above), some of whom had lived experience with food insecurity and many of whom were long time anti-poverty advocates. This type of shared decision making with those sensitive to the needs of the participating communities can enhance implementation and contributes to collecting relevant and desired information (Durlak & DuPre, 2008). Such methods included a document and literature review, surveys completed by program participants, observation using a fidelity checklist, interviews, and a review of sales records.

The steering committee provided written and verbal feedback on survey and interview questions. Some items were changed following their recommendations. For example, a question on household income was changed to a categorical question so that participants did not have to disclose information that might have made them uncomfortable. The steering committee also provided recommendations for interview locations that would be convenient and accessible for participants. Data collection occurred throughout the pilot period because implementation of an intervention can change over time and evaluation early in the program may overestimate program implementation (Durlak & DuPre, 2008).

This study gathered data using both quantitative and qualitative methods. The following information details the procedures that were followed to gather information using each method.

**Document review.** Document review consisted of reviewing the program's weekly spreadsheet to review administrative information and within-program communications (e.g. steering committee meeting minutes, emails regarding program progress and concerns). This was done to receive feedback about the evaluation and research and collect information about challenges in program delivery.

**Survey data.** The lead researcher and a research assistant surveyed program users at one of six time points during the pilot phase of the program. We only surveyed new users at each time point. Participants were provided with a consent document outlining the purpose of the survey and description of their involvement (see Appendix A and B). The purpose of the surveys (see Appendix C and D) was to gather information on demographics, perceptions of the program, and perceptions of food access in their communities. Surveys were administered on August 9<sup>th</sup> (44 surveys completed), August 16<sup>th</sup> (39 surveys completed), September 6<sup>th</sup> (28 surveys completed) September 13<sup>th</sup> (21 surveys completed), November 1<sup>st</sup> (25 surveys completed), and November 7<sup>th</sup> (24 surveys completed). One hundred and eighty- participants completed the surveys over the course of the pilot. Participants could complete the survey independently or choose to have it read to them by the researchers. The number of participants who completed surveys independently versus having the surveys read to them was not counted. Thirty-three participants completed surveys in Carlington, forty-five in Hunt Club, fifty in Morrison Gardens, and fifty-three in Vars. Eighty percent of the participants were women (n=144), while 20 percent (n=36) were men. Most participants reported that they travelled to the MarketMobile by walking (55.8%), followed by taking a personal vehicle (32%), carpooling (5.0%), taxi service (4.4%),

and public transportation (1.7%). All survey participants reported that they bought food from the MarketMobile on the day that they were surveyed. All participants except for two reported that they would return to the MarketMobile. The two participants reported that they did not know whether they would return. No participants reported that they would not return.

In mid-September 2014, a question assessing number of people in the household was added to the survey as requested by community leads. However, 113 survey participants missed the chance to complete this item. The team planned to continue surveying until the end of December 2014 but, based on feedback from the PHWG steering committee and the MarketMobile delivery communities, it was decided that the sixth survey visit would be the last. This was due to the cold weather anticipated in December, a lack of space to complete surveys inside, and feedback from the program leads in each community that there were too few new MarketMobile users to justify administering more surveys.

Survey data is reported for the sample as a whole. A power analysis was conducted using a moderate effect size and there were not enough participants in the rural group to make precise comparisons between urban and rural groups.

**Fidelity checklist.** A program fidelity checklist (see Appendix E) was completed each week by the program coordinator, who was present during each MarketMobile delivery. The fidelity checklist included key program components that were selected by the PHWG steering committee as essential to the delivery of the program and was linked to program activities outlined in the theory of change. It is important for fidelity measures includes items that are linked to a program's underlying theory and reflects components of the intervention's protocol (Breitenstein et al., 2010). Originally, we had planned for two raters to complete the checklist but due to staffing limitations, only one person ended up completing the fidelity measure each week,

thus a measure of inter-rater reliability could not be assessed, which is a limitation in this study. The program coordinator completed the checklist each week and submitted it to the research team. Based on this feedback, suggestions for improvement were provided to the PHWG steering committee, on an ongoing basis, and incorporated into the program when possible. Changes to the checklist were made to reflect changes in program delivery.

**Interviews.** The lead researcher conducted semi-structured interviews with program users and stakeholders in each of the four communities at two time points during the pilot phase to gather information about impressions of the MarketMobile. Initially, we had planned that program users would complete interviews at three time points, but this plan changed when the structure of the program changed due to funding issues. In collaboration with the PHWG, it was decided that program users would be interviewed twice; once at the beginning of the program, and once when the program was completed in February 2015; however, the program eventually secured additional funding and continued operations throughout 2015; thus, when people were interviewed the second and final time, the program was still operating in their communities. The MarketMobile remains in operation today but the researcher's involvement with the program finished once the pilot was complete.

Participants met with the lead researcher at a location convenient to the participant and completed a consent document outlining the nature of their involvement in the research project (see Appendix F). Thirty-six program users completed interviews in the first round of interviews (see Appendix G). The purpose of these interviews was to gather information on program users' perspectives on the program and its potential impacts, their experiences regarding food access in their communities and their food situation at home. Of those thirty-six interviewees, twenty completed interviews in the second and final round (see Appendix H). Each program user

interviewee also completed a short socio-demographic questionnaire assessing gender, neighbourhood, income bracket and whether their income is sufficient to meet their needs, education, whether they were born in Canada, sense of community belonging, and number of people in the household. All interviews were conducted at locations selected by the interviewee. Interviewees were compensated with vouchers for the MarketMobile.

Stakeholders were recruited from the PHWG meetings (see Appendix I and J) to complete interviews. The interviews were guided by the theory of change and gathered information on the stakeholder's perspectives on the purpose of the program, their roles and responsibilities, the partnership between the organizations involved, beliefs about how the MarketMobile could result in change in the communities, and risks to the program achieving its goals. Stakeholders met with the lead researcher at a location convenient to the stakeholder and completed a consent document prior to the being interviewed (please see Appendix K). Seven stakeholders completed semi-structured interviews (see Appendix L and M) at two time points: once at the beginning of the program and once when the pilot phase was complete. One stakeholder could not be reached for a final interview. Each interview took approximately forty-five minutes to complete. One stakeholder was unavailable to complete an in-person interview and so sent their answers via secure email.

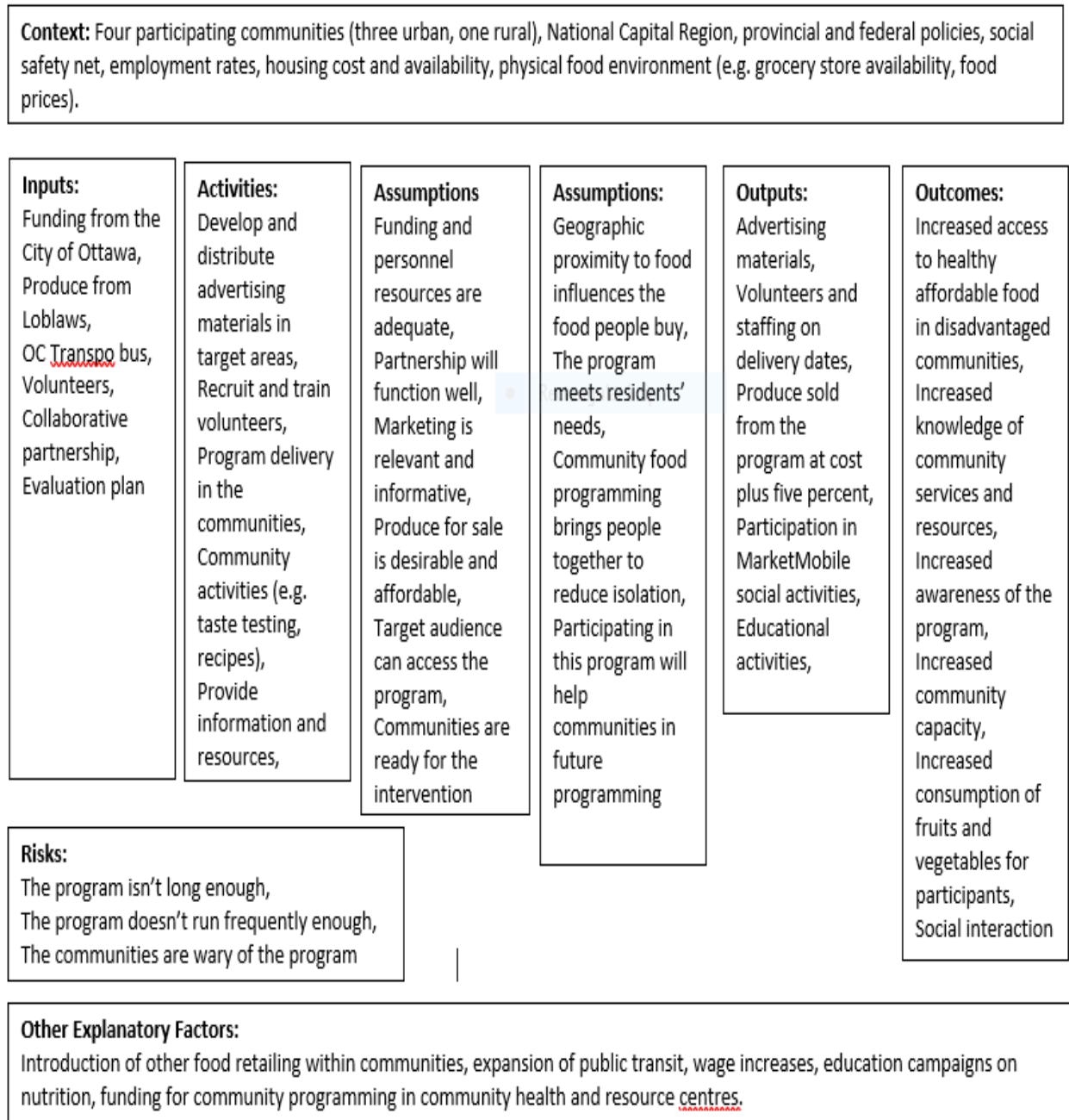
Interview content and interviewer notes were paraphrased and summarized to participants to ensure that what was being captured reflected the content accurately. Summaries of the interviews pertaining directly to the evaluation questions were presented to the steering committee. These presentations were integrated into the regular meetings held by the steering committee. The purpose of this was to discuss the findings and highlight areas that were working

well and areas for improvement, and to ensure that the information reflected the participants' views.

### **Developing the Project's Theory of Change**

The MarketMobile theory of change was developed over a series of meetings with the PHWG steering committee and a workshop attended by twenty-two people from the steering committee, program developers, community leads, and several community representatives. During the workshop, stakeholders were asked to contribute their understanding of the program's objectives and goals, inputs, assumptions, contextual factors, anticipated short and long-term outcomes, and rival explanations for outcomes. Following this workshop, the lead investigator developed a summary and a visual representation of the MarketMobile theory of change, which was shared with the workshop participants who were asked for their feedback. Only one participant provided feedback, which concerned a change in wording.

Figure 1. Theory of Change



## **Data Analysis**

Interviews were analyzed using a general inductive approach, an analytic strategy recommended for health and social science research (Thomas, 2006). The analysis followed the steps recommended by Thomas (2006). The research objectives guided the analysis and provided a focus for the analysis. The lead author transcribed most of the interviews and the remaining interviews were outsourced to a transcription company. The transcribed data files were prepared using a common format for ease of review. Once the transcripts were prepared, the lead researcher and another graduate student with experience in qualitative analysis reviewed the transcripts to familiarize themselves with the content of the text. A sample of transcripts were divided between the coders and were used to guide the coding and development of the codebook. Codes and categories that related to the research objectives and evaluation questions were defined and applied to sections of text. Text relating to food insecurity was also coded because it was useful for informing our understanding of the MarketMobile. Text that did not relate to the research objectives, evaluation questions, or to food insecurity was not assigned to any category. Thomas (2006) acknowledges that evaluation research may have specific aims and questions that guide the analysis and that this may constrain the possible interpretations of the data and argues that the approach is inductive, rather than deductive, because a specific hypothesis is not being tested. An analysis software called QDA Miner was used to organize the data. The codebook was updated and revised six times throughout this process. The remaining transcripts were divided among the lead researcher and the other graduate student and were coded. Regular meetings occurred to discuss the coding, review inconsistencies and disagreements, and to reduce overlap and redundancy among codes and categories.

Efforts were made to promote trustworthiness of the data analysis, including prolonged engagement and member checks as recommended by Lincoln and Guba (1985). Spending time in the field (e.g. being onsite during the MarketMobile, attending regular committee meetings) promoted understanding of the research context, allowed relationships between the researcher and stakeholders to build, and allowed the opportunity to confront preconceived notions about the topic under study. Member checks occurred at various stages of the research project. For example, preliminary findings were shared with participants and they asked to provide oral feedback. This provided an opportunity to correct errors in interpretation. Summaries were provided at the completion of the interviews and participants were invited to provide feedback and corrections to interpretations. Ongoing discussions with the research team, including stakeholders, were used to revise the research materials to collect relevant data and update the codebook to refine the analysis.

### **Results**

We first present the theory of change model, followed by the results from the surveys, and then the findings from the interviews with stakeholders and MarketMobile participants.

#### **Fidelity**

Fidelity checklists were completed on thirteen program delivery dates to track whether the program was being implemented as planned, areas in which it was not, and to receive feedback about issues in implementation. The checklists were not completed for the final two weeks of pilot delivery as resources and time were limited. Overall, feedback suggested that the program was implemented as planned: the MarketMobile consistently delivered fresh produce to each of the communities on the allotted days, offered additional resources and activities for health promotion, was on time, and was generally adequately staffed.

Challenges in implementation were also identified. Obtaining and providing enough food for customers was a challenge early in the pilot. For example, the program ran out of food on the first day at the second site and returning to Loblaws to re-stock. Timing was a challenge. For example, The MarketMobile was late arriving to the rural site twice, and this was due to orders not being ready in the morning and to a change in delivery location. The MarketMobile was late arriving to one urban community once as the food was not packed and ready for pick-up at Loblaws in the morning. On three occasions, the food was not prepared and ready at Loblaws to be loaded onto the bus. To address this the program coordinator started calling Loblaws the day before delivery to confirm the order. The MarketMobile sold most to all produce during its delivery. The food supplier was also late on occasion, which interfered with punctual program delivery. The program was “shorted” certain food orders on seven dates (i.e. Loblaws did not include certain item that the program ordered or included a reduced number of items). Once, one food order (i.e. kale) was not “fresh” and so was not purchased by the program. Additionally, the supplier occasionally changed the order (e.g. organic strawberries were swapped for non-organic) and so the program could not offer the produce it advertised. The fluctuating numbers of volunteers in the communities and on the bus was another challenge. For example, on one of the dates, there were no community volunteers present at one urban site. Otherwise, there were at least two volunteers (and sometimes as many as eleven) in addition to the program coordinator, on the bus. Program developers adapted the program over the course of the pilot to respond to challenges in implementation and put practices into place to improve program delivery, which improved aspects such as program timing and quantity and type of produce being sold.

## Survey Results

**MarketMobile: Reasons for visiting.** Data was missing for 45 participants (24.9% of the total sample) for the items assessing reasons for visiting because these questions were added after the first round of survey administration. Many participants (42.2%) either Agreed or Somewhat Agreed with the statement that they visit the MarketMobile to meet other community members. About 45.2% of participants Somewhat Disagreed or Disagreed with this statement. The remaining participants (12.6%) neither agreed nor disagreed.

Most participants Agreed (87.5%) or Somewhat Agreed (8.8%) that they visit the MarketMobile to buy fruits and vegetables at a more affordable price than where they usually shop for food. Two participants reported that they Disagreed with that statement. Three participants reported that they neither agreed nor disagreed with that statement.

Reports were mixed on whether participants visited the MarketMobile to buy fruits and vegetables that are important for their culture. Most participants reported that they Agreed (32.0%) or Somewhat Agreed (9.4%) with this statement. Many participants Disagreed (17.1%) or Somewhat Disagreed (1.1%) with this statement. Some participants (15.5%) reported that they neither agreed nor disagreed.

Reports were mixed on whether participants visited the MarketMobile to learn more about other programs in their community. Some participants Agreed (25.4%) or Somewhat Agreed (14.4%) with the statement that they visit the MarketMobile to learn more about other programs in their community. Slightly fewer participants either Disagreed (19.3%), Somewhat Disagreed (7.2%), or neither agreed nor disagreed (8.8%) with the statement.

Most participants Agreed (54.7%) or Somewhat Agreed (6.6%) with the statement that they visit the MarketMobile because its location is more convenient than where they usually

shop for food. Some participants reported that they Disagreed (8.3%) or Somewhat Disagreed (1.7%) with this statement. The remaining neither agreed nor disagreed (3.9%).

**MarketMobile: Implementation.** Nearly all participants (95.6%) rated the location of the MarketMobile as Good or Very Good. Several participants reported that they had no opinion about the location (4.4%). All participants reported that the MarketMobile staff and volunteers were Helpful (6.6%) or Very Helpful (93.4%). Participants appeared satisfied with how the program was organized, with most rating it as Organized (24.9%) or Very Organized (72.9%). Some participants (2.2%) reported having no opinion on program organization.

**MarketMobile: Produce.** Participants appeared satisfied with the quality of produce for sale. Most participants reported that the quality was either Very Good (72.4%) or Good (26.5%). One participant reported having no opinion on quality of produce, no-one reported that the quality was bad, and data was missing from one participant. In terms of cost, most participants reported that the food was Affordable (54.7%) or Very Inexpensive (43.1%). Two participants reported that the food was Too Expensive, and one participant had no opinion on the cost of food. Participants were satisfied with the variety of food for sale at the MarketMobile. Most reported that they were Very Satisfied (52.5%) or Satisfied (40.3%) with the variety. Nine participants had no opinion on the variety of food for sale. Two participants were Unsatisfied with the variety and one participant reported being Very Unsatisfied. Data was missing from one participant.

*Table 1. Demographic characteristics of participants overall*

Variable	Overall	
	N	%
Gender		
Male	36	20
Female	144	80
Living Arrangement		
Living alone	23	12.8

Living with spouse or partner	42	23.3
Single parent with children	34	18.9
Two parent family with children	46	25.4
Living with parents, other family, or friends	22	12.2
Other	12	6.7
Prefer not to say	1	0.5
Number of people in household		
One person	7	10.3
2-5	54	79.4
6+	7	10.3
Length of time in Canada		
Since birth	133	76
More than 10 years	30	17
5-10 years	5	2
Less than 5 years	7	3
Education		
Some schooling or completed elementary school	9	5
Some high school	16	8.9
Completed high school	34	18.9
Some post-secondary	19	10.6
Completed post-secondary	80	44.4
Master's, doctorate, or professional training	19	10.6
Other	2	1.1
Don't know	0	0
Prefer not to say	1	0.5
Health problems that make it hard to get around		
Yes	47	26.1
No	133	73.9
Own a car		
Yes	108	60
No	71	39.4
Transportation for grocery shopping		
Personal vehicle	104	57.8
Taxi service	5	2.8
Public transport	52	28.9
Bicycle	2	1.1
Walking	11	6.1
Carpool	6	3.3
Income sufficient		
Always	46	25.6
Mostly	51	28.3
Sometimes	49	27.2
Rarely	21	11.7
Never	12	6.7
Missing	1	0.5

### Program Customer and Developer Perceptions of Program Implementation

Below is a summary of key findings from the interviews with program customers and program developers. Themes and categories are listed in the table below. In a general inductive approach, themes are overarching concepts closely connected to the research questions, while categories are specific ideas or topics within each theme. For example, the theme “who used the program?” provides information on participant characteristics and how they matched with the program’s intended audience. Within the theme “how the program was received”, the categories reflect specific elements of the program and how they were perceived by users and program developers. The theme “what went well and what could have gone better” includes categories that shed light on program strengths and weaknesses. The theme “community context” addresses contextual factors that may have influenced program implementation. Within the theme “sustainability”, the categories provided information about what sustainability looks like for the MarketMobile and whether it is important or feasible.

Table 2. List of themes and categories from general inductive analysis

Thematic Area	Categories
Who used the program?	<ul style="list-style-type: none"> <li>- Perceived food access</li> <li>- Shopping practices</li> </ul>
How was the program received?	<ul style="list-style-type: none"> <li>- Program design elements</li> </ul>
What went well and what could have gone better?	<ul style="list-style-type: none"> <li>- Program resources</li> <li>- Program development and collaboration processes</li> <li>- Research and evaluation</li> </ul>
Community Context	<ul style="list-style-type: none"> <li>- Program fit</li> <li>- Previous program experiences</li> </ul>
Sustainability	<ul style="list-style-type: none"> <li>- Definition/desirability/importance</li> <li>- Relevance for social program</li> </ul>

### **Who Used the Program?**

**Perceived food access.** Stakeholders reported that the participating communities lacked accessible and affordable food retailers. Within the urban communities, stakeholders reported that many of these residents lived in poverty and had single parent status. In the rural community, stakeholders identified a lack of a grocery store, distance to food retailers, limited public transportation, high numbers of senior citizens, and some lower-income residents as rationales for the program placement there.

All rural participants reported that they were able to buy enough of the food that they and their families want and need to eat. One rural participant reported that they occasionally limited the amount of fruit they bought in order to make their budget work

Reports were mixed among urban participants. While some urban participants reported that they were able to buy enough food for themselves and their families, others reported that they were unable to buy enough food for themselves and their families and that they went without food, cut down on other household necessities, or relied on food banks. Some noted that their ability to access food changed throughout the month, depending on when they received a social assistance cheque or a paycheque. Consistent with the food insecurity literature, finances were the main reason cited for difficulty obtaining enough food. Distance, lack of transportation, and health conditions also contributed to difficulty in obtaining enough food.

Despite many participants reporting difficulty obtaining food, there were multiple reports of participants being unsure of whether the program was “for them.” Some urban residents also reported uncertainty about whether they should be using the program and felt that they were not “poor enough.” Even participants who perceived themselves as needing the program often discussed that others who they thought could use it more. Many participants reported that the

program was helpful for them and believed that it would be even more helpful for others. Rural participants generally reported needing the program to address geographic barriers to food access, rather than financial barriers.

Most customers reported that being able to shop for food in their neighbourhood was important to them. Urban customers reported that this would help them save money on transportation, which they could use toward their food bill. Most rural customers reported that being able to shop for food in their own neighbourhood mattered to them; however, some of these customers reported that they did not expect to have such services living in the country.

- “Well you know we moved to the country, so I don't expect all the amenities right at my doorstep.” (Rural participant)
- “Yes, but I kind of realized moving out here that that wasn't going to be an option. You know, I've lived out here for 20 years, 24 years, so I realized living out here that the grocery store is far away.” (Rural participant)

### **How was the Program Received?**

#### **Program Design Elements**

**Advertising.** Many customers across the communities reported that they liked the way the program was advertised. They liked the fact that it was colourful and provided important information (e.g. dates and locations). Some reported that it was helpful that MarketMobile volunteers distributed door hangers advertising the program because these also answered questions and clarified the purpose of the program to potential customers. Some customers reported that they had not seen MarketMobile advertising and had heard about the program through word of mouth or they reported that they “just walked by.”

Some customers had not seen anything they considered to be advertising the program and reported that it should be more widely advertised. Others, primarily in the rural community, reported confusion about the purpose of the program based on the way it was advertised. For example, one rural resident stated:

“You know it kind of piqued my interest because the first advertisement I read about it, I thought ‘My gosh, it sounds like we're in an under privileged area.’ And I've never thought of us being that way.” (Rural participant).

Some customers reported that it was important to clarify the purpose of the program and its intended audience. They reported that there could be confusion because it is such a novel program. “If you say, "A bus with food on it," people don't understand. What could be on this bus? If they actually see the bus with fruits and vegetables, and that is what catches people's attention” (Urban participant).

**Location.** Most customers reported that the MarketMobile location was convenient and several stakeholders reported belief that “people are using it because it’s close” (Stakeholder). None reported dissatisfaction with the location nor suggested improvements for the locations. The customers may have been people who lived nearest the MarketMobile within each community. Most participants reported that the location allowed them to walk and save money on transportation. One rural participant stated: “you do not have to use a car, seniors can walk to it.” Some customers reported that they lived so close to the MarketMobile that they made multiple trips to the program in one day (e.g. buying food, dropping it off at home, and returning to buy more that they could not carry in the first trip).

**Frequency and Timing.** Participants reported mixed views on the frequency and timing of the MarketMobile. Several participants from both urban and rural communities reported that

they would like to see the MarketMobile in their community each week. Some urban customers and a stakeholder noted the importance of program timing. For example, some customers reported receiving their social assistance cheques near the end of the month and that this did not line up with the MarketMobile schedule in their community. Some urban participants reported that they were satisfied with the frequency of the program and reported that they were just happy that there was something coming to their community on a consistent basis.

Most stakeholders recognized that the timing of the program had implications for customers who relied on social assistance. They believed that this could be a barrier to use. As one stakeholder stated: “Maybe if we're not able to ever have it on the weeks where people have money, like you know what I mean. The way we have it right now, the other sites get it when people are going to have more money than we do. We get it every second week. So that's another thing to consider.”

**Infrastructure.** Some customers, who self-described as having mobility limitations, reported that the MarketMobile infrastructure was not accessible for them. For example, several customers using wheelchairs reported that they were unable to go on to the bus to select their produce. Some customers with limited mobility said that they found it difficult to mount the steps into the bus. In these instances, efforts were made to have a volunteer do the shopping for these customers; however, a reported advantage of the MarketMobile was that customers could select their own food, which customers noted contributed to a sense of control and autonomy, often lacking in food programming (e.g. food banks). Customers who were unable to enter the MarketMobile might have missed that.

Several customers reported that it was “cramped” on the bus and that this was a drawback, but not enough of a deterrent to stop them from returning. Other customers noted that

they appreciated that only a few customers were allowed on the bus at any given time, to manage lack of space. This feedback was consistent across urban and rural settings. Additionally, some participants reported concerns about safety while climbing the steps to the bus. This feedback was given to the program developers who made a modification to improve safety.

All stakeholders reported that weather was a concern, particularly when the weather got colder into December. They suggested using portables, a school gym, and a church, to mitigate such concerns and encourage program participation.

**Resources/services/activities.** Customers reported mixed views on the other resources and activities offered during the MarketMobile delivery days. Health promotion information and resources were offered. Other community services (e.g. Ottawa Public Health dieticians, the Ottawa police) were often present on-site during delivery dates to provide information and educational opportunities. Some customers reported that they were unaware of this and that their knowledge of other community programs and services did not change throughout their use of the MarketMobile. When customers reported awareness of such activities, they usually referred to recipe and food demonstrations and taste testing offered on site. Customers generally reported positive feedback about activities for their children offered at the program and noted that this made their shopping experience easier and reduced stress around managing shopping with young children.

**Produce.** Most customers reported that they were satisfied with the price of produce for sale at the MarketMobile. In fact, this was the main reason why customers reported using the program. Most customers also spoke positively about the produce for sale at the MarketMobile. After price, the quality of the produce was a major reason why customers were satisfied with the MarketMobile and wanted to return. Some customers reported that they were unable to find

certain items they wanted and offered suggestions for produce to add to the bus. Some customers expressed a desire for local produce and that they wanted to support local farmers and the local economy. Many customers reported that they wanted the MarketMobile to offer a wider variety of foods and products (i.e. grains, meats, baking supplies, and heavier items that are more difficult to transport, such as laundry detergent).

**Program staff and volunteers.** All customers reported satisfaction with the program staff and volunteers who were present during the MarketMobile delivery. None reported a negative experience. Customers reported that the staff and volunteers were friendly, helpful, and created a pleasant and fun atmosphere. Some customers reported that the staff and volunteers were able to answer questions about what certain produce items were and how to prepare them. A key finding reported only in the urban sites was that customers reported that the staff were non-judgemental. Some urban customers reported that they have had experiences with other models of food provision, such as food banks, where they perceived stigma and judgement. They reported often experiencing a sense of shame or embarrassment when using charitable models of food provision and limited selection of food of lesser quality.

Some stakeholders echoed this and noted that one difference between the MarketMobile and the food bank is that anyone can use the MarketMobile, whereas at some food banks, documentation demonstrating financial need is required.

### **What Went Well and What Could Have Gone Better?**

**Program development.** Most stakeholders reported that it would have been helpful to have more time to develop and implement the program. They noted that the funding was provided and a sense of pressure to deliver quickly, and that it was important to make use of the funding without compromising the quality of the program.

“I really think that like the community sector, we just sort of are like "well okay, we'll take what we can get." because funding is so hard, and to get it it's limited. But sometimes I think that can happen to the detriment of actually just doing things properly and taking our time to make sure that we set up a strong foundation and we do things right” (Stakeholder).

**Collaboration.** Most stakeholders reported that the collaboration among team members, communities, and partners went well. Members reported that there was adequate representation of stakeholders but that it might have been helpful to have “big players” at the table. For example, one member believed it was important to have representation from organizations capable of making decisions about continued funding and sustainability but did not identify specific examples.

In terms of what could be better in the collaboration, most members noted the importance of staying on track, making decisions, and working on tasks that were within the “mandate” of the steering committee rather than focusing on logistic and operations decisions that were better addressed by the sites themselves. Most stakeholders reported that participation was encouraged. Stakeholders reported that what worked best was the enthusiasm and dedication that the team had. Most stakeholders reported that it had not been difficult to recruit people for the team. They also reported that this was a meaningful project that people were excited about and wanted to take part in. As one stakeholder stated: “people are stepping up, interested in partnering compared to other experiences where it is more difficult to get people out.”

Several stakeholders reported that working with Loblaws, while beneficial, was also challenging at times. For example, as noted above, some stakeholders reported that orders were

occasionally not ready for pick-up on delivery days or that certain foods were not included with the order.

**Research.** Some of the stakeholders reported on benefits and drawbacks of the research and evaluation component of the program. For example, benefits included thinking more deeply and critically about the program's purpose, goals, and mechanisms. At the same time, some program developers reported that it was challenging to participate in the research and evaluation because of limited time and resources.

### **Sustainability**

Participants across the communities reported that they wanted the MarketMobile to continue. Many said that they hoped it would be introduced into other communities as well, particularly where they perceived a need. For example, they noted that the program should be delivered in communities characterized by low-income and where people may have vulnerability factors for food insecurity (e.g. participants identified that elderly people, people with limited mobility, and communities where there are single mothers and children may be particularly in need).

Stakeholders discussed MarketMobile sustainability in terms of what it would "look like." For example, one stakeholder discussed sustainability in terms of "promising practices" for other types of programming, where the MarketMobile could offer "lessons learned" for similar settings. Another discussed the importance of considering sustainability within a social program and how this is different from sustainability in a business.

"I don't think we're ever going to be sustainable in terms of the food selling supporting the whole project. But I don't think that we need to be sustainable in that way, because this is a social program. It's not a business" (Stakeholder).

They reported that there is a tension between maintaining the program mandate and keeping food affordable, while also generating resources to keep the program going. Some stakeholders reported that they felt pressure to show that the program should continue before the pilot was complete, and that they just wanted to get through the initial round of programming.

“We need to break even at the end. If we're losing money every week, I don't see any people that issue grants to be like "oh, we're going to support this program even though you lose \$300 every week” (Stakeholder).

A few stakeholders discussed a need to be careful with offering programming in communities because of the expectations it creates for community members. They connected the idea of continued programming to building trust within communities where programs are often implemented and then “fall through”, making community members less likely to engage in future programming. They also shared ideas about what needs to happen for the MarketMobile to continue operations, such as securing grants and funding, building a strong and reliable volunteer base, and obtaining their own bus or trailer to cut down on the cost of renting the OC Transpo Bus.

In the rural community, MarketMobile sustainability was discussed in terms of it leading to other opportunities that would promote food access, such as the implementation of a regular farmers' market or permanent grocery store in the community. Offering an experience beyond fresh fruits and vegetables was identified as a factor that could promote a sustainable source of food in a community where most of the participants were not limited by finances. One stakeholder noted “it has to be broader than just bringing fresh fruits and vegetables or broader than just eating well...it has to be a social thing. We have to put a social spin to it.”

Some stakeholders reported that continued programming could be encouraged through fostering the Market Mobile's image. Many customers reported attending because they were curious, that it sounded interesting. Many stakeholders reported that "people want to be a part of this" program. They noted that it is new, unique, and a "feel-good venture." Furthermore, it received media attention and was supported by local councillors. Some stakeholders reported that, because of this, it facilitated buy-in from other partners who could contribute to the program's expansion and sustainability.

"For this community, the example I'm using is that we don't have businesses in this community. We have a pizza shop. That's all we have. But, what I noticed is that the owner of the pizza shop would serve us coffee free of charge. So the notion is then, it was easy for partners to buy in and think "ok this is a good deed, this is a feel good venture. And we want part of it." (Stakeholder).

### **Community Context**

**Program and community fit.** Some stakeholders talked about the importance of fit between the community and the program. This was characterized by the community demonstrating need for the program but also and expressing interest in the program and having the capacity to implement the program. For example, stakeholders stressed the importance of having community leads and a strong volunteer base within the community to support program delivery.

Stakeholders stressed the importance of community ownership of the program as a way of promoting "buy-in" and "ownership" of the program. They reported that community consultation was important to recruit volunteers, promote the initiative, and to address logistical challenges on site.

**Previous program experiences.** Stakeholders and program users discussed how past experiences with programs in their communities could influence participation at the MarketMobile. They talked about programs being introduced and then subsequently discontinued due to lack of funding and investment and how this can lead to a lack of trust in future programming and lack of engagement. Some participants reported being reluctant to use the MarketMobile in case it was discontinued. Additionally, stakeholders and customers discussed past experiences with other kinds of food provision services, such as food banks and other alternative food program models, and how this could influence use of the program. For example, one stakeholder mentioned that “there were people who have had previous, like Good Food Box experience in good food markets and they weren't impressed with the quality of the food so they didn't come to the Market Mobile.”

### **Discussion**

The findings from this study provide important information on the implementation of a novel food security intervention delivered in urban and rural Ottawa communities. Such findings contribute to our understanding of program strengths and weaknesses, contextual considerations, and may have implications for program development for similar interventions implemented in settings that have limited access to food. The discussion is organized by the evaluation research questions.

#### **1. To What Extent was the MarketMobile Implemented as Planned? To What Extent Were Intended Components Delivered to Participants?**

The pilot program ran from July 2014 to May 2015 after the group secured a grant for additional funding to prolong the pilot. The program was occasionally delivered in an incomplete manner when items were shorted, the MarketMobile was late arriving on site, and when the

program ran out of certain food items at the first site and did not have enough for the second site. This was recognized by stakeholder and program users. Customers reported dissatisfaction when there was not enough produce and when the program was delivered on dates that did not coincide with the receipt of social assistance cheques. Stakeholders anticipated that aspects of the program would change over time and that it was important to maintain a balance between flexibly responding to participants' needs while also emphasizing reliability and consistency in program delivery as important factors for maintaining an invested customer base.

Program fidelity is linked with improved outcomes (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Although programs should be adaptable and flexible, particularly in response to weaknesses, it is problematic if a program diverges from the plan to the point where program quality is negatively impacted. There were many aspects of the MarketMobile program that were implemented as planned. It regularly delivered fresh and affordable produce to four Ottawa communities and provided information and resources about other services and programming in the city. There were some areas where the program's fidelity was compromised; including running out of food, occasional lateness, being shorted on orders, fluctuating volunteer numbers, and logistical challenges. In response to feedback from stakeholders, community leads, and program users, the program was modified to address such challenges. A limitation of the assessment of fidelity in this study is that only one rater was able to complete the checklist, due to resource and staffing limitations. As such, we could not calculate a measure of reliability.

Previous research has identified contextual factors that reduce program (Breitenstein et al., 2010). Such factors include frequent volunteer and staffing changes and turnover, lack of time and resources to support training, and other demands on staff that presented challenges to program delivery. All these factors were at play in the current research project. It would be

beneficial to determine how to best engage staff and volunteers and to learn what they need to support their roles in implementation.

## **2. How Did Participants React to Specific Aspects of the Intervention? Do Participants Intend to Continue Using the MarketMobile? Why or Why Not?**

Overall, participants reported that they enjoyed the MarketMobile, planned to return, and were satisfied with many program elements, particularly the prices and location convenience. Most used the program over the course of the pilot and wanted the program to continue in their communities and in other communities in the City. Many participants reported that they were treated respectfully and non-judgmentally by program staff and volunteers. They also reported that they continued to use the program because it was a “fun activity”. The positive interactions with program staff and volunteers that participants described is a strength of this program and could be a lesson learned for future programming. People who are food insecure may be constrained in their ability to participate in social leisure activities and experience emotional and social health consequences such as stigma (Runnels, Kristjansson, & Calhoun, 2011). Identifying specific aspects of staff and volunteer practices that promote engagement and program use is an area for future study (Fixsen et al., 2005).

## **3. What was the Reach of the MarketMobile? What Were the Characteristics of Program Users? Were they Representative of Those Most at Risk for Food Insecurity?**

Participants in all three urban areas reported more financial challenges accessing food than their rural counterparts. Some urban participants reported difficulty obtaining enough food and implementing strategies to make their food go further (e.g. cutting down on certain items, skipping meals). This is consistent with some strategies reported by people who are food insecure. In the rural site, participants’ economic status was not representative of those most at

risk for food insecurity. The socioeconomic context may be an important factor that could explain such differences, rather than the urban and rural difference. This could be a limitation in the program's reach or the research study's recruitment procedures, given that, at the time of the study, the rural community had a low-income prevalence of 5.1% (Ottawa Neighbourhood Study, 2015). Program elements such as low-cost produce may not be enough to address barriers that may prevent people who have lower income from participating in these programs.

Additionally, although urban residents with lower income participated in the program, rural residents of lower income may have unique barriers to participation, or the program may not have included elements that met their needs.

The rural community had the lowest unemployment rate, the lowest prevalence of newcomers to Canada between 2011 and 2016, and the lowest prevalence of single-parent families, all of which have been linked to higher likelihood of being food insecure, when compared with the urban communities in this research. Urban participants discussed these factors as influencing their ability to obtain adequate food. Additionally, one of the urban sites was near a seniors' residence. Although risk for food insecurity is lower once people qualify for old age security, older people may face unique barriers to accessing food or participating in community food programs, especially if they are limited by mobility issues (McIntyre, Dutton, Kwok, & Emory, 2016). Although this research did not include non-users of the program, it may be important to assess these socio-demographic and economic factors and their influence on program use. Participating in this program might be difficult for people who have limited resources (e.g. financial constraints, time constraints), particularly as people would be unable to do all their grocery shopping at the MarketMobile.

Some stakeholders reported that the reach of the MarketMobile was limited. Stakeholders pointed to number of purchases per market date as a metric of reach, averaging fifty sales per market date. Given the populations within the participating communities, as defined geographically by the Ottawa Neighbourhood Study, stakeholders believed the average number of purchases was low. However, representativeness of target audience, rather than the absolute number of sales or program participants, provides important information about program reach (Glasgow, Vogt, & Boles, 1999). It is important that a program intended to improve food access attracts participants for whom this is a challenge. In the urban communities, an indicator of program success was that most MarketMobile program participants reported that they experienced barriers to accessing healthy and affordable food. Although being food insecure was not a requirement of participation in the MarketMobile program, future research on program reach in mobile food markets could investigate the proportion of people who are food insecure within target communities who participated in the program. Factors that could explain limited reach are program timing, community member uncertainty about the program's purpose and intended audience, and poverty. Consulting with community members about their needs and potential improvements to programs to meet them is an area for future study.

#### **4. What Procedures Were Used to Attract Participation of Individuals, Groups, and/or Organizations and to Encourage Their Continued Involvement? What Were the Barriers to Maintaining Involvement?**

Stakeholders discussed the importance of fostering community “buy-in” and ownership of the program by consulting with community members and involving them in the process of developing and implementing the program. Buy-in and stakeholder involvement are essential aspects of program implementation; however, literature on how to best achieve buy-in as a

method of promoting implementation is limited (Fixsen et al., 2005). Past experiences with programming may influence buy-in. In communities where programs have been implemented and then discontinued, it may be difficult to build trust and promote participation in the program. Indeed, some program participants expressed reservations attending the MarketMobile, in case it was withdrawn from their communities. This may be a barrier to continued involvement in the program, which could be addressed by continued community involvement in the direction and development of the program. Including community residents in decision making about the program and getting their feedback about the program and whether it meets their needs could have the benefit of promoting involvement in the program.

The novelty of the program appeared to be a factor in engaging participants. The advertising activities appeared to draw people to the program; however, some participants reported being unsure whether it was for them because they did not perceive themselves as being in need. More explicit information about the program, its intended audience, and its purpose may be useful in encouraging continued participation. Additionally, one stakeholder emphasized the importance of putting a “social spin” on the program, particularly for the rural community, as a way of increasing engagement. Given that participants from the rural community reported having few activities and services available within their community, and reported no financial difficulty obtaining food, a program that offers discounted produce may not be relevant or engaging, especially if people still have to drive far distances to access other food and goods. Similar programs implemented in rural communities with similar socio-demographic profiles may consider adding other components, such as a wider variety of foods, social activities, and in-demand resources. This may be beneficial to attracting and maintaining community involvement.

**5. What Factors in the Organization/Steering Committee, Community, Social/Political Context, Could Potentially Affect Intervention Implementation? How did Program Developers Perceive the Collaboration Among Stakeholders?**

Program stakeholders identified many factors that could potentially affect the MarketMobile's implementation and outcomes. Reliability was an important factor cited by stakeholders and participants to encourage continued participation.

Organizational factors, such as a clear understanding of committee roles, representation of stakeholders, an open and supportive atmosphere, are important in collaboration and in promoting program implementation. Overall, as noted above, the collaboration between different stakeholders was described positively; however, there were areas for improvement, such as having a clearer understanding of committee roles and purpose and including representation from organizations that have decision making power. Community collaborations can be difficult to develop and sustain, as they rely heavily on volunteers, and members from different groups may have conflicting priorities (Merzel & d'Afflitti, 2003). Importantly, a strength of the MarketMobile program was that committee members reported satisfaction working on the project, remained on the project for the duration of the pilot, and other businesses expressed interest in contributing to the program.

Stakeholders reported that participating in the research and evaluation of the MarketMobile was beneficial. The participatory research approach adopted in this study may have contributed to this. A participatory approach allowed participation in developing and implementing the evaluation, and most stakeholders reported that it encouraged them to think critically about the program. Using a participatory research approach to develop the theory of change and the evaluation may be particularly helpful in food security intervention research

because of the alignment with the missions and commitment of food insecurity programming, such as the MarketMobile. This also helps to understand the context in which these interventions are delivered, and so that the community can have an influence in the projects and policies that affect their lives. Both stakeholders and participants contributed greatly to this project, by sharing their time and experiences; however, participating in research and evaluation can be burdensome for stakeholders and participants (Linnan & Steckler, 2002). Consistent with this, it was occasionally difficult to obtain feedback about evaluation findings, which could reflect the resource intensive nature of implementing this program.

### **6. To What Extent can the Program be Sustained?**

All respondents reported that they wanted the program to continue. Modifications to the program were suggested to promote sustainability, including staffing, infrastructure, and products. Such modifications would likely require additional financial resources, which may be challenging for a program relying heavily on grant funding. Raising the price of the produce would be a way of promoting financial sustainability but would be inconsistent with the PHWG mandate to address food insecurity and poverty. At the end of the pilot, several stakeholders noted that one way of addressing this would be to adopt a social enterprise model although they noted that this was unlikely to be pursued in the near future and were unsure how this could be done. In social enterprise models, profits are reinvested into the social mission or cause of the program. Social enterprises may be effective but can also have difficulty ensuring financial sustainability (Santos, Pache, & Birkholz, 2015). Social enterprise addressing food insecurity is a growing area; to our knowledge, there is one case study evaluating the impact of social enterprise on food insecurity in Australia and it successfully sold food for 40% less than what was available at nearby retailers (Lindberg et al., 2019).

### **Strengths and Limitations**

This study has several strengths, such as using a participatory approach, involving stakeholders in the planning and execution of the research, and including the perspectives of both program developers and participants. This study has several limitations. First, the findings reflect only the perspectives of participants who attended the MarketMobile at least once and agreed to complete interviews and surveys. Participants were approached via convenience sampling after they exited the MarketMobile. The program may have been attended by people who lived close to the delivery site and could afford the available produce, thus positively biasing their responses. They may have had attributes that influenced their willingness to participate in this project. As such, the representativeness of the findings may be limited. Additionally, demand characteristics during the interviews may have influenced participants to provide answers they believed the interviewer expected, and, participants may have provided biased answers based on their knowledge that they were partaking in a research study. Efforts were made to include stakeholders and participants and to receive feedback about the findings. Feedback was occasionally difficult to obtain and may reflect the lack of time and resources participants had to invest in follow-up activities. Another limitation was that there was only one person assessing program fidelity. Therefore, comparisons of consistency in delivery could not be made.

Another limitation is that we only conducted the surveys and interviews in English and French, due to limitations in resources. The communities in which the MarketMobile was delivered are diverse and multicultural. Indeed, many people who completed surveys reported that they were born outside of Canada. As such, the findings would not reflect the perspectives of people who may have used the MarketMobile but were not proficient in English or French.

### **Conclusions**

This was an applied research study on a community food security program developed and implemented in Ottawa and makes important contributions to the literature. First, a significant contribution was that this research used a participatory research approach to better understand the MarketMobile program. Stakeholders reported thinking critically about the program and its mechanisms of change. This is beneficial as previous research suggests that program developers may have stereotypes, biases, and inaccurate beliefs about what make food insecurity programs helpful or attractive to intended users. Second, constructing the theory of change collaboratively, with stakeholders, and involving stakeholders at various stages of the research project contributed to the program and research project. This approach was aligned with the mission and values of the organization responsible for implementing the MarketMobile.

Second, given that research on food insecurity programs, particularly mobile food markets, is limited, this project provides valuable information on factors that were important in the process of implementing a novel food insecurity program. The findings further our understanding of process factors that may influence how outcomes are achieved, which is especially important in food security intervention research given previous research suggests these programs have little impact on food security status. Specifying processes involved in program development and implementation will promote strategies to enhance food insecurity programs to benefit users. Indeed, process factors from this study highlight the importance of assessing components such as reliability and consistency of delivery, program fit with community and community ownership, collaboration, and factors that promote sustainability. Future research should focus on best approaches to fostering community engagement in food security initiatives and assess barriers that might prevent rural residents who have lower incomes from participating in programming and research.

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**Perceived Outcomes of a Mobile Produce Market in Urban and Rural Communities**

Platts, J., B.A.<sup>1</sup>

Kristjansson, E., Ph.D.<sup>1,2</sup>

Enns, Aganeta., M.Sc.<sup>1</sup>

School of Psychology, University of Ottawa<sup>1</sup>

Institute of Population Health, University of Ottawa<sup>2</sup>

### Abstract

Diets inadequate in fruits and vegetables are a strong risk factor for chronic disease. People who have difficulty obtaining adequate diets are often constrained by limited financial resources and may live in areas with poor geographic access to grocery stores. A mobile food market called the MarketMobile was developed to address these challenges and their implications. The MarketMobile was piloted in Ottawa in three low-income urban communities and one rural community between July 2014 and May 2015. This study investigated the perceived outcomes of this intervention from both participant and stakeholder perspectives. Semi-structured interviews were conducted at two time points over the course of program delivery with both MarketMobile participants (n=37 at baseline) and stakeholders (n=10 at baseline). Interview data were analyzed using a general inductive approach (Thomas, 2006). Findings suggest that participants benefitted from the program and that there were differences in how urban and rural participants believed that the program impacted them and their communities. The participants and stakeholders described benefits across nine main areas including financial, physical, psychological well-being, knowledge of other programs and resources, family involvement, social interaction, sense of community involvement, community capacity, and perceptions of community. Program impacts on stakeholders and perceived lack of impacts were also described. Overall, there were few differences in how participants and stakeholders perceived the program's outcomes. The findings suggest that the MarketMobile is a promising intervention for addressing issues related to food insecurity. As an increasing number of mobile food markets are implemented across North America, future research should be done to confirm these findings, investigate the program's impact on food insecurity, and identify how program elements may contribute to health disparities related to food insecurity.

### Perceived Impacts of the MarketMobile in Urban and Rural Ottawa Communities

Chronic disease, including cardiovascular disease, diabetes, and cancer, is the leading cause of death in Canada (Statistics Canada, 2018). A primary risk factor for the development and worsening course of chronic disease is the lack of an adequately nutritious diet (Tugault-Lafleur & Black, 2019). The Global Burden of Disease studies reported that inadequate nutrition is responsible for more deaths globally than any other risk factor (Afshin et al., 2019). A staggering 11 million deaths worldwide in 2017 were attributed to the consumption of unhealthy food (Afshin et al., 2019). Furthermore, estimates suggest that the costs of diet related disease, including both direct and indirect costs, are 13.8 billion per year in Canada (Lieffers, Ekwaru, Ohinmaa, & Veugelers, 2018). It is well understood that diets rich in foods such as fruits and vegetables, whole grains, nuts, seeds, and milk, are protective against chronic disease and reduce the risk of many health conditions, including cardiovascular disease and cancers (Wang, et al., 2014). Unfortunately, the vast majority of Canadian adults fall short of the recommended daily amount of these disease-protective foods (e.g., fruits and vegetables). Fruit and vegetable consumption is lower among those who are food insecure (Stats Canada, 2017a), in the lower income quintiles (Statistics Canada, 2018) and among people with lower than post-secondary education (Statistics Canada, 2018). Interventions designed to improve dietary quality are one strategy to prevent chronic health conditions and reduce the economic burden of disease.

One reason for insufficient dietary intake of fruits and vegetables is inadequate access to such foods. Food insecurity exists when people lack access to enough healthy food. Financial limitation is the main reason why people are food insecure but other factors act as barriers to food access, including geographic unavailability (Tarasuk, Dachner, & Loopstra, 2014). The most recent available data shows that 12.6 percent of Canadian households had difficulty obtaining enough food for themselves and their families because of financial constraints

(Tarasuk, Mitchell, & Dachner, 2016). According to data from the Canadian Community Health Survey, the prevalence of food insecurity in Ontario was 11.8% between 2011 and 2012 (Tarasuk, Fafard St. Germain, & Mitchell, 2019). Food insecurity has been associated with poor physical (Seligman, Laraia, & Kushel, 2010) and mental health outcomes (Tarasuk, Mitchell, McLaren, & McIntyre, 2013; Maynard et al., 2018), higher health care costs, inadequate nutrient consumption, and higher mortality with increasing severity of food insecurity (Tarasuk et al. 2019; Kirkpatrick et al., 2015; Gunderson, Tarasuk, Cheng, de Oliveira, & Kurdyak, 2018). Food secure women report higher prevalence of adverse mental health outcomes than food secure men, whereas food insecure men and women are equally likely to report adverse mental health outcomes, suggesting that food insecurity narrows that difference. (Jessiman-Perrault & McIntyre, 2019). More severe food insecurity is related to higher likelihood of poor health outcomes and, unsurprisingly, people who are the most food insecure use more than double the health care dollars than people who are food secure (Tarasuk, 2019). The primary predictor of food insecurity is income level; however, after controlling for income, other factors increase the likelihood of being food insecure, such as being a single parent with children, being First Nations, renting versus owning one's home, and relying on social assistance (Tarasuk et al., 2019). It has been hypothesized that environmental level factors can also influence the ability to obtain enough food. Nonetheless, in Canada, contextual factors that influence food insecurity, such as place of residence, social capital, and availability of social services in a community, remain understudied (Tarasuk et al., 2019; Sriram & Tarasuk, 2016). Studying contextual factors is an important step in understanding the determinants of household food insecurity and gives direction to intervention efforts aimed at alleviating food insecurity and related vulnerabilities.

### **Responses to Food Insecurity in Canada**

Despite policies that exist to reduce poverty, food insecurity remains a serious issue in Canada. Until 2019, when ‘A Food Policy for Canada’ was introduced in the federal budget, there was no federal policy addressing food insecurity in Canada. As a response to lack of national and provincial level food security policy, community food programs have been a primary response to addressing food insecurity. These include both charitable and alternative food programs.

Charitable food programs, such as food banks and soup kitchens, were initially developed as short-term solutions to hunger (Roncarolo, Adam, Bisset, & Potvin, 2015). Although widespread in Canada, research suggests that these programs have limited capacity to address food insecurity and may reduce government’s motivation for social programs to address hunger as they may give the impression that food insecurity is being adequately addressed (McIntyre, 2016). Critiques of food banks are that they are inaccessible, the food is often of limited nutritious quality and variety, are associated with stigma and shame, that they do not address the root cause of food insecurity, and that they are more inefficient than cash or food stamps at distributing food (McIntyre, 2016). Often, they are a secondary service within an agency and need to fit within the structure and resources of that organization, rather than fit with the needs of program users.

As a response to the limitations of charitable models, many alternative food programs have been developed to address food insecurity and related issues. Examples include community kitchens, community gardens, food buying clubs, farmers markets, and food boxes. Although many of these initiatives identify as food security programs, research suggests that they have limited capacity to impact food security status or increase food resources (Loopstra, 2018). This

may be because these programs do not change the basic income of intended users (Loopstra & Tarasuk, 2013). In addition to goals of addressing hunger and food insecurity, these programs often have social aims, and have been found to improve budgeting and cooking skills, increase social support, and awareness (Roncarolo, Adam, Bisset & Potvin, 2015). While these may be important benefits, other research has found no difference in food preparation and cooking skills between food secure and food insecure people, thus this may not be a priority area for intervention (Huisken, Orr, & Tarasuk, 2016).

Many of these programs have low participation rates, suggesting a possible gap between the needs of intended users and what these programs provide (Kirkpatrick & Tarasuk, 2009). One issue that likely contributes to low uptake is that program developers and program users may have different perspectives on effective programming. A study examining perceptions of community programming and the perceptions of stakeholders and households in Québec found that program developers and program participants did not identify the same program factors as most helpful and had different perceptions regarding satisfaction with programming, with participants placing much more importance on food quality, variety, and food that matched their preferences (Hamelin, Mercier, & Bédard, 2008).

In addition to discrepancy between participant and stakeholder perspectives, there may also be differences in needs of urban and rural people for whom community food programming is intended. Research suggests that rural populations have needs and assets that are unique from those of their urban counterparts; these may increase their vulnerability to food insecurity. Rural dwellers live further from food retailers, may incur higher transportation costs that impact their food budget, and the food retailed in their communities may be more expensive than in urban areas (Williams, 2004; Buck-McFadyen 2015). It is important to investigate perspectives of rural

residents, examine contextual factors that could influence food programming in rural areas and to learn how to address barriers faced by rural dwellers.

Due to these factors, it is important to investigate how these programs are perceived by intended users and program developers, the benefits of them, the unique needs, strengths, and vulnerabilities of intended users, and the contextual factors that could influence program outcomes. This information can be used to design programs that are responsive to the communities in which they are implemented, allocate resources effectively, and contribute to understanding the underlying motivations of participants who use or do not use such programs. It is important to clarify what these programs accomplish since there are misconceptions about their contribution to issues such as food security (Tarasuk, 2001).

### **The Present Study**

Mobile food markets are an emerging response to limited access to fruit and vegetables, which is more common in lower income neighbourhoods (Gans, 2019). These programs transport food to communities which have limited access to food, due to geographic or financial challenges. They have been implemented in some cities in Canada and the United States and research examining their benefits is limited (Hsaio, 2018). Preliminary evidence suggests that they may increase fruit and vegetable intake, but most existing studies are limited by design (e.g. lack of control groups and small sample sizes) (Leone et al., 2018); however, the evidence base supporting mobile produce markets is increasing. Two recent cluster randomized controlled trials conducted in the United States found support for this type of intervention on improving diet; significantly increased fruit and vegetable intake was found among intervention participants in low-income communities compared to controls, and higher frequency of market use was associated with increased consumption (Gans et al., 2018; Leone et al., 2018). This is consistent

with previous studies employing pre-post cross-sectional designs demonstrating increased daily fruit and vegetable intake among market users, following the implementation of weekly fruit and vegetable markets in participating low-income communities (Freedman, Choi, Hurley, Anadu & Hebert, 2013; Evans et al., 2012; Abusabha, Namjoshi, & Klein, 2011).

Mobile produce markets often include multiple components, such as nutrition education, skill building, and recipe information and taste testing. Nutrition education, but not other educational components, has been associated with increased fruit and vegetable intake (Gans et al., 2018). Market use has also been associated with increased self-efficacy in incorporating produce into intervention participants' diets and their families' diets (Leone et al., 2018).

Most studies of mobile produce markets have been conducted in urban areas in the United States; a recent search did not identify any peer reviewed studies of such interventions in Canada. Additionally, investigation into their role in rural areas has been neglected. Some research suggests that rural residents engage in practices such as agriculture, hunting, home gardening, and food exchange suggesting that they may have ways of addressing food access and availability that are different than urban residents (Tomayko et al., 2017; De Marco, Thornburn, & Kue, 2009). Their food related needs may be addressed in ways that are different than in an urban context, pointing to the importance of including rural residents in research on food security interventions. Mobile produce markets are a promising strategy for improving fruit and vegetable consumption in communities, but further research is needed to better understand the impacts of such interventions on participants and outcomes related to food insecurity and health (Gans et al., 2018)

The present study investigates perceived outcomes of a mobile food market developed to address food insecurity and related issues in Ottawa, Ontario. We applied a socio-ecological

model (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008) to investigate whether and how this program was perceived to influence food behaviours at multiple environmental levels. This model is useful because it acknowledges the multiple environments that influence people's health and recognizes the dynamic relationships between factors that shape food and nutrition behaviours (Story et al., 2008). This study investigates perceived outcomes from the point of view of program users as well as from program developers in both urban and rural environments. A unique contribution of this present study is the examination of perceived outcomes of a mobile food market in both urban and rural environments.

### **The Program: The MarketMobile**

The MarketMobile is a novel community food program in Ottawa, Ontario, which was developed by the Poverty and Hunger Working Group (PHWG), an initiative of the Coalition for Community Health and Resource Centres. The PHWG was run out of the Rideau-Rockcliffe Community Health and Resource Centre in the city of Ottawa. The purpose of the MarketMobile is to bring affordable fruits and vegetables to four communities (three urban and one rural) in Ottawa that have limited access to food, because of geographic or financial barriers. A unique aspect of the MarketMobile program is that it was developed for, and delivered in, both urban and rural contexts, while most community food programs in Canada are provided in urban centres. Additionally, Loblaws Inc., a large Canadian supermarket company, partnered with the program and provided food at cost plus five percent.

The purpose of this study was to learn whether a novel community food security intervention, the MarketMobile, leads to perceived benefits for participants and their communities. The objectives of this study were to describe the perceived outcomes of the

MarketMobile from the perspectives of both stakeholders and participants in urban and rural communities in Ottawa, Ontario. The research questions were:

1. What were the perceived outcomes of the MarketMobile at the ecological levels included in Story et al.'s (2008) model? For example, at the individual level, did the program contribute to: a more varied, healthier diet? Increased consumption of fruits and vegetables? Lower stress around food acquisition? Did the program lead to perceived changes in participants' social environments? Did the program lead to changes in the physical environment?
2. What was the contribution of the MarketMobile to both individuals and communities, according to participants and stakeholders?
3. How was the MarketMobile perceived across urban and rural settings by both participants and stakeholders?
4. Were there adverse or unintended consequences of the program?

This study describes the perceived outcomes of the MarketMobile on communities and individuals from both a stakeholder and participant perspective across urban and rural communities. Although there is considerable research investigating food insecurity, its prevalence, and consequences, less is known about the direct experience of people who have limited access to food and who access alternative food programs designed to address food insecurity (McIntyre, Williams, & Glanville, 2007; Power, 2005; Runnels, Kristjansson, & Calhoun, 2011; Williams, MacAulay, et al., 2012; Knezevic, Hunter, Watt, Williams, & Anderson, 2014). Gaps remain regarding the ways in which aspects of these programs could influence the ability to access healthy and affordable food and influence other determinants of health, such as emotional states, perceptions of personal health, and social interaction (Loopstra

& Tarasuk, 2013; Popkin, Duffey, & Gordon-Larsen, 2005; Runnels, Kristjansson, & Calhoun, 2011). This project addresses such gaps.

## **Method**

### **Participants and Setting**

Study participants included MarketMobile stakeholders and customers. The steering committee was responsible for the planning, delivery, and oversight of the program in each of the four communities. Membership was diverse, comprising representatives from various community health and resource centres, community organizations, and Loblaws. The community developers were responsible for overseeing program delivery in their community. MarketMobile participants were people who attended the MarketMobile on one of the first two delivery days, when recruitment occurred. Thirty-six program users and ten stakeholders completed initial interviews about their experiences. At follow-up, twenty program users and five stakeholders completed interviews. MarketMobile program users were eligible for the study if they were over eighteen years old and spoke English or French and had attended the MarketMobile at least once. Stakeholders were eligible to participate if they were on the steering committee or were a community developer responsible for overseeing the project in one of the participating communities.

The study took place in Ontario, Canada. Four communities in the National Capital Region, three urban and one rural, received the MarketMobile pilot project. Communities learned about the project through communications from the Poverty and Hunger Working Group who distributed information about the MarketMobile to community health and resource centres in Ottawa. Communities interested in participating applied to the Poverty and Hunger Working Group and had to demonstrate need, interest, and capacity to the steering committee. The criteria

were defined in consultation with Ottawa Public Health and the Ottawa Neighbourhood Study, an interdisciplinary population health study out of the University of Ottawa that works to define neighbourhoods in Ottawa and measure social determinants of health (Ottawa Neighbourhood Study, 2019). Need was determined by being in the fourth or fifth lowest socioeconomic income quintile with a distance of one or more kilometers to the nearest grocery store for urban communities. Socio-economic quintiles are based on different estimates of socio-economic status, such as education level, occupational characteristics, income, living conditions, and immigration which gives an index of relative neighbourhood advantage (Parenteau, et al., 2008). The rural communities demonstrated need by having a population weighted centroid being greater than sixteen kilometers away from the nearest grocery store, but they did not have the financial need requirement. Interest and capacity were determined by whether there were community leads who could regularly attend program planning meetings whether the community had a base of volunteers to facilitate the program's delivery in the community. The selected urban communities were Morrison Gardens, Carlington, Hunt Club. The rural community included in the project was Vars. Morrison Gardens is in the fifth socioeconomic quintile with a centre 2308 metres to the nearest grocery store. Carlington falls into the fifth socioeconomic quintile and its centre is 1488 metres from the nearest grocery store. Hunt Club is in the fourth socioeconomic quintile with a centre 2780 metres from the nearest grocery store. Vars, a more affluent community has a centre 18480 metres from the nearest grocery store.

### **Recruitment**

Steering committee members were contacted via email (see Appendix I and J) and asked to participate in interviews about their experiences on the committee and planning the MarketMobile intervention. The primary investigator conducted interviews with each

stakeholder at the University of Ottawa, community and health resource centres, or by telephone, depending on the preference of the interviewee.

MarketMobile customers were recruited using convenience sampling for interviews from each of the four sites during the first two weeks of program delivery. They were approached by either the primary investigator or a research assistant on site and asked if they would like to complete a survey and/or participate in an interview about their experience with the MarketMobile. If they agreed, they completed the survey on site and provided their contact information to arrange an interview. They were not required to complete the survey to be eligible to participate in an interview. Survey data is reported in the first paper of this dissertation. Participants were contacted by the primary investigator by telephone and email and interviews were scheduled and conducted at the participants' convenience. Participants were compensated with vouchers for the MarketMobile and for their travel.

## **Materials**

**Semi-structured interviews.** Four semi-structured interviews were developed based on the study's objectives and in consultation with the MarketMobile steering committee and research team. The interview questions captured the environmental levels included Story et al.'s (2008) model and concerned whether and how the program led to perceived changes at the individual, social environmental, physical environmental, or macro-environmental level contexts.

Two interview protocols were developed for the MarketMobile participants. The first protocol (see Appendix G) given at the beginning of the study included twelve interview questions focused on perceived food access in their communities, community belonging, and impressions of the MarketMobile and its potential for impacting food access in participants' communities. The second interview protocol (see Appendix H) given at the end of the study

focused on whether the participants observed changes over time and their perceptions of how the MarketMobile impacted them and their communities. Items assessing food availability in the home included in the interview protocols were not completed because program organizers thought that it would be too time consuming for participants to complete and was not needed to inform the MarketMobile evaluation.

Two interview protocols were developed for the MarketMobile stakeholders, one given at the study's onset and the other given near the end of the study. Questions from the first interview (see Appendix L) focused on planning the program, anticipated outcomes, and their involvement on the steering committee. Questions from the second interview protocol (see Appendix M) focused on perceived program impacts, sustainability, organizational factors, and their experience working on the project. Demographic information was not collected from the stakeholders.

**Socio-demographic questionnaire.** A brief socio-demographic questionnaire, included in the participants' first interview protocol, was developed to gather information about the participants. These questions assessed age, sex, place of birth, neighbourhood and length of time residing in their current neighbourhood, number of people in their household, education level, and household income bracket from all sources over the past twelve months. An item assessing whether their income was sufficient to meet their needs and was rated on a five-point Likert scale from 'always' to 'never.'

### **Procedure**

Ethics approval was granted by the University of Ottawa Research and Ethics Board. Each month for one year, the primary investigator attended MarketMobile development meetings to learn about the project, familiarize herself with the stakeholders and communities, and

collaboratively develop survey and interview materials with the MarketMobile team, considering both individual and ecological factors. Surveys and interviews were developed to capture relevant information for the program developers for program feedback and improvement and for the purposes of this project. Developing materials collaboratively was important because the team had intimate knowledge of the communities in which they worked, and some had personal experience with food insecurity and poverty. This, in combination with input from the thesis supervisor, committee, and literature review, informed development of materials that were relevant for the project and sensitive to the interviewees.

The primary investigator conducted interviews with both MarketMobile customers and MarketMobile stakeholders. Interviews occurred at two time points over the course of the MarketMobile pilot. The initial round of interviews occurred within the first month of program delivery and the final round occurred after the completion of the pilot. Interviews were scheduled at a time that was convenient for the interviewee. Stakeholders and program participants reported their expectations of the program, perceived benefits of the program, and their perceptions of community need for such programming. Stakeholder interviews were conducted at several locations, including the Rideau-Rockcliffe Community Health and Resource Centre, as this was a frequent meeting place for steering committee members, and the University of Ottawa, depending on interviewee preference. Interviews with program participants were conducted at the University of Ottawa or at public locations in the participants' community, such as at coffee shops, parks, and shopping malls. Selecting accessible locations was important to accommodate participants with limited resources. Consent was obtained and interviews were audio recorded. Following each interview, participants completed a short socio-demographic questionnaire.

### **Analysis**

Descriptive statistics were used to describe the socio-demographic characteristics of the participants. Please see Table 1 for a description of participants' demographics.

A general inductive approach was used for qualitative analysis. In this approach, analysis is guided by the research and evaluation objectives (Thomas, 2006). The steps outlined by Thomas (2006) were followed to analyze the data. Analysis and interpretation were guided by the research and evaluation questions. Text that related to food insecurity and to Story et al.'s (2008) socio-ecological model of food and eating behaviours was also coded. After the interviews were transcribed and prepared for analysis, the primary investigator and a fellow graduate student with experience in food access research and qualitative analysis reviewed a subset of the transcripts. Detailed reading of the text was done to familiarize the researchers with the content and themes in the interviews and categories were created to capture meaningful text. The remaining transcripts were divided between the primary investigator and the other graduate student for coding. Discussions between the two coders happened regularly to reduce overlap among categories, address and resolve disagreements, and to develop and revise the coding scheme and codebook (Barbour, 2001). To understand participants and stakeholder experiences with the program between the beginning of the pilot and the end of the pilot, we compared baseline interviews with follow-up interviews using the established categories and reflecting on two questions recommended by Holland (2007) and Saldana (2002). The first was whether anything had changed over the course of the pilot according to stakeholders and participants, and the second was what contextual conditions may have accounted for change or lack thereof. Efforts were taken to promote trustworthiness of the analysis, such as the regular meetings between the coders which provided the opportunity for peer debriefing to reflect on biases with a knowledgeable peer who did not have a stake in the project. Summaries of baseline interviews

were provided to the interviewees at follow-up and discussed with participants as a way to enhance trustworthiness of the data (Calman, Brunton, & Molassiotis, 2015). Feedback was elicited from participants about the interpretations and participants were invited to contact the researcher should they have wanted to provide additional feedback.

## Results

### Participant Characteristics

Thirty-six participants completed initial interviews and twenty completed follow-up interviews, which occurred after the pilot period of the MarketMobile. Participants' ages ranged from 27 years old to 70 years old. Most participants were women (77.7%), while 22.2% were men.

*Table 1. Demographic characteristics of participants (MarketMobile users)*

Variable	Overall	
	N	%
Sex		
Male	8	22.2
Female	28	77.7
Born in Canada		
Yes	29	80.5
No	7	19.4
Number of people in household		
1-5	32	88.8
6+	4	11.1
Income sufficient		
Always	7	19.4
Mostly	12	33.3
Sometimes	9	25
Rarely and/or Never	8	22.2

### Perceived Program Outcomes

The findings are discussed in terms of the key themes identified in the analysis. The perspectives of urban and rural program users, as well as stakeholders, are described.

Occasionally, only follow-up findings are described within a theme because the topic was not

discussed by participants at baseline. The discussion section will link the findings to the ecological levels described by Story et al. (2008).

*Table 2. Summary of themes*

<b>Themes</b>	<b>Sub-themes</b>
1. Perceived individual level outcomes	<ul style="list-style-type: none"> <li>a) Financial</li> <li>b) Physical health</li> <li>c) Psychological well-being</li> <li>d) Knowledge of other programs and resources</li> <li>e) Family involvement</li> <li>f) Socializing</li> </ul>
2. Experiences with other food programs	<ul style="list-style-type: none"> <li>a) Comparison to the MarketMobile</li> <li>b) Influence on uptake</li> </ul>
3. Perceived community level outcomes	<ul style="list-style-type: none"> <li>a) Sense of community belonging</li> <li>b) Community capacity</li> <li>c) Perceptions of community</li> </ul>
4. Program developer experiences	<ul style="list-style-type: none"> <li>a) Professional development</li> <li>b) Involvement in research</li> </ul>
5. Lack of outcome	

### **Perceived Individual Level Outcomes**

**Financial impacts.** At baseline, across urban and rural sites, most participants reported that shopping at the MarketMobile had financial benefits. Participants who described their current shopping practices referenced strategies they used to maximize their food budget such as budgeting, using coupons, and planning ahead and perceived themselves to be skilled in these areas. Such participants reported that, because of the MarketMobile, they were able to buy a larger quantity of produce, that the money saved contributed to more flexibility with their budget and that they were able to buy foods that they identified as more expensive and difficult to access, such as meat. These benefits were reiterated at follow-up, particularly for urban participants. At follow-up, a few participants reported that they become more aware of the difference between wholesale versus on the shelf pricing and that this influenced their regular

grocery shopping. A couple of participants reported dissatisfaction on occasion when they noticed that the prices at the MarketMobile were higher than at the grocery store.

Some participants were on fixed incomes and receiving pensions or social assistance. These participants reported being able to buy other important household items and do activities with their children because they were saving money at the MarketMobile. Many participants believed that the MarketMobile would benefit others, particularly people who they described as being more “in need” than themselves. Some participants reported being unsure of how much they should purchase and whether it was “right” for them to use the MarketMobile as they considered others to be more financially “in need,” despite also reporting difficulty obtaining adequate food due to financial limitations.

Some stakeholders reported that, despite the low cost of food available for purchase on the MarketMobile, finances could still be a barrier to participation for people living in poverty. At follow-up, stakeholders described navigating the tension between maintaining the program mandate of providing affordable food while also requiring resources to continue the program.

At baseline, some rural participants reported that they were surprised that the program was in their community as they believed it to be for people of low income. One stakeholder reported that a benefit of the discounted produce at the MarketMobile was not only the financial savings but, by extension, that it allowed more equal opportunity for food.

“I’m looking as a family dynamic kind of thing here where you have a mom who can now send her kids off to school with an apple in their lunchbox or whatever, so you have kids who are not being differentiated, oh, he’s the one who always has the bologna sandwich on the white bread with no mayonnaise.” (Stakeholder).

At follow-up, most rural participants reported that they appreciated the prices of the food but, in contrast to the urban participants, discussed this in terms of perceived benefit for other people and not themselves. Rural participants generally reported that the low prices were helpful but that they did not “need” the prices to be low to buy the type, quantity, and quality of the produce they wanted.

“I think it's great for the older people, older than me anyhow. Because I didn't see that many young people there yesterday. Now I'm going to go back again because I've got a little bit of social aspect myself, I want to see who attends these things. For people who are on a fixed income, I noticed a lot of people there were on fixed incomes, that's not necessarily pensions, defined pensions. These people have to make their pennies count. I think that's an excellent way to do it.” (Rural participant).

**Physical health.** Both urban and rural participants reported that the MarketMobile influenced their physical health in terms of diet and physical activity.

**Diet.** At baseline, Participants anticipated that the MarketMobile would help improve their diets. Some reported that the MarketMobile could have benefits on dietary choices made outside of the MarketMobile by familiarizing people with fruits and vegetables so that they buy such foods at the grocery store in the future.

At follow-up, participants overwhelmingly reported that they increased the quantity and variety of fruits and vegetables they purchased. Through using the MarketMobile, many customers reported being more likely to buy produce they had not tried before or were unfamiliar with, because a volunteer or staff member could explain to them what it was and how to prepare it, or they were able to try it at one of the food demonstrations available on site. These participants compared this to the grocery store, where they believed they would be less likely to

receive this information from employees. Other participants reported that they ate less “junk” food and more fruit because it was present in their communities.

“Yeah, because before like if I go to the store and I'm hungry I'm going to take some chips and some stupid stuff, and I didn't care about food and vegetable because for me it was too expensive, but with the Market Mobile I had access to it. The fruit is there and the vegetable is there. If I'm hungry I can take an apple or I can do a fruit salad, I can do a salad, but before I didn't have access to all that” (Urban participant).

Although many participants reported that the program had dietary benefits at follow-up, others reported few changes. This was found mostly in the rural community. Some participants reported no perceived impact on diet at follow-up, noting they already ate diets rich in fruits and vegetables and that if the MarketMobile was not available, they would buy produce at the grocery store. Some rural participants also discussed using rural roadside fruit and vegetables stands or growing their own produce in a home garden. One urban participant noted “I'm still buying the same things; it was just easier and cheaper.” Some participants reported that they would still eat fruits and vegetables but might have less variety or “special” and “fun” items, such as berries. These participants reported that they thought that the program would be beneficial for other people's diets.

At follow-up, the program was perceived to have little dietary benefit for participants who reported skipping meals, reducing their food intake, or eating a restricted diet because of limited financial resources. While they reported that the MarketMobile was helpful, they noted that the program could not adequately address these challenges because it did not increase their financial means, was only in the community twice per month, and they needed other food groups to prepare full meals.

***Physical activity.*** At baseline, several customers, mainly in the rural community, reported that the MarketMobile contributed to their physical activity as it was within walking distance of their homes. A few urban customers reported that a benefit of the MarketMobile's location was that they could walk or cycle to it.

***Psychological well-being.*** Many participants and some stakeholders discussed the MarketMobile's contribution to participants' mental and emotional well-being. At baseline, most urban participants reported worrying about food shopping.

***Stress.*** At baseline, many participants reported that acquiring food was a stressful experience, due to factors such as insufficient finances, transportation challenges, lack of time, and caretaking for young children. At follow-up, many participants reported that the MarketMobile alleviated worry related to food acquisition because of the prices and the location, which was described as convenient. They also reported that it eased the experience of shopping with young children as there were often activities for children offered on site.

***Accomplishment.*** Although not mentioned at baseline, at follow-up, some participants reported a sense of accomplishment that was fostered through shopping at the MarketMobile. For example, some people reported that they felt like they were "good parents" because they were able to provide healthy food for their children. Some reported a feeling of pride in being able to make their dollar go further and manage their budget. Others reported that it was important to them to purchase their own food, rather than receiving it for free.

Many participants reported that the MarketMobile was evidence that people in community leadership roles do care about people of lower income and want to contribute to the community. Some participants reported a belief that their communities do "nothing for them" and do not offer services or activities that meet their needs. In their opinions, the MarketMobile

was an example of the community responding to their needs. They reported that this helped them feel supported by their community which, in turn, eased feelings of stress.

**Knowledge of community programs.** At baseline, all community developers and steering committee members reported that increasing participants' knowledge of other community programs, resources, and services was a goal of the MarketMobile program and that this would be accomplished through the presence of such programs and information about them during delivery dates. However, at follow-up, most participants reported no changes in their awareness of such programs. Some reported that such information would be helpful. Others reported that they attended the MarketMobile to purchase food and did not pay attention to other activities going on. A few participants noted that they learned that their community had health services (e.g. a nurse), learned about smoking cessation, and learned about other vendors available. Nutrition education was frequently discussed by participants. Most participants reported beliefs that people, particularly people with children, would benefit from this information.

**Family involvement.** Although not mentioned at baseline, at follow-up, some participants reported that the MarketMobile had benefits for their families. Customers reported that they often brought their children to the MarketMobile to involve them in selecting fruits and vegetables so that they would want to eat more healthy food. Financially, participants noted that their families benefitted because their budget could stretch further, and they could buy "fun food" items (e.g. fruits) for their children that are typically more expensive at the grocery store. In one urban community, several participants mentioned that the location of the MarketMobile helped them keep themselves and their children safe. These participants noted that they typically must cross a busy intersection to access the nearest grocery store, which was difficult to do when going shopping with young children.

**Socializing.** At baseline, beliefs were mixed about the MarketMobile’s ability to promote social benefits. At follow-up, many customers reported that the MarketMobile provided an opportunity to socialize with other community members. They reported that the program staff and volunteers facilitated a safe, friendly, and fun atmosphere that encouraged socializing. Examples of social benefits included talking to people while waiting in line, becoming more familiar with people using the program throughout the pilot and being more likely to speak with them outside of the program.

Some customers reported that they did not think that the MarketMobile had social benefits for them. They attributed this to intrapersonal factors, such as not being “social people.” They also reported that they already knew the people in their community and so the MarketMobile did not contribute to this.

### **Experiences with Other Food Programs**

**Comparison to the MarketMobile.** At baseline and follow-up, many participants compared their MarketMobile experience to using other food programs, such as the food bank and alternative food programs, like the Ottawa Good Food Markets, and farmer’s markets, and the grocery store. They talked about how using such programming makes them feel about themselves and their abilities, and the importance of making choices for themselves. Overall, participants reported that they felt good about themselves at the MarketMobile because they were purchasing their own food and were able to make choices about the food they wanted, which they noted was not always possible at the food bank or in alternative food programming. No rural participants discussed personal experiences with food banks.

Some participants compared their experience at the MarketMobile with their experiences at the food bank. As noted above, many reported that they enjoyed socializing at the

MarketMobile, both with their fellow neighbours and with program staff and volunteers. Some participants who also use the food bank noted that they did not want to socialize with others at the food bank and that they disliked the “atmosphere.” One participant noted that there was no difference and that he would get to know people standing in line at the food bank and at the MarketMobile.

**Influence on uptake.** Stakeholders also discussed the differences between the MarketMobile and charitable models of food provision and how this could impact use of the MarketMobile. Willingness to take charity, less ability to choose the foods, filling out forms to qualify for the service, and quality of food were identified as challenges of using food banks. Stakeholders reported that such challenges could promote or hinder use of the MarketMobile. Some participants and stakeholders reported that experiences with other food programming could deter people from using the MarketMobile. For example, they noted that people who used other food programming and were not satisfied with the quality may not have used the MarketMobile, expecting it to be similar.

### **Perceived Community Level Outcomes**

**Sense of community belonging.** At baseline, many customers described what community belonging meant to them, as one of the objectives or projected goals of the MarketMobile was to influence sense of community belonging. Knowing other community members, having things in common with other people, involvement in events and activities, helping and being helped, feeling safe were included in most customers’ descriptions of community belonging. These factors were reported by both urban and rural participants. Most participants described their sense of community belonging as either Very Strong (33.3%) or Somewhat Strong (44.4%). At baseline, some customers were doubtful that the MarketMobile would influence sense of

community belonging as they thought the customer base was not limited to any one community in the sites where it was implemented. People from any community could use the MarketMobile. A few customers noted that the people who used the MarketMobile already participate in other community events and that they already knew everyone. At follow-up, some customers reported that the MarketMobile positively influenced their sense of community belonging, because it gave people in the community something in common. Other customers noted that the help offered at the MarketMobile, by staff, volunteers, and community members contributed to a sense of community. This fit with descriptions of community belonging provided by many participants, which included offering help to others in a reciprocal way. Even when these customers reported that they did not make friends through the MarketMobile, they reported that participating fostered a sense that they were part of a community and could rely on others for help.

**Perceptions of community.** At baseline and follow-up, many participants reported that the MarketMobile program was changing perceptions of their communities, both within the community and outside the community. A few participants thought that the MarketMobile would have no impact on the community. Reasons for this were that the program was too brief and its presence in their communities was too time limited to result in change.

At baseline, in the urban context, participants often noted that their communities were viewed negatively because they are low income. They talked about negative stereotypes associated with the communities where they live and that the MarketMobile showed that they were doing something positive for their community. At baseline, the MarketMobile was viewed as a means of changing people's perceptions of the community, both by attracting people into the community to use the program and through press and media reporting on the program. At follow-

up, participants reported their belief that the program was positively influencing how others viewed their community and that this was beneficial for community members.

“The bus benefits us, too, in the neighborhood. Not just for items, but it brings people into the neighborhood, when most people would walk by it because it's low income. People are coming in, and they're meeting us, and they're seeing us, and they're realizing we're not drunks or drug addicts. Do you know what I mean? We're people raising our kids, just like everybody else in this world. We're not these statistics everybody keeps talking about. You're not a stereotype.” (Urban participant).

The press coverage of the MarketMobile was extensive, particularly early in program delivery when the program launched. At baseline, some participants in the urban sites reported that the MarketMobile brought negative press to their communities. They described an experience early in the pilot where there was an online news story about the MarketMobile and many of the comments were negative. They also talked about how their community had received negative comments online in news articles reporting on the MarketMobile, and how this reinforced stereotypes about living in low-income areas, as well as myths about the MarketMobile (e.g. that people were receiving food “for free”). Many participants reported that it was important to them to be included in discussions of how the program was presented in the media.

At baseline, in the rural context, participants anticipated that the MarketMobile program could influence how their community is perceived by those living outside the community. Overall, rural participants reported that the MarketMobile would positively impact how their community is perceived and that it would show others what is going on in the community and “put [them] on the map.” Additionally, some rural participants reported that the program could

change the perception that this community is a “bedroom community.” At follow-up, many rural participants reported that the MarketMobile demonstrated that the City of Ottawa valued their community. Some participants noted that it was important that a large grocery store chain was “doing their part” and “reaching out” to a rural community. One noted that the program demonstrated that there is “something going on” in their community.

At follow-up, program developers and steering committee members discussed the importance of being careful in handling this attention to the communities. They noted that the MarketMobile could “raise the profile” of such neighbourhoods in a positive way but also identify community members as having lower income and using social services, and that this could be viewed negatively both within the communities and from outside.

**Community capacity.** This was described by stakeholders as continued community engagement in programming and skill building in volunteers and in the communities to support further programming. At baseline, most stakeholders and some customers, in both urban and rural contexts, reported that the MarketMobile could serve as a catalyst for other programming, services, and events in their communities. For example, in the rural setting, participants reported that use of the MarketMobile could demonstrate a need for a permanent grocery store or farmers market. At follow up, when describing whether the MarketMobile contributed to participant involvement and engagement in their communities, some urban participants reported that their community began implementing a lunch program and using fruits and vegetables from the MarketMobile in this program, which was described as development in their community to address food related needs. These participants reported that the MarketMobile drew attention to food needs within their communities and served as an example of how they could contribute to their communities. One participant who lived in a non-participating community but used the

MarketMobile noted that they started working with their community health and resource centre on an application to have the MarketMobile in their community.

In terms of developing skills in volunteers as a component of building community capacity, stakeholders reported that it was difficult to secure a consistent volunteer base and so they were uncertain of the impact the program would have had on developing skills (e.g. customer service skills, money handling skills) in volunteers. Participants who also volunteered for the program generally reported benefits to their psychological wellbeing, rather than skill related impacts. For example, they reported that it felt good to contribute and that volunteering helped them feel like they were making a difference. Stakeholders reported that two participating communities used their experience with the MarketMobile to apply for grants to support healthy food provision in their communities.

### **Program Developer Experiences**

**Professional development.** Although not mentioned at baseline, at follow-up, several stakeholders reported that they were impacted through their involvement with the MarketMobile. They noted that it provided them with the opportunity to network and meet others in the field, which contributed positively to professional development. Other stakeholders reported that they were challenged by working on this project and that it was “stressful” working with limited time and financial resources. Although they reported that this project was rewarding, they noted that they often worked overtime, unpaid, and that they had difficulty balancing the demands of the project with other work duties.

**Involvement in research.** At follow-up, some stakeholders noted that participating in the research and evaluation project encouraged them to think “more critically” about the program, its

purpose, and mechanisms of change; they believed that this positively impacted the quality of their work.

### **Lack of Outcome at Individual and Community Levels**

At baseline, while most participants across settings reported belief that the MarketMobile would have impacts, some expressed doubt. Frequency of delivery, limited product, lack of interest, lack of money, cold weather, lack of awareness of the program were reasons why participants thought the program would not have impacts. The perceived novelty and impermanence of the program was also thought to potentially interfere with outcomes.

“They are not giving us sufficient food. We have to go to another store, so I will not say that it has a great impact on food of my family...but these types of experimental projects do not bring anything, for the family.” (Urban participant, follow-up).

Regardless of reported barriers to outcomes, at follow-up, all participants reported that they wanted the MarketMobile to continue coming to their communities.

Some program developers also discussed perceived reasons for lack of impact. Several stakeholders described the program as “circumscribed” as it was delivered in only four neighbourhoods in Ottawa and acknowledged that hunger and food insecurity affect many more people in the Ottawa area than would be reached by the MarketMobile. They reported that it was important to frame the program as a contribution to broader food insecurity initiatives but not as a solution in and of itself. One program developer noted that they did not think that the program reached “as deeply” as it could have into the neighbourhoods and thought that people may not have used the program because they did not understand its purpose or who it was for.

### Discussion

The present study investigated the perceived impacts of a community food program called the MarketMobile. An important contribution of this research was exploring the perceived impacts of the program in both urban and rural settings. Another central feature of this study was evaluating perceptions of the program from both participants and stakeholders. Considering the views of multiple perspectives in various settings provides a more thorough depiction of the impacts of the program.

The findings from the study suggest that the MarketMobile led to some perceived benefits for participants and stakeholders. The following discussion will explicitly link the findings to Story et al.'s (2008) social-ecological model that was used to guide the research. Results also demonstrated that urban and rural participants viewed the contribution of the MarketMobile to their communities differently, and this finding will be discussed in terms of economic differences between the communities. The findings suggest that there were perceived negative outcomes related to the MarketMobile, acknowledged by both stakeholders and participants.

#### **Finding I: The MarketMobile, Physical and Mental Health, and Financial Outcomes at the Individual Level**

Participants reported that the program had important behavioural, financial, and psychological benefits at the individual level. Although this study did not directly assess diet, participants generally reported that the program improved the variety, quantity, and quality of produce in their diet and helped them financially. Further, some of these participants were able to stretch their dollars and purchase other more expensive foods (e.g. meat) more frequently with the money they saved by using the MarketMobile and reported buying less “junk” foods because

they were better able to purchase more fruit and vegetables. This is consistent with research showing self-reported produce intake increases among regular users of mobile produce markets compared to non-users (Leone, Haynes-Maslow, & Ammerman, 2018). People who did not report an improvement in diet reported that they already ate a diet rich in fruits and vegetables, which could be because they had the resources and behavioural capability to do so. Participants described the importance of eating fruits and vegetables for their health and reported using strategies to manage their food budgets, demonstrating understanding of the benefits of a healthy diet and skills in obtaining and preparing food. This is consistent with research showing that people who have difficulties accessing food have adequate knowledge about food preparation, budgeting, and healthy eating even though educational components are often included in food programs, as a means of improving diet related outcomes. Focusing on including educational and skills related components could perpetuate the idea that food insecurity and inadequate diet quality are problems with the individual knowledge deficits, and that if people had access to information, they would include more fruits and vegetables in their diet. Despite this, food and nutrition information were areas that some participants wanted to learn more about.

Both urban and rural participants benefitted from the program. Differences between urban and rural participants were that urban participants reported more financial benefits for themselves than rural participants, and this could be explained by the financial security of the rural participants. Site selection likely had implications for the perceived benefits were observed between urban and rural locations.

Generally, participants reported that the program did not influence their knowledge of community services and resources. As the program was advertised as a food program, people in need of service-related knowledge may not have attended or paid attention only to the food

service. There were participants who noted that they would have liked to have learned about other community services and resources. Food security programs, like the MarketMobile, could help address these knowledge gaps but may benefit from being more explicit about advertising program components that are not food related.

While previous research suggests that health problems can be a barrier to participation, there were participants in this research study who noted that attending the MarketMobile helped ease the burden of mental and physical health challenges. (Loopstra & Tarasuk, 2013). The MarketMobile addressed factors that are related to correlates of mental health difficulties, such as social isolation. The program provided opportunities for social interaction and participation in the community. It also reduced the economic burden of food, which participants perceived to reduce their stress as well as allowed them to purchase produce that contributed positively to their perceived diets, potentially influencing the sense of accomplishment and competence that participants described through providing healthy food for themselves and their families, referred to as self-efficacy in the model by Story et al. (2008). Given the increased risk of poor mental and physical health outcomes associated with food insecurity, programs such as the MarketMobile that include components such as lower priced food, promote social opportunities, and are convenient may ease the perceived experience of people at increased risk. Participants who noted that they do not experience stress or worry about accessing food, and that the program had no perceived impact on this, also reported having enough money and resources that allowed them to meet their needs in a flexible way. This emphasizes the necessity of adequate financial resources and that while the MarketMobile had positively perceived benefits for individuals, the primary constraint of poverty to food access remains.

Contextualizing the MarketMobile experience by comparing to obtaining food at the grocery store or food bank drew attention to the role of the program in influencing participants' perceived health. The MarketMobile was perceived to be a place where they could ask for help, make choices about the foods they wanted, socialize, and have healthier options, and to be less stigmatizing than using the food bank. This was important, as previous research has demonstrated that opportunities for socialization can increase uptake of mobile produce markets (Robinson, Weissman, Adair, Potteiger, & Villanueva, 2016). Although food bank use was described positively as a place to receive social support in an ethnographic account of rural women's lived experience with food insecurity (Buck-McFayden, 2015), participants in the present study generally described food bank use negatively and noted that they tried to avoid going. The grocery store was typically not viewed as a place where participants could ask for help and where they were more limited by their finances than at the MarketMobile. The potential drawbacks (e.g. stigmatizing, perception of lower quality food, limited variety of food) of receiving food from charitable organizations like food banks was also recognized by stakeholders. The MarketMobile included social and physical environmental factors that addressed these barriers, which may have been particularly important for people of lower income who had negative experiences with other models of food programs, such as food banks.

One important finding was the influence of the program on the staff and volunteers. Stakeholders generally described their experiences working on the MarketMobile project very positively and noted that it contributed to their professional development and provided educational opportunities for them. Given the demands of community programming, community food programming should incorporate strategies that draw on these positive experiences to attract and maintain stakeholder involvement.

There were drawbacks for staff and volunteers. These included reports of stress, working overtime, and less time to dedicate to other work-related projects. Organizational factors such as demanding schedules and lack of funding to support staff can influence use of mobile produce markets (Tripicchio et al., 2017)

It is important to consider the impact of these programs on the people who are responsible for running them because this could have implications for ongoing programming. Because these programs are demanding and are resource limited, and rely heavily on volunteerism, understanding the challenges of the work for stakeholders could point to ways of mitigating these difficulties and developing organizational strategies to maintain participation.

### **Finding II: The Role of the MarketMobile in the Social and Physical Environment**

The findings present support for the mechanisms by which social environments may influence people and their food behaviours, such as role modelling, social support, and social norms (Story et al., 2008). Many participants reported social benefits, in that they interacted with other community members on site and that the program gave the people in the community something in common. This is consistent with research on other community food programming, which has demonstrated increased social support and social skills among participants (Iacovou et al., 2013). Additionally, some participants reported that the program promoted meal sharing and shopping together as they participated in this “community event”, which was something they had not done prior to the MarketMobile. Finally, some participants who were parents reported that the MarketMobile was family friendly and offered benefits for their children, such as the ability to model healthy choices and promote participation in leisure activities that were affordable. These are important findings, given research on the lived experience of food insecurity, which documents social isolation, feelings of alienation, and the constraints of poverty, which limit

people's opportunities for social support and recreation (Runnels, Kristjansson, & Calhoun, 2011). Participants who did not perceive social benefits for themselves generally attributed this to intrapersonal characteristics (e.g. not being a "social person") or to timing and frequency of program delivery.

Participants and stakeholders viewed the program as a mechanism for showing the broader community their strengths and challenging negative or stereotypic assumptions about where they lived, thus influencing the broader social environment. Urban participants viewed the MarketMobile as a tool to demonstrate that their communities have many positive characteristics, are "just like everybody else" and should not be stereotyped or defined by their income status. This is consistent with research demonstrating that people who are marginalized do not want to be labeled "low-income" or have their communities labeled that way (Haynes-Maslow, Auvergne, Mark, Ammerman, & Weiner, 2015). Participants in the rural program perceived that it drew positive attention to the rural community as well. Additionally, some participants reported that the MarketMobile helped them feel that the community at large was "there for them" (urban participant) and was "doing their part" (rural participant). Mobile food markets should include efforts to foster this sense of social support, which could help encourage participation in the program.

The MarketMobile influenced the social environment through role modelling and social support by both participants and program staff and volunteers. Social networks have been found to promote engagement in farmers markets and are an area for future research to investigate how social networks influence use in alternative food programming, such as mobile food markets (Hsiao, 2019). Findings from this study suggest that the social support from staff and volunteers was an important reason why participants reported that they purchased new fruits and vegetables

to increase variety in their diets. Social support between participants, such as cooking together and meal sharing, was facilitated through the MarketMobile and may have influenced participants' diet. This meal sharing was a new behaviour for participants and future research should investigate the role of food programs such as mobile food markets in shaping norms around eating behaviours, as suggested in Story et al.'s (2008) model. Role modelling occurred on site through food demonstrations and recipe test tastings. Some participants reported that the family friendly environment allowed their children to participate in food shopping and that they could role model healthy food behaviours.

Negative influences on the social environment related to beliefs about how their community was perceived by outsiders and negative comments about their communities in media. Importantly, this was recognized by both participants and stakeholders. Communities that implement programs intended to improve access for populations of lower income should be aware that this can draw attention to the disadvantage in these communities, potentially having negative consequences for the people in those communities.

Interestingly, rural participants reported no perceived negative outcomes of having the program in their community. This may be because the rural participants and community were more economically advantaged than the urban communities and thus stereotypes about lower socio-economic status may not have come into play. Previous research has demonstrated that people who are food insecure and live in rural areas face unique disadvantages and barriers in accessing food, but these experiences were not represented in this study. This is an area for future research on the contribution of mobile food markets.

The MarketMobile may have encouraged development, beyond the program itself, to influence food access within the physical environment. Stakeholders and participants viewed the

program as a way to draw other food retailing to the community, rather than as a necessarily permanent program within the rural community. The MarketMobile's presence in the rural community provided an opportunity for a farmers' market to develop alongside of it, which influenced the physical food environment in the community. Although some research demonstrates that farmers' markets offer food at higher price than grocery stores, programming that attends to this could be beneficial in increasing food retailing options within a rural community. While cost may not have been a barrier for most rural participants in this study, rural dwellers with limited financial means may face more pronounced challenges accessing food than those reported in this study. Within the rural community included in this study, there was a total low income prevalence of 5.1% in 2015 (as measured by the Low Income Measure After Tax according to the Ottawa Neighbourhood Study, 2019), demonstrating that there are people in that community who have financial limitations who did not participate in this study. Barriers to participation in the program and to participating in evaluation research among this population should be addressed. The MarketMobile may have influenced the introduction of a healthy lunch program which used food from the MarketMobile within one of the urban communities, changing the availability of food within the physical environment in ways beyond the program itself.

### **Strengths and Limitations**

A key strength of this project is including a rural perspective on the benefits of the MarketMobile. Most research in this area has focused exclusively on urban areas. In a recent systematic review of mobile produce markets, only one included study out of twenty-four included a rural perspective (Hsaio, 2018). Rural dwellers may face unique barriers regarding food access and benefit from mobile produce markets in different ways than their urban

counterparts (Haynes-Maslow et al., 2015). It is important to recognize that the rural community included in this study was more affluent than the urban communities were and that no rural participants reported that their income was insufficient to meet their needs. It is possible that differences in perceived outcomes of the program could be explained differences in economic status, rather than geographic setting. Rural residents in this study were able to manage barriers because they had adequate financial resources. They were mindful of their budgets, but their budgets did not constrain them in the same way as reported in the urban sites. Future research on mobile produce markets should include rural residents who also have low incomes to address this.

Another strength is the inclusion of both stakeholder and participant perspectives, particularly as previous research suggests that these tend to diverge in terms of program components that are most important to participants, the importance of food quality versus food quantity for households, and beliefs about why people have difficulty obtaining food (Hamelin, Mercier, & Bédard, 2010). This could interfere with programs effectively helping people and being relevant to their target audience. Both stakeholders and participants in this study emphasized that limited income is the primary barrier to accessing enough food. This recognition is important and can be used to make program decisions to promote sustainability and usefulness. This program likely cannot change people's food insecurity status, but it may contribute to participants' lives in other meaningful ways by including components to address challenges related to food insecurity, such as mental and physical health challenges and social isolation and improving people's geographic access to food, which did help to improve participants' food resources. Additionally, the program provided the opportunity for stakeholders to engage in community development and demonstrate community strengths, which could

contribute to future advocacy efforts to promote policy changes that address food security. Stakeholders and participants agreed on the importance of food quality in this research study, in terms of dietary benefit and in terms of promoting participants' dignity.

Finally, another strength of this research was the collaborative development of the interview protocols for both participants and stakeholders. Developing these materials collaboratively provided the opportunity for the Poverty and Hunger Working Group to apply increased participation (one of the tenets in their mission) in research and evaluation as well as to include the perspectives of people who face barriers to food access in program development and advocacy efforts.

This project has several limitations. As this intervention was delivered and assessed in communities in Ottawa, findings may not be applicable to all settings. Furthermore, convenience sampling was used to select MarketMobile participants. Selection bias may have influenced the study's findings as people who were participants may have had inherent interests that influenced their use of the program (e.g. interest in eating fruits and vegetables, socializing, engaging in community events). This project did not include non-participants, which is a limitation, particularly as food programs have low participation rates (Loopstra and Tarasuk, 2013). This project may have missed an important part of the population who could benefit from such programs but are not currently involved for a variety of reasons. Including this population in future research could help inform community food programming.

Given the nature of the semi-structured interviews, demand characteristics may have been introduced into the study and influenced the participants' interactions with the interviewer and their responses. Efforts were made to minimize this such as asking open ended questions, facilitating a welcoming environment, and by the researcher volunteering and participating

regularly in the delivery of the MarketMobile to reduce the separation between researcher and participants. Future research in this area may benefit from the individuals besides the researcher recruiting and conducting interviews although funding constraints may make this difficult.

### **Conclusions**

The present study adds to the literature by outlining how an emerging type of community food program was seen to contribute to both individuals and communities where food access is limited by financial or geographic constraints. An important consideration for research and practice is the recognition, as voiced by stakeholders and some participants in this study, that mobile food markets only represent a small contribution to food insecurity. Poverty is the root cause of food insecurity and community programs such as mobile produce markets do not lift people out of poverty, although the MarketMobile did seem to help some participants make their money go further. In addition to addressing individual level factors related to food insecurity, these programs should consider how they could address environmental level challenges related to food insecurity, such as through social factors (e.g. role modelling and social support), building community capacity and collaboration among public, private, and community partners, and partnering with other services and resources to promote food access. Strategies to address macro-level influences on food behaviours, such as policy change, were not explicitly addressed by the MarketMobile. Future research should address how food programs could contribute to advocacy efforts for policy change that addresses poverty, the underlying cause of food insecurity.

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## **General Discussion**

The primary objective of this research was to investigate the implementation and perceived impacts of the MarketMobile, a mobile food market in Canada's National Capital Region from both stakeholder and participants perspectives. This program is an example of a community food program designed to address food access in communities where people may be constrained by inadequate financial resources or poor geographic access to food. This research adopted a social-ecological model to study the program because research has demonstrated the need of considering individual and environmental constraints related to food behaviours and diet quality. Two studies conceptualized using a social ecological framework were conducted for this thesis. The first study, reported in the first paper of this dissertation, was a process evaluation examining the development and implementation of the MarketMobile and was guided by a multilevel Theory of Change developed through a participatory research approach. The second study, reported in the second paper of this dissertation, involved an in-depth investigation of perceived program outcomes from the perspectives of program users and program developers in urban and rural areas.

### **Summary and Discussion of Key Findings**

The first study investigated the implementation of the MarketMobile and included the development of a theory of change created collaboratively by program developers and representatives, and the research team; this was used to guide the implementation and outcome research. In summary, implementation findings provided information on program strengths and weaknesses across the delivery sites, according to both participants and stakeholders. A participatory research approach was used for this research because previous research has demonstrated that stakeholder participation may increase relevance and use of evaluation

findings and may improve staff's ability to conduct evaluations. Stakeholder involvement in designing research and implementing and adapting programming can increase the usefulness of these programs, leading to benefits for their programs and users. Involving stakeholders can increase commitment and sense of buy-in as well. Investigating the ability of staff to conduct evaluations was not a specific focus of this research but it prompted the choice to use a participatory approach because it aligned with the goals of the Poverty and Hunger Working Group to engage in efforts to increase advocacy and promote participation and mobilization in communities, as well as a goal of the MarketMobile program to improve collaboration among community partners. In this project, reported benefits of stakeholder involvement were increased critical thinking about the program and its mechanisms of change. Drawbacks were the demands on stakeholders' time and schedules. Advocacy efforts and policy change can be strengthened by research and evaluation and so involving people in these activities may help improve their abilities to work toward these goals. Future research should investigate the role of participatory approaches in food security intervention research to better understand whether this approach contributes to organizational efforts to promote change.

The purpose of the second paper was to describe perceived outcomes of the MarketMobile from the perspective of participants and stakeholders in urban and rural sites. Participants and stakeholders reported some financial, social, psychological, and health-related benefits of the program. Findings from these studies suggest that the MarketMobile included strategies that intersect at multiple levels of influence in Story, Kaphingst, Robinson-O'Brien, & Glanz's (2008) ecological model to achieve outcomes. The program's perceived influences at the individual level included physical and mental health, financial benefits, and changes in self-efficacy through increased behavioural capability. The program helped people buy healthy food

by selling it at a more affordable price. This had implications for the quantity, variety, and quality of produce participants bought which was perceived to positively influence their diets. Engaging in behaviours (e.g. purchasing lower cost fruits and vegetables) that were perceived to benefit their health and their families' health appeared to be beneficial for participants in that it was perceived to reduce stress and increase sense of accomplishment. Despite these benefits, some research on mobile produce markets has demonstrated limited impact of such programs on participants. For example, mobile produce markets were not found to impact participants' belief in their ability to prepare and eat more fruits and vegetables, their perceived access to fresh produce, nor did they impact changes in perceived ability to afford enough food to feed their families (Leone et al., 2018; Gans et al., 2018). One study found differences in fruit and vegetable consumption between intervention and control groups following the implementation of a mobile food market, but this appeared to be due to decreases in consumption in the control group (Leone et al., 2018).

At the social level, the program provided a venue for encouraging social support, role modelling, and social norms to influence food behaviour. This is consistent with some research on mobile produce markets which suggests that these programs contribute to the social environment through offering opportunities to interact with others and by increasing connections between consumers and food producers (Best & Johnson, 2016; Robinson, Weissman, Adair, Potteiger, & Villanueva, 2016). Participants in the present research mostly reported socializing with other participants on market days, and that their positive social interactions with market staff and other customers encouraged them to try new produce. This was also facilitated through activities such as taste tasting offered on site. Some participants also reported that they connected with other market customers and engaged in food sharing and cooking together which they had

not done before the MarketMobile. Although socialization benefits are not as frequently identified as location and convenience benefits promoting use of mobile produce markets, they could still play a role in promoting use and dietary benefits. The theory of change was modified to reflect that activities to promote social interaction among participants and program staff and volunteers might influence program use and help the program achieve intended outcomes. The findings in this research build on existing evidence that efforts to promote social interaction and positive social experiences may help promote uptake and potential dietary outcomes of mobile produce markets (Hsiao 2019).

The findings from this research also emphasize the importance of considering the role of mobile food markets areas across geographical contexts. The MarketMobile was viewed as a catalyst for community change across delivery sites. In urban areas, it was viewed as a way to influence perceptions of lower income communities and to showcase community strengths. For example, media coverage drew attention, both positive and negative, to the communities and some participants discussed the challenge of their communities receiving negative feedback containing stereotypes about people living in lower income communities. Previous research on community food programs in lower income communities suggests that customers report experiencing stigma when accessing programs offering discounted produce and worry about their communities receiving unwanted attention, as these programs draw attention to the lower-income status of these communities (Haynes-Maslow, Auvergne, Mark, Ammerman, & Wiener, 2015). Several stakeholders in this study recognized these concerns as potential barriers to uptake and negative impact on community residents which is promising as some research demonstrates that stakeholders in community food programs may hold stereotyped views about people living in poverty, and view individual characteristics as the cause of poverty and

inadequate diet (Hodgins, 2017; Andrée, Langille, Clement, Williams, & Norgang, 2016; Hamelin, Mercier, & Bédard, 2008). This may interfere with implementing and delivering appropriate programming as it shifts the focus away from other levels of influence and places it on the individual. Service providers should adequately assess participants' needs rather than structuring programs based on preconceived notions of need to maintain participants' dignity (Haynes-Maslow et al., 2015).

The theory of change was modified to include potential stakeholder misconceptions about participants' needs and to include stereotypic assumptions about participants, which have the potential for adverse consequences to participants and their communities, as this were not included in the original conceptualization but may have implications for program outcomes. Engaging with community members and stakeholders to determine appropriate ways of mitigating negative experiences may help address these challenges.

This program clearly influences the physical environment by bringing fresh produce into communities. The program increased availability of produce within the communities, making it more accessible in terms of cost and convenience of location for people who used the program. Influencing the physical environment in this way provided opportunities for dietary changes. The program was viewed as a catalyst for change in both the urban and rural communities. Urban and rural participants perceived that the program impacted their communities by acting as a mechanism through which they could demonstrate their strengths and needs, and that this could be leveraged to secure additional services and programming. For example, during the pilot, a farmers' market was implemented as an offshoot of the MarketMobile in the rural community. It operated on market days and provided an opportunity to build capacity in the community with local businesses and food vendors. A healthy lunch program was implemented in an urban

community using produce from the MarketMobile. Creating settings within communities to support healthy food behaviours is an important component of health promotion strategies (Jackson et al., 2007).

Overall, findings suggest that the MarketMobile may be a promising intervention in communities that have limited access to food but that it is not a sufficient contribution in and of itself. Investing in policies that improve the social-safety net has been shown to improve food insecurity (Loopstra, 2018). Including the individual, social, physical and macro-level environments in conceptualizations of mobile produce markets could support markets in achieving outcomes as this addresses the multiple factors that influence how people access food, what people eat, and offers direction for program activities that support people's ability to obtain healthy food. Macro-level policy interventions to address food insecurity and its root cause, poverty, are needed. As explicitly stated by one urban participant, "It's about money. We can't buy food if we have no money."

### **Limitations**

This project had a number of limitations. First, program characteristics shifted over time. For example, the pilot was extended when the program received additional funding and took an unplanned break prior to starting again in the communities. This changed the initial research plan and may explain attrition at follow-up if participants thought that the program was over. This is consistent with previous community-based research in which implementation and recruitment are common challenges (Leone et al., 2018).

Due to limited resources, the lead researcher was responsible for conducting all interviews. While this was beneficial in terms of familiarizing the researcher with the communities and the interview content, demand characteristics could have influenced participant

responses. To address this, the researcher followed interview scripts to minimize the influence of her own biases, particularly as the interviews were semi-structured. Participants were offered the opportunity to request a copy of their transcript to ensure that they were being represented accurately.

Self-selection bias may have influenced participation in the study. People who participated may have had fewer barriers to accessing community interventions, had an interest in healthy eating, and community participation. Additionally, participation was limited to people who spoke English or French. The participating communities are diverse and people who are not fluent in the two languages would not have been included. People who agreed to participate may have had resources (e.g. time, money, social support, physical abilities) that enabled their involvement that non-participants lacked. These assets could contribute to their ability to access food and community services that promote health and wellbeing, outside of the MarketMobile. As well, people who may have been more marginalized, living in extreme poverty, or faced barriers to accessing the program and could not participate due to these barriers were not represented. As such, the perspectives included in this thesis may not reflect the experiences of people in the community who did not use the program.

### **Implications**

The findings from this research provide support for Story et al.'s (2008) social-ecological model of factors that influence food behaviours and that using this model contributed to our understanding of the MarketMobile's implementation and role in the participating communities. This model allows us to analyze, more holistically, food programs such as the MarketMobile, which included various elements that influence the individual, social, and physical levels of food behaviour included in this model. The MarketMobile project operated at the local scale and did

not include specific activities to influence macro-level changes, but the partnerships behind its development and implementation reflect possibilities for the macro-level influence of mobile produce markets. Macro-level change can be promoted through governmental and business involvement in community coalitions and partnerships, such as the ones in this project, and the theory of change was updated to reflect the importance of advocacy efforts for policy change that could support the work of program such as the MarketMobile. Food security programs can be enhanced by involving local government agencies who have knowledge of their communities' strengths and needs and are able to respond to concerns (B.C. Ministry of Health, 2014).

Integrating food security projects into policies concerning areas such as land use, transportation, income, community development projects, and urban and rural development may be beneficial (B.C. Ministry of Health, 2014). As such, considering these elements and their role is important in developing this kind of program fully, particularly as participants and stakeholders identified elements that benefitted them across multiple levels of influence. For example, individual level components that target people's behavioural capability and self-efficacy such as providing affordable produce and financial incentives are important. Educational and food skills components may be less important in food program, as research suggests that people who are food insecure have adequate knowledge in these areas. However, including nutrition and food preparation information was identified as a mechanism by which some participants decided to try unfamiliar produce, so it could be beneficial for programs to provide this information.

Components that influence the social environment should be included in food security programs. Examples include activities that foster social support and role modelling of healthy food behaviours. Additionally, efforts to promote participant involvement may help encourage program use. For example, previous research suggests that people feel more comfortable

shopping at mobile food markets when staff and volunteers are members of their own communities (Gorham et al., 2015). Additional resources and training may be required to support this. Programs should consider including components that target the physical environment, since these settings may constrain the food that is available in communities. The MarketMobile program made efforts to connect with local business, food vendors, and community organizations and supported the expansion of a farmers' market and a healthy lunch program. Program activities that promote innovation and local food environment development may be a way of increasing food access and encourage healthy food behaviours. Delineating implementation factors that promoted program uptake and customer satisfaction can be used to better understand how these programs can lead to outcomes and to improve programming. This is important for programs, like the MarketMobile, that rely on continued funding and need to demonstrate achieving outcomes.

The first study explored the implementation of the MarketMobile. Needs, barriers, and facilitators to use were investigated. Design elements that promoted use were affordability and quality of produce, location, and staff and volunteers, and the ability of participants to select their own food. An unexpected finding was that some participants contextualized their experiences with the MarketMobile by comparing it to the food bank or grocery store. The MarketMobile allowed for autonomy in food selection in a way many food banks did not and provided support that was perceived to be unavailable at the grocery store. It is important to note that, increasingly, food banks are providing a grocery store model in which the goal is for users to execute more choice and independence in obtaining food compared to previous food bank models (Social Innovation in Food Banks, 2016; Darlington, 2018; White Centre Food Bank, 2017). Nevertheless, these types of experiences were not reported by the participants in this

research. These are important implications for future mobile produce markets to consider and such interventions should provide opportunities that foster participants' ability to make choices in a supportive environment. The second study examined perceived outcomes of the MarketMobile. A key implication of this study is that the program was perceived to influence diet through factors in the social environment (e.g. social support and role modelling) and to influence the physical settings within the communities to provide opportunities for local development and increased food access. This supports conceptualizing mobile food markets using multiple levels and that including strategies that target these levels may contribute to program outcomes.

Community food programming, such as the MarketMobile, is a contribution to food insecurity and related issues but it is a small contribution. Due to the limitations of community food programming, macro-level policies are needed to address the financial limitations that restrict people's ability to obtain adequately nutritious diets. Stakeholders in this research recognized that poverty is the root cause of food insecurity and participants voiced the fact that a lack of money is the main barrier to obtaining fruits and vegetables and other foods that contribute to a healthy diet for themselves and their families. Despite their limitations, programs such as the MarketMobile play an important role for people who face challenges accessing food, even though they do not lift people out of poverty or change people's food security status. They include efforts to build community capacity, support local development, enhance skills and knowledge, and increase participation within communities (Cook, 2008). The MarketMobile appears to have important perceived benefits for participants and their communities that should not be overlooked or minimized. These benefits, such as improved access to fruits and vegetables, increased variety and quality of produce, social benefits, participants' ability to make

choices about the foods they wanted to buy, the opportunity to demonstrate the strengths and needs of their communities are important because they are related to health disparities that are prevalent in people who are food insecure, such as nutritionally inadequate diet, social isolation, and a sense of being restricted in the ability to make choices.

### **Directions for Future Research**

This research explored the implementation and perceived outcomes of a mobile food market in urban and rural communities where people have challenges accessing food, and found support for the intervention in different domains. As the MarketMobile continued operation past the involvement of the research team and beyond the scope of this research project, future research should consider investigating the long-term impacts of this type of food programming. Additionally, studying implementation over a longer time period, as well the impact of this on predicted outcomes, should be done particularly given that the MarketMobile program continued for longer than initially planned and, like many community initiatives, changed over time in response to funding challenges (Glasgow, Vogt, & Boles, 1999).

To address limitations in participant selection in this research, future research should include people who are food insecure as well as other marginalized groups that are more likely to be food insecure. Although being food insecure was not an eligibility requirement for the MarketMobile program or for the research project, it is important to investigate how this population is influenced by this type of intervention, particularly as it was developed as one way of addressing the consequences of food insecurity. Involving participants in the research process and in the process of intervention development and delivery is important to promote continued community participation and to take steps to ensure that programming meets their needs.

This research adds to a growing literature on mobile food markets, which appear to be a somewhat promising strategy in improving fruit and vegetable intake (Gans et al., 2018; Leone et al., 2018). Future research could contribute to this evolving field by examining the role that these interventions have, not only on diet, but on other health related outcomes. Future research may also want to track frequency of use, and factors that influence frequency of use, and non-participation in the program, and associated outcomes as this was not considered and could have implications for program impacts. It could also highlight issues in implementation. Finally, a thoughtful analysis that considers the true costs and benefits of such programs is needed.

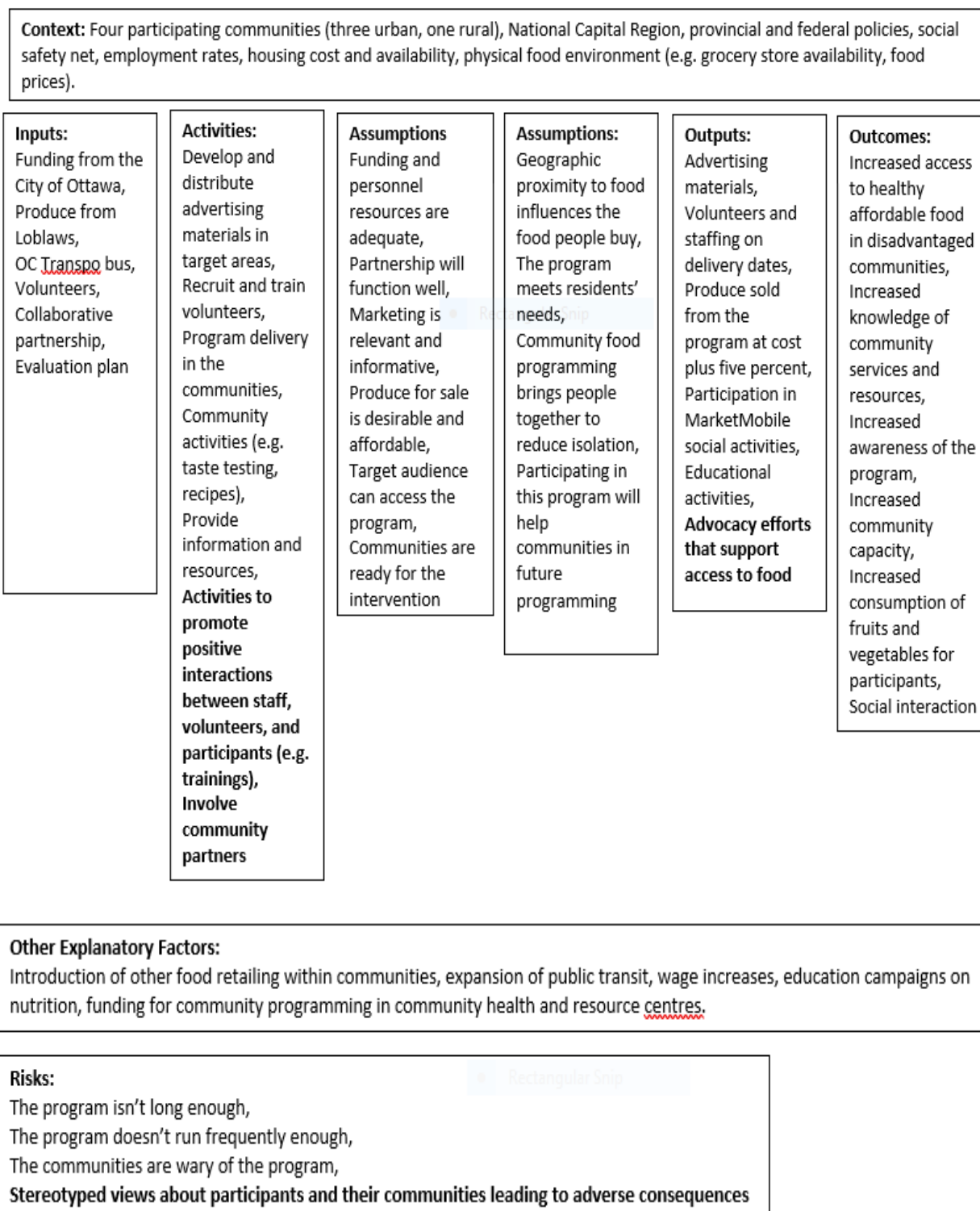
### **Conclusion**

The purpose of this research was to investigate the implementation of a mobile produce market, a growing type of alternative food security programming. This study examined the influence of a mobile produce market at multiple levels using an ecological framework. The findings demonstrate the importance of conceptualizing mobile produce market research using the social-ecological model. Using a lens that does not include multiple levels to illustrate the role of such interventions would neglect key areas of potential benefit for participants. The perspectives of participants and stakeholders suggest that the program had benefits in many areas and that urban and rural participants, and their communities, may be impacted in different ways by such programming. This work's strengths include using a participatory research approach to better understand the MarketMobile's implementation and perceived outcomes. This is a unique contribution in the literature on mobile food markets. Using a participatory approach that involves program developers and users in conceptualizing evaluation and research and participating in the program, could help position stakeholders to advocate for policy change at

the macro-level to support their efforts, through increasing knowledge and skills and strengthening relationships among community partners.

The findings from this study support developing strategies to support local partnerships between mobile markets and community services and agencies, inform policy development aimed at improving access to fruits and vegetables in marginalized communities (Gans, 2018). Promoting access to fruits and vegetables is important, particularly for disadvantaged populations, and future mobile food market efforts should consider the findings from this research.

Figure 1. Modified Theory of Change. Modifications are displayed in bolded text under the headings.



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## Appendix

### Appendix A

#### Letter of Information: Survey (ENGLISH)

**Title of the study:** Implementation Evaluation of a Mobile Food Market in Ottawa.

**Principal Investigator:** Jane Platts

Graduate Student Researcher  
School of Psychology  
University of Ottawa  
Ottawa, ON

**Supervisor:** Dr. Elizabeth Kristjansson

Associate Professor  
School of Psychology  
University of Ottawa  
Ottawa, ON

**Invitation to Participate:** You are invited to participate in a research study conducted by Jane Platts. This study is part of Ms. Platts' doctoral dissertation research and is supervised by Dr. Elizabeth Kristjansson.

**Participation:** Your participation will consist of completing a short survey about your experience with the MarketMobile. Surveys take about ten minutes to complete. You are eligible to participate if you are over the age of 18 and speak English or French. You will also be asked to give some demographic information, like your age, gender, education level, income, and where you were born. You do not have to answer any questions you do not want to answer. If you choose to complete the survey at the MarketMobile, please return it to the researcher in person. If you choose to complete the survey at home, please mail it to the researcher in the stamped and addressed envelope provided. Completion and return of the survey indicates your consent.

**Purpose of the Study:** The purpose of this study is to better understand the MarketMobile. We are interested in hearing what you think about this program, if it meets your needs, and how it could be improved.

**Benefits and Risks:** There are no immediate benefits to participating in this study. My participation in this study will add to knowledge about needs related to food access programs in Ottawa neighbourhoods. It will also help researchers better understand what programs might be useful for improving food access in local communities. There are no foreseeable risks to participation.

**Confidentiality and Anonymity:** The data collected will only be used to evaluate the MarketMobile. No identifying information will be included on the survey. You may provide your name and contact information on a tear-off sheet so that you can be entered in a draw for a prize. Your survey will be kept separately from the tear off sheet for the draw in a secure research office at the University of Ottawa. Only members of the research team will have access to the information.

**Conservation of data:** The data collected will be carefully and securely kept. The researchers listed above will be the only ones who can access it. Surveys and tear-off sheets will be kept in a locked cabinet in Dr. Kristjansson's lab at the University of Ottawa. Electronic copies will be stored on a password protected computer file and backed up on a hard drive that will be stored in the same location. The data will be stored for five years after December 20<sup>th</sup>, 2014. Following the retention period, hard copies of documents will be shredded and electronic data will be securely deleted.

**Compensation:** To thank you for your contribution to the research project, you will be given the option to enter your name in a draw to win one of ten grocery store. There will be two grand prizes: two vouchers valued at \$100. Included in the grand prize draw will be all entries from all four participating MarketMobile communities. There will be a draw in each community for a voucher valued at \$50. There will be a third draw in each community for a voucher valued at \$25. The draw is open to all research participants who enter their name in the draw, regardless of whether they decide to withdraw from further participating in the research project.

On January 5<sup>th</sup>, 2015 names will be randomly selected amongst those who have entered and the persons whose name are drawn for each prize category will be informed by email or telephone. To win the prize, the person must correctly answer a skill testing question. If the person cannot be reached within 14 days from the date of the draw, the prize will be awarded to the second name that is randomly selected for that prize category and so on until the prize has been awarded. The odds of winning depend on the number of entries in the draw. There is one entry per person. The prize must be accepted as awarded or forfeited and cannot be redeemed for cash.

Your name, email address, and telephone number that you provide when you enter the draw is collected for the purposes of contacting you if your name is selected in the draw. Your name and the contact information you have provided will be kept confidential and then destroyed once the prizes have been awarded.

We reserve the right to cancel the draw or cancel the awarding of the prize if the integrity of the draw or the research or the confidentiality of participants is compromised. The draw is governed by the applicable laws of Canada.

**Voluntary Participation:** You are under no obligation to participate and if you choose to participate, you may refuse to answer questions that you do not want to answer. If you choose to withdraw, the information you provide during the study will not be used by the researchers.

If you have any questions or require more information about the study itself, you may contact the researcher or her supervisor at the numbers mentioned herein.

If you have any questions with regards to the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5, tel.: (613) 562-5387 or ethics@uottawa.ca.

Please keep this form for your records.

Thank you for your time and consideration.

Jane Platts (date) \_\_\_\_\_ (signature) \_\_\_\_\_.

Dr. Elizabeth Kristjansson (date)\_\_\_\_\_ (signature)\_\_\_\_\_.

**Please complete this tear-off sheet and return it to the researcher with your survey so that your name can be entered in a draw for a prize. Thank you!**

**Name:** \_\_\_\_\_.

MarketMobile Community (please circle one)

Carlington    Hunt Club                    Morrison Gardens                    Vars

**Contact Information:**

Telephone: \_\_\_\_\_.

Email: \_\_\_\_\_.

Mailing Address: \_\_\_\_\_.

\_\_\_\_\_.

\_\_\_\_\_.

\_\_\_\_\_.

## Appendix B

**Lettre d'information : Sondage (Français)**

**Titre de l'étude :** Évaluation de la mise sur pied d'un marché d'alimentation mobile à Ottawa

**Chercheuse principale :** Jane Platts

Doctorante  
École de psychologie  
Université d'Ottawa  
Ottawa (Ontario)

**Superviseure :** Elizabeth Kristjansson, Ph. D.

Professeure agrégée  
École de psychologie  
Université d'Ottawa  
Ottawa (Ontario)

**Invitation à participer :** Nous vous invitons à participer à une étude de recherche menée par Jane Platts dans le cadre de sa thèse de doctorat, et supervisée par Elizabeth Kristjansson, Ph. D.

**Participation :** Votre participation se résumera à remplir un court sondage au sujet de votre expérience avec le MarchéMobile. Les sondages prennent dix minutes à compléter. Pour pouvoir participer, vous devez avoir plus de 18 ans et parler français ou anglais. Vous aurez à fournir des renseignements sur votre profil démographique comme votre âge, votre sexe, votre niveau de scolarité, votre revenu et votre lieu de naissance. Vous n'êtes obligé de répondre à aucune question. Si vous choisissez de remplir le sondage sur les lieux du MarchéMobile, remettez-le en personne à la chercheuse. Si vous préférez le remplir à la maison, retournez-le par la poste en utilisant l'enveloppe-réponse timbrée qui vous est fournie. En remplissant le sondage et en le retournant, vous donnez votre consentement à participer au projet.

**Objectif de l'étude :** L'étude a pour objectif de mieux comprendre le MarchéMobile. Nous aimerions savoir ce que vous pensez du programme, s'il répond à vos besoins et comment il pourrait être amélioré.

**Avantages et risques :** Votre participation à l'étude n'offre aucun avantage immédiat, mais permettra d'approfondir nos connaissances des besoins associés aux programmes d'accès aux aliments dans divers quartiers d'Ottawa. L'étude aidera également les chercheuses à mieux comprendre quels programmes pourraient aider à améliorer l'accès aux aliments dans les communautés locales. Aucun risque prévisible n'est associé à votre participation.

**Confidentialité et anonymat :** Les données recueillies seront utilisées dans l'unique but d'évaluer le MarchéMobile. Le sondage ne contient aucune question permettant de vous identifier. Vous pouvez inscrire votre nom et vos coordonnées sur la partie à détacher si vous souhaitez participer au tirage. Votre formulaire de sondage sera conservé séparément de la partie à détacher dans un bureau sécurisé de l'Université d'Ottawa. Seuls les membres de l'équipe de recherche auront accès aux renseignements.

**Conservation des données :** Les données recueillies seront conservées en toute sécurité. Les chercheuses nommées ci-dessus seront les seules à y avoir accès. Les sondages et les parties à détacher seront

conservés dans une armoire fermée à clé située dans le laboratoire d'Elizabeth Kristjansson, Ph. D., à l'Université d'Ottawa. Les données électroniques seront sauvegardées dans un fichier protégé par un mot de passe, et une copie de secours sera conservée sur un lecteur de disque dur au même endroit. Les données seront conservées pour une période de cinq ans à compter du 20 décembre 2014. Après la période de conservation, les documents papier seront déchiquetés, et les données électroniques seront supprimées de façon sécuritaire.

**Compensation :** Pour vous remercier d'avoir participé à l'étude, nous vous offrons la chance de gagner l'un des dix bons d'épicerie. Deux grands prix de 100 \$ en bons d'épicerie seront tirés parmi les quatre communautés MarchéMobile participantes. Un bon d'une valeur de 50 \$ et un bon d'une valeur de 25 \$ seront également tirés dans chacune des communautés. Tous les participants qui le souhaitent peuvent s'inscrire au tirage, même s'ils décident d'abandonner l'étude plus tard dans le processus.

Le 5 janvier 2015, des noms seront tirés au hasard parmi les participants, et les gagnants seront joints par courriel ou par téléphone. Pour remporter leur prix, les gagnants devront répondre correctement à une question d'aptitude. Si une personne tirée au hasard ne peut être jointe dans les 14 jours suivant la date du tirage, son prix sera remis à la deuxième personne dont le nom aura été tiré au hasard dans la même catégorie et ainsi de suite, jusqu'à ce que le prix soit décerné. Les chances de gagner d'une personne dépendent du nombre de participants au tirage. Chaque personne ne peut participer qu'une seule fois. Le prix doit être accepté comme tel et ne peut être échangé contre de l'argent.

Votre nom, adresse courriel et numéro de téléphone seront uniquement utilisés pour communiquer avec vous si vous gagnez au tirage. Ces renseignements demeureront confidentiels et seront détruits lorsque les prix auront été décernés.

Nous nous réservons le droit d'annuler le tirage ou de ne pas décerner un prix si l'intégrité du tirage, la recherche ou la confidentialité des participants a été compromise. Le tirage est régi par les lois canadiennes en vigueur.

**Participation volontaire :** Vous n'avez aucune obligation de participer; si vous participez, vous pouvez refuser de répondre à certaines questions. Vous pouvez également annuler votre participation à tout moment, auquel cas les renseignements que vous aurez fournis ne seront pas utilisés aux fins de l'étude.

Si vous avez des questions ou souhaitez en savoir plus sur l'étude, vous pouvez communiquer avec la chercheuse ou sa superviseure en composant les numéros mentionnés plus haut.

Pour toute question relative à la dimension éthique du projet, communiquez avec le responsable de la déontologie en recherche, Université d'Ottawa, pavillon Tabaret, 550, rue Cumberland, salle 154, Ottawa (Ontario) K1N 6N5

Téléphone : 613-562-5387

Courriel : ethics@uottawa.ca.

Veillez conserver ce formulaire pour vos dossiers.

Merci de votre temps et de votre collaboration.

Jane Platts (date)\_\_\_\_\_ (signature)\_\_\_\_\_.

Elizabeth Kristjansson, Ph. D. (date)\_\_\_\_\_ (signature)\_\_\_\_\_.

**Si vous souhaitez participer au tirage, remplissez la section ci-dessous et retournez-la à la chercheuse avec votre sondage. Merci!**

**Name :** \_\_\_\_\_.

Communauté MarchéMobile (encerclez le nom de votre communauté)

Carlington    Hunt Club                    Morrison Gardens                    Vars

**Coordonnées :**

Téléphone : \_\_\_\_\_.

Courriel : \_\_\_\_\_.

Adresse postale : \_\_\_\_\_.

\_\_\_\_\_.

\_\_\_\_\_.

\_\_\_\_\_.

## Appendix C

**MarketMobile User Survey**

**Date:** \_\_\_\_\_ **Postal Code:** \_\_\_\_\_.

1. What MarketMobile location do you mainly visit? (Please circle your answer.)
  - a. Carlington
  - b. Hunt Club
  - c. Morrison Gardens
  - d. Vars
  
2. How do you mainly travel to the MarketMobile site? (Please circle your answer.)
  - a. Personal vehicle
  - b. Taxi service
  - c. Public transportation
  - d. Bicycle
  - e. Walking
  - f. Carpool with another person
  
3. How long did it take you to travel to the MarketMobile from your home? \_\_\_\_\_ Minutes.  
(Please write the number of minutes in the space above (e.g. 10 minutes).)
  
4. How did you hear about the MarketMobile? \_\_\_\_\_.
  
5. I visit the MarketMobile to meet other community members.
  - a. Disagree
  - b. Somewhat Disagree
  - c. Neither Agree nor Disagree
  - d. Somewhat Agree
  - e. Agree
  
6. I visit the MarketMobile to buy fruits and vegetables at a more affordable price than where I usually shop for food.
  - a. Disagree
  - b. Somewhat Disagree
  - c. Neither Agree nor Disagree
  - d. Somewhat Agree
  - e. Agree
  
7. I visit the MarketMobile to buy fruits and vegetables that are important to my culture.
  - a. Disagree
  - b. Somewhat Disagree
  - c. Neither Agree nor Disagree

- d. Somewhat Agree
- e. Agree

8. I visit the MarketMobile to learn more about other programs in my community.

- a. Disagree
- b. Somewhat Disagree
- c. Neither Agree nor Disagree
- d. Somewhat Agree
- e. Agree

9. I visit the MarketMobile because its location is more convenient than where I usually shop for food.

- a. Disagree
- b. Somewhat Disagree
- c. Neither Agree nor Disagree
- d. Somewhat Agree
- e. Agree

10. What do you think about the location of the MarketMobile?

- a. Very good location
- b. Good location
- c. Neutral – no opinion about the location
- c. Bad location
- d. Very bad location

11. How helpful were the MarketMobile staff and volunteers?

- a. Very helpful
- b. Helpful
- c. Neutral – no opinion about staff and volunteer helpfulness
- d. Unhelpful
- c. Very unhelpful

12. How organized was the MarketMobile when you visited?

- a. Very organized
- b. Organized
- c. Neutral – no opinion about program organization
- d. Unorganized
- e. Very unorganized

13. Did you buy food from the MarketMobile? (Please circle your answer.)

Yes

No

14. Please describe the quality of the food for sale at the MarketMobile. (Please circle your answer.)

Very good quality

Good quality

Neutral – no opinion on the quality of the food

Bad quality

Very bad quality

15. Was the food at the MarketMobile (Please circle your answer):

Too Expensive

Affordable

Very inexpensive

No opinion about the cost of the food.

16. How satisfied were you with the variety of the food for sale at the MarketMobile? (Please circle your answer.)

Very satisfied

Satisfied

Neutral

Unsatisfied

Very unsatisfied

17. Was there food that you wanted to buy but it was not available?

Yes

No

If yes, what food did you want to buy? \_\_\_\_\_.

18. Did you enjoy visiting the MarketMobile? Please circle your answer.

Yes

No

No opinion

19. Will you return to the MarketMobile?

Yes

No

I don't know

Why or why not?: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Demographics

20. How old are you? \_\_\_\_\_ years old. (please write # e.g. 18 years old)

21. What is your gender? (please circle your answer)

Male

Female

22. Were you born in Canada? (Please check your answer)

Yes

No

23. What is your country of origin? \_\_\_\_\_.

24. How long have you lived in Canada? \_\_\_\_\_ years. (**e.g. 1 year or half a year**).

25. What is the best way to describe your living arrangement? (please circle your answer.)

a. living alone

b. living with a spouse or partner

c. single parent with children

d. two parent family with children

e. living with parents, other family, or friends

f. other (please specify): \_\_\_\_\_.

g. prefer not to say

26. How many people live in your household? \_\_\_\_\_.

27. What is your highest level of education? (please circle your answer.)

a. Some schooling or completed elementary school

b. Some high school

c. Completed high school

d. Some post-secondary

e. Completed post-secondary

f. Master's, Doctorate, or professional degree

g. Other education or training: please describe: \_\_\_\_\_.

h. Don't know

i. Prefer not to say

28. Do you have any physical health concerns that make it hard for you to get around? (Please circle your answer.)

Yes

No

29. Do you own a car? (Please circle your answer.)

Yes

No

20. What means of transportation do you mainly use when you go grocery shopping? (Please circle your answer.)

- a. Personal vehicle
- b. Taxi service
- c. Public transportation
- d. Bicycle
- e. Walking
- f. Carpool with another person

31. Is your income sufficient to meet your (and your family's) needs?

- a. Always
- b. Mostly
- c. Sometimes
- d. Rarely
- e. Never

Thank you for completing this survey! Your answers will help us improve the MarketMobile so that we can serve you better. Please feel free to leave comments about the MarketMobile below:

## Appendix D

**Sondage à l'intention de la clientèle du MarchéMobile**

**Date :** \_\_\_\_\_ **Lieu (Postal Code) :** \_\_\_\_\_.

1. Où vous rendez-vous le plus souvent au MarchéMobile? (Encerclez votre réponse.)
  - a. Carlington b. Hunt Club c. Morrison Gardens d. Vars
  
2. Comment vous rendez-vous le plus souvent sur le site du MarchéMobile? (Encerclez votre réponse.)
  - g. Avec mon véhicule personnel
  - h. En taxi
  - i. En transport en commun
  - j. À vélo
  - k. En marchant
  - l. En covoiturage
  
3. Combien de temps mettez-vous pour vous rendre au MarchéMobile à partir de la maison? \_\_\_\_\_ minutes. (Inscrivez le nombre de minutes dans l'espace prévu, p. ex. 10 minutes.)
  
4. Comment avez-vous entendu parler du MarchéMobile? \_\_\_\_\_.
  
5. Je vais au MarchéMobile, pour rencontrer des membres de ma communauté.
  - a. pas d'accord
  - b. quelque peu en désaccord
  - c. ni d'accord ni en désaccord
  - d. quelque peu d'accord
  - e. d'accord
  
6. Je vais au MarchéMobile, pour acheter des fruits et des légumes moins chers que ceux offerts dans mon épicerie habituelle.
  - a. pas d'accord
  - b. quelque peu en désaccord
  - c. ni d'accord ni en désaccord
  - d. quelque peu d'accord
  - e. d'accord
  
7. Je vais au MarchéMobile, pour acheter des fruits et des légumes qui sont importants dans ma culture d'origine.
  - a. pas d'accord
  - b. quelque peu en désaccord

- c. ni d'accord ni en désaccord
- d. quelque peu d'accord
- e. d'accord

*(see last response option on next page)*

8. Je vais au MarchéMobile, pour en savoir plus sur les autres programmes offerts dans ma communauté.

- a. pas d'accord
  - b. quelque peu en désaccord
  - c. ni d'accord ni en désaccord
  - d. quelque peu d'accord
  - e. d'accord

9. Je vais au MarchéMobile parce que c'est plus pratique pour moi que de me rendre à mon épicerie habituelle.

- a. pas d'accord
  - b. quelque peu en désaccord
  - c. ni d'accord ni en désaccord
  - d. quelque peu d'accord
  - e. d'accord

10. Que pensez-vous de l'endroit où a lieu le MarchéMobile?

- a. C'est un très bon endroit.
- b. C'est un bon endroit.
- c. Je suis neutre – Je n'ai pas d'opinion sur l'endroit.
- d. Ce n'est pas un bon endroit.
- e. Ce n'est vraiment pas un bon endroit.

11. Le personnel et les bénévoles du MarchéMobile se sont-ils montrés serviables?

- a. Très serviables
- b. Serviables
- c. Je suis neutre – Je n'ai pas d'opinion au sujet des services offerts par le personnel et les bénévoles.
- d. Peu serviables
- e. Très peu serviables

12. Lors de votre visite, le MarchéMobile était-il bien organisé?

- a. Très bien organisé
- b. Bien organisé
- c. Je suis neutre – Je n'ai pas d'opinion sur l'organisation du programme.
- d. Désorganisé
- e. Très désorganisé

13. Avez-vous acheté des aliments au MarchéMobile? (Encerclez votre réponse.)

Oui Non

14. Veuillez décrire la qualité de la nourriture en vente au MarchéMobile. (Encerclez votre réponse.)

- a. De très bonne qualité
- b. De bonne qualité
- c. Je suis neutre – Je n'ai pas d'opinion sur la qualité de la nourriture.
- d. De mauvaise qualité
- e. De très mauvaise qualité

15. Les aliments offerts au MarchéMobile étaient-ils : (Encerclez votre réponse.)

- a. Trop chers
- b. Abordables
- c. Très peu chers
- d. Je n'ai pas d'opinion sur le prix des aliments.

16. Avez-vous été satisfait de la variété des aliments offerts au MarchéMobile? (Encerclez votre réponse.)

- a. Très satisfait
- b. Satisfait
- c. Neutre
- d. Insatisfait
- e. Très insatisfait

17. Est-ce que certains aliments que vous vouliez acheter n'étaient pas offerts?

Oui  
Non

Si oui, quels étaient les aliments que vous vouliez acheter?

18. Avez-vous apprécié votre visite au MarchéMobile? (Encerclez votre réponse.)

Oui  
Non  
Pas d'opinion

19. Avez-vous l'intention de retourner au MarchéMobile?

Oui

Non  
Je ne sais pas  
Pourquoi?

(See next page to ask the participant why)

### Profil démographique

20. Quel âge avez-vous? \_\_\_\_\_ ans (Écrivez votre âge, p. ex. 18 ans.)

21. Êtes-vous un homme ou une femme? (Encerclez votre réponse.)

Homme

Femme

22. Êtes-vous né au Canada? (Cochez la bonne case.)

Oui

Non

23. Quel est votre pays d'origine? \_\_\_\_\_.

24. Depuis combien de temps vivez-vous au Canada? \_\_\_\_\_ ans (**p. ex. un an**)

25. Combien de personnes habitent chez vous? \_\_\_\_\_.

26. Lequel des énoncés suivants décrit le mieux le contexte dans lequel vous vivez? (Encerclez votre réponse.)

a. Je vis seul.

b. Je vis avec un conjoint.

c. Je vis seul avec un enfant.

d. Je vis avec un conjoint et un enfant.

e. Je vis avec mes parents, d'autres membres de ma famille ou des amis.

f. Autre (précisez) : \_\_\_\_\_.

g. Je préfère ne pas répondre.

27. Quel est votre niveau de scolarité? (Encerclez votre réponse.)

j. Études primaires commencées ou terminées

k. Études secondaires commencées

l. Études secondaires terminées

m. Études postsecondaires commencées

n. Études postsecondaires terminées

o. Diplôme professionnel, maîtrise ou doctorat

p. Autre scolarité ou formation (précisez) : \_\_\_\_\_.

q. Je ne sais pas.

r. Je préfère ne pas répondre.

28. Avez-vous des problèmes de santé qui restreignent votre mobilité? (Encerclez votre réponse.)

Oui

Non

29. Possédez-vous une voiture? (Encerclez votre réponse.)

Oui

Non

30. Quel moyen de transport utilisez-vous le plus souvent pour faire votre épicerie? (Encerclez votre réponse.)

g. Votre véhicule personnel

h. Le taxi

i. Le transport en commun

j. Le vélo

k. La marche

l. Le covoiturage

31. Votre revenu est-il suffisant pour répondre à vos besoins et aux besoins de votre famille?

a. Toujours

b. Généralement

c. parfois

d. rarement

e. jamais

Merci d'avoir rempli ce sondage. Vos réponses nous aideront à apporter des améliorations au MarchéMobile et à mieux vous servir. Si vous le souhaitez, vous pouvez également inscrire vos commentaires ci-dessous.

## Appendix E

**Program Fidelity Checklist**

Date: \_\_\_\_\_.

Communities: : \_\_\_\_\_.

<b>Question</b>	<b>Yes</b>	<b>No</b>
1. Did Cibo Foods arrive at 8:45 a.m. at Rideau Rockcliffe CRC?		
2. Did Cibo Foods deliver the correct order of food to the MarketMobile (correct order meaning type and quantity of food)?		
3. Was the food ready for collection at Loblaws in the morning?		
4. Were all ordered food items loaded onto the bus?		
5. Did the MarketMobile arrive at Site 1 at 10:30 a.m.?		
6. Was the MarketMobile open for business for 90 minutes at Site 1?		
7. Did the MarketMobile arrive at Site 2 at 1:30 p.m.?		
8. Was the MarketMobile open for business for 90 minutes at Site 2?		
9. Were “X” number of volunteers present at Site 1?		
10. Were “X” number of volunteers present at Site 1?		
11. Was the program co-ordinator present during today’s program delivery?		
12. Was the food displayed according to plan?		
13. Were fruits and vegetables available for sale on the MarketMobile today?		
14. Were any foods other than fruits and vegetables for sale on site?  If yes, please describe:		
15. Was promotional material distributed to users with each purchase made?		
16. Was there food sold from the MarketMobile at Site 1 today?		
17. Was there food sold from the MarketMobile at Site 2 today?		
18. Did the program run out of food at the Site 1?		
19. Did the program run out of food at Site 2?		
21. Did the MarketMobile drop off leftover food at Rideau Rockcliffe Community Resource Centre between 3:45pm-4:15 p.m.?		

## Appendix F

**Consent Form: Participant Interviews**

**Title of the study:** Implementation Evaluation of a Mobile Food Market in Ottawa

**Invitation to Participate:** I am invited to participate in three interviews for the evaluation of the MarketMobile. This study is conducted by Jane Platts under the supervision of Dr. Elizabeth Kristjansson. This project is part of Ms. Platts' doctoral dissertation research.

**Project Team:** The following people are on our team. They can be contacted if I have questions and/or concerns about the project, what it means, or how it was conducted.

Jane Platts: Graduate Researcher, School of Psychology

Dr. Elizabeth Kristjansson: Faculty Member, School of Psychology

**Purpose of the Study:** The purpose of the study is to evaluate the development and delivery of the MarketMobile. We are interested in understanding how collaboration between different stakeholders contributes to evaluation research.

**Participation:** My participation will consist of participating in three interviews. The first interview will take place during August 2014. The second interview will take place in October 2014. The third interview will take place in December 2014 or January 2014, after the conclusion of the MarketMobile. Interviews will take about one hour each. I will be asked to share my thoughts about what it is like to shop for food in my community, the MarketMobile, its impacts, and how it could be improved. Interviews will take place at a community health resource centre or at a research office at the University of Ottawa at a time that is convenient to me. They will be audio-recorded. I will also complete a short survey asking socio-demographic questions like my gender, ethnicity, and education level.

**Compensation:** I will receive a \$10 grocery store voucher for each interview I complete.

**Benefits and Risks:** My participation will contribute to our understanding of community based food access programs and how they can be improved. There are no foreseeable risks to participation.

**Confidentiality and Anonymity:** I have received assurance from the researcher that the information I will share will remain strictly confidential. I understand that the contents will be used only for evaluation of the MarketMobile and that my confidentiality will be protected as no identifying information will be used in evaluation documents. Consent forms and interviews will be kept separately in a secure research office at the University of Ottawa. Only authorized researchers will have access to the documents. **Anonymity** is guaranteed.

**Conservation of data:** The data collected, such as tape recordings of interviews and interview transcripts (both hard copies and electronic), will be kept in a secure manner in a locked cabinet in the principle investigator's office at the University of Ottawa. The principle investigator and the supervisor will have access to these documents. They will be stored for five years starting December 1<sup>st</sup> 2014. After the principle investigator graduates, these documents will be transferred to a secure cabinet in the supervisor's research office at the University of Ottawa. At the end of the retention period the documents will be destroyed. Hard copies will be shredded and electronic information will be securely deleted.

**Voluntary Participation:** I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, my contribution to evaluation planning and delivery until the time of withdrawal will be included. If I choose to withdraw from an interview, my information will not be included in the study.

**Acceptance:** I, (\_\_\_\_\_), agree to participate in the above research study conducted by Jane Platts (Graduate Student Researcher) of the School of Psychology, Faculty of Social Sciences, University of Ottawa, which research is under the supervision of Dr. Elizabeth Kristjansson.

If I have any questions about the study, I may contact the researcher or her supervisor.

If I have any questions regarding the ethical conduct of this study, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5

Tel.: (613) 562-5387

Email: [ethics@uottawa.ca](mailto:ethics@uottawa.ca)

There are two copies of the consent form, one of which is mine to keep.

Participant's signature:

Date:

Researcher's signature:

Date:

## Appendix G

**Consumer Participant Interview – Time point 1****Introductions**

**Introduction to the Interview:** During our meeting today, I am going to ask you questions about your experiences accessing food, how this makes you feel, and your impressions of the MarketMobile. Please answer these questions by thinking about your experiences in the last year. Everything you tell me will be kept confidential. I am also going to ask you to complete a short socio-demographic questionnaire.

First, we will go over the consent form (**Go over consent**).

Are you ready to get started?

**Food Access Questions**

1. Where do you do most of your food shopping?
  - a. Are these places in your neighbourhood?
  - b. Why do you shop in these places?
  - c. Does being able to shop for food in your neighbourhood matter to you (**community for rural**) Why or why not?
  
2. Are you able to get enough of the food you and your family want and need to eat?
  - a. What makes this difficult for you? (**probe for individual and community level factors**)
  - b. What makes this easy for you? (**probe for individual and community level factors**)
  - c. Are some foods more difficult for you to buy than others? What foods? Why?
  
3. How do you feel when you think about doing your food shopping? (**Probe for concerns, worries**) Do you have concerns about food shopping?
  - a. What are these concerns?

**Community Belonging**

1. How would you describe your sense of belonging in your local community? Would you say it is:  
 very strong    somewhat strong    somewhat weak    very weak
  
2. Can you tell me more about why you described your sense of community belonging in that way?

### **Impressions of the MarketMobile**

1. Why did you visit the MarketMobile for the first time?
  - a. Did you buy food from the MarketMobile? Why or why not?
2. What do you think about the MarketMobile?
  - a. What did you like about it?
  - b. What did you dislike about it?
  - c. Do you think you will continue to use the MarketMobile? Why or why not?
3. How did you hear about the MarketMobile?
  - a. What did you think about the MarketMobile advertising?
  - b. What did you like about the advertising?
  - c. What did you dislike about the advertising?
4. What do you think about having the MarketMobile in your community?
  - a. Do you think that your community needs the MarketMobile?
  - b. Why or why not?
5. Do you think that the MarketMobile impacts your community? If so, how?
6. Do you think that the MarketMobile impacts individuals? If so, how?
7. How can we improve the MarketMobile?
  - a. What would you change about the MarketMobile?
  - b. What would you keep the same about the MarketMobile?

### **Food at Home: Availability and consumption**

Now, I would like to ask you a few more detailed questions about the fruits and vegetables that you usually have in your household.

1. Did you have any of the following kinds of foods in your household in the past week?

Did you have any of the following types of foods in your home in the last week?				Did you consume these foods in the last week? (Requires yes/no response)
Apples	Yes		No	
Oranges	Yes		No	
Bananas	Yes		No	
Grapes	Yes		No	
Leafy Salad Greens			No	

Green or yellow beans	Yes	Frozen or canned	no	
Peas	Yes	Frozen or canned	No	
Carrots	Yes	Frozen or canned	No	
Potatoes	Yes	Frozen or canned	No	
Tomatoes	Yes	Canned	No	
Broccoli	Yes	Frozen	No	
Beans	Dry	Canned	Both	
Lentils	Dry	Canned	Both	
Yoghurt	Yes		No	
Cheese	Yes		No	
Milk	Yes		No	
Kefir				
Tofu	Yes		No	
Chicken	Yes		No	
Beef	Yes		No	
Pork	Regular	Sausage	Bacon	
Hot Dogs	Beef/pork	Chicken/turkey	other	
Lunch Meat	Yes		No	
Fish	Breaded	Not Breaded	Canned	
Eggs	Yes		No	
Peanut Butter	Natural (just peanuts)	Regular		
Oatmeal	Regular (cooking)	Instant	Yes/No	
Bread	Whole Wheat	White	Other	
Cookies	Yes		No	
Candy	Yes		No	
Ice Cream	Yes		No	
Chips	Yes		No	
Pretzels	Yes		No	
Soft drinks/pop	Regular	Diet	Yes/No	
Juice	Yes		No	
Rice	White	Brown	Yes/No	
Pasta	Yes		No	
Popcorn	Yes		No	
Nuts	Yes		No	
Granola Bars	Yes		No	



### 8. What is your household's total income from all sources over the last 12 months?

Count income from every person included in the household.

Include:

- All earnings (include overtime, tips, bonuses, self-employment)
- All pensions
- All student grants and bursaries (but not loans)
- All benefits and tax credits (such as child benefit, income support or pension credit)
- All interest from savings or investments
- All rent from property (after expenses)
- Other income (such as maintenance or grants)

Do not deduct:

- Taxes, National Insurance contributions, Health Insurance Payments, Superannuation payments

<b>Per week</b>	<b>Per year</b>
Less than \$100	Less than \$5,200
\$100 to \$199	\$5,200 to \$10,399
\$200 to \$299	\$10,400 to \$15,599
\$300 to \$399	\$15,600 to \$20,799
\$400 to \$499	\$20,800 to \$25,999
\$500 to \$699	\$26,000 to \$36,399
\$700 to \$999	\$36,400 to \$51,999
\$1,000 to \$1,499	\$52,000 to \$77,999
\$1,500 or more	\$78,000 or more

### 9. Is your income sufficient to meet your (and your family's) needs?

- a. Always
- b. Mostly
- c. Sometimes
- d. Rarely
- e. Never

**Is there anything else you would like to talk about today that we didn't get the chance to cover or that I might have missed?**

## Appendix H

**Consumer Participant Interview – Time 2****Welcome**

**Introduction to the Interview:** Today is our last meeting together. I am going to ask you about what you thought of the MarketMobile since our last meetings and your impressions now that the program is ending. First, I will ask you about the food in your household and then I will ask you about the Market mobile.

1. Last time you told me about your food situation at home (what was good, what concerns them). (a few sentences summarizing their food situation). Has this changed in any way since we last talked? Why do you think that is the case?

**Community Belonging**

1. How would you describe your sense of belonging in your local community? Would you say it is:  
very strong    somewhat strong    somewhat weak    very weak
2. Why do you describe your sense of belonging in this way?
3. Did you get to know any of your neighbours and other community members during your visits to the MarketMobile?
  - a. If so, how did the MarketMobile help with this?
  - b. If not, why not?
4. In your opinion, did the MarketMobile impact your relationship with your community?
  - a. If so, how?
  - b. If not, why not?
5. Did the MarketMobile impact your knowledge of other community programs and resources?
  - a. If so, how?
  - b. If not, why not?

**MarketMobile Impressions**

1. Have you visited the MarketMobile since our last meeting (the second interview)? **(If yes, proceed with 1a, 1b, 1c, then go to question 2. If no, proceed to question 3).**

- a. If so, how many times?
  - b. What are the reasons you kept returning to the MarketMobile?
  - c. Did these reasons change over the months of program delivery? If so, how?
2. Have you noticed improvements in the MarketMobile since the last time we met?
    - a. If so, what are these improvements?
    - b. What changes should be made to the MarketMobile to make it better?
  3. What are the reasons why you did not go back to the MarketMobile?
    - a. What would make you more likely to go to the MarketMobile?
    - b. How can the MarketMobile be improved?
  4. In what ways did the MarketMobile meet your needs and your family's needs?
  5. In what ways did the MarketMobile not meet your needs or your family's needs?
  6. Would you like the MarketMobile to continue coming to your community?
    - a. Why or why not?
  7. What do you think are the benefits of the MarketMobile?

### **Wellbeing**

1. How do you feel now that the MarketMobile program is over?
  - a. Will this impact on the kind of food you and your family have available at home? How?
    - b. Will this impact your community? How?
2. Did the MarketMobile help with your grocery shopping?
  - a. If so, how?
  - b. If not, why not?
3. Did the MarketMobile have an impact on your diet and that of your family?
  - a. If so, how?
  - b. If not, why not?
4. In your opinion, did the MarketMobile impact your wellbeing? (**Probe for physical, social, emotional wellbeing**)
  - a. If so, how?
  - b. If not, why not?
5. In your opinion, did the MarketMobile impact your family's health and wellbeing? (**Probe for physical, social, emotional wellbeing**)
  - a. If so, how?

b. If not, why not?

6. Did the MarketMobile impact your stresses around grocery shopping?

a. if so, how?

b. if not, why not?

### Food at Home: Availability and consumption

Now, I would like to ask you a few more detailed questions about the fruits and vegetables that you usually have in your household.

1. Did you have any of the following kinds of foods in your household in the past week?

Did you have any of the following types of foods in your home in the last week?				Did you consume these foods in the last week? (Requires yes/no response)
Apples	Yes		No	
Oranges	Yes		No	
Bananas	Yes		No	
Grapes	Yes		No	
Leafy Salad Greens			No	
Green or yellow beans	Yes	Frozen or canned	no	
Peas	Yes	Frozen or canned	No	
Carrots	Yes	Frozen or canned	No	
Potatoes	Yes	Frozen or canned	No	
Tomatoes	Yes	Canned	No	
Broccoli	Yes	Frozen	No	
Beans	Dry	Canned	Both	
Lentils	Dry	Canned	Both	
Yoghurt	Yes		No	
Cheese	Yes		No	
Milk	Yes		No	
Kefir				
Tofu	Yes		No	
Chicken	Yes		No	
Beef	Yes		No	
Pork	Regular	Sausage	Bacon	
Hot Dogs	Beef/pork	Chicken/turkey	other	

Lunch Meat	Yes		No	
Fish	Breaded	Not Breaded	Canned	
Eggs	Yes		No	
Peanut Butter	Natural (just peanuts)	Regular		
Oatmeal	Regular (cooking)	Instant	Yes/No	
Bread	Whole Wheat	White	Other	
Cookies	Yes		No	
Candy	Yes		No	
Ice Cream	Yes		No	
Chips	Yes		No	
Pretzels	Yes		No	
Soft drinks/pop	Regular	Diet	Yes/No	
Juice	Yes		No	
Rice	White	Brown	Yes/No	
Pasta	Yes		No	
Popcorn	Yes		No	
Nuts	Yes		No	
Granola Bars	Yes		No	

Is there anything else you would like to add or something important you think I've missed?

Thank you for your time.

## Appendix I

**Recruitment Poster: Interviews (English)**

What do you think about the MarketMobile?  
Does it meet your needs?

Participate in three interviews and have your voice heard!

You will receive three \$10 grocery store vouchers!

Why are we doing this?  
We want to know what you think of the MarketMobile, if it meets your needs, and how it can be improved to serve you better!

Amount of time:  
Three interviews and each takes about 1 hour.

To participate:  
You must be 18 or older and speak English or French

Ask a MarketMobile worker or volunteer how you can participate.

Would you like to participate? Do you need more information?

Please Contact:  
Jane Platts (Graduate Student Researcher at the University of Ottawa)

## Appendix J

**Recruitment Poster: Interviews (Français)**

Que pensez-vous du MarchéMobile?  
Répond-il à vos besoins?

Participez à nos trois entrevues et faites-vous entendre!

Vous recevrez trois chèques-cadeaux d'épicerie de 10 \$ chacun.

Pourquoi?

Nous voulons connaître votre opinion sur le MarchéMobile! Répond-il à vos besoins? Comment pouvons-nous l'améliorer pour mieux vous servir?

Durée

Chacune des trois entrevues dure environ une heure.

Pour participer :

Vous devez être âgé de 18 ans ou plus et parler français ou anglais.

Demandez comment faire à un employé ou à un bénévole du MarchéMobile!

Vous désirez participer? Vous voulez en savoir plus? Nous choisissons les participants selon le principe du premier arrivé, premier servi.

Communiquez avec

Jane Platts (chercheuse au doctorat à l'Université d'Ottawa)

## Appendix K

**Consent Form: Stakeholder Interviews**

**Title of the study:**      **Implementation Evaluation of a Mobile Food Market in Ottawa**

**Invitation to Participate:** I am invited to participate in two interviews for the evaluation of the MarketMobile. This study is conducted by Jane Platts under the supervision of Dr. Elizabeth Kristjansson. This project is part of Ms. Platts' doctoral dissertation research.

**Project Team:** The following people are on our team. They can be contacted if I have questions and/or concerns about the project, what it means, or how it was conducted.

Jane Platts: Graduate Researcher, School of Psychology

Dr. Elizabeth Kristjansson: Faculty Member, School of Psychology

**Purpose of the Study:** The purpose of the study is to evaluate the development and delivery of the MarketMobile. We are interested in understanding how collaboration between different stakeholders contributes to evaluation research.

**Participation:** My participation will consist of participating in two interviews. The first interview will take place during the sixth or seventh week of MarketMobile program delivery. The second interview will take place after the conclusion of the MarketMobile. Interviews will take about one hour each. I will be asked to share my thoughts about the process of planning and delivering the MarketMobile and how it could be improved. Interviews may take place at a community health resource centre or at a research office at the University of Ottawa at a time that is convenient to me. They will be audio-recorded and I will be able to review the transcript of my interview if I want to.

**Benefits and Risks:** My participation will contribute to our understanding of community based food access programs and how they can be improved. There are no foreseeable risks to participation.

**Confidentiality and Anonymity:** I have received assurance from the researcher that the information I will share will remain strictly confidential. I understand that the contents will be used only for evaluation of the MarketMobile and that my confidentiality will be protected as no identifying information will be used in evaluation documents. Consent forms and interviews will be kept separately in a secure research office at the University of Ottawa. Only authorized researchers will have access to the documents. **Anonymity** is guaranteed. My name will not be revealed in any evaluation documents or publications.

**Conservation of data:** The data collected, such as tape recordings of interviews and interview transcripts (both hard copies and electronic), will be kept in a secure manner in a locked cabinet in the principal investigator's office at the University of Ottawa. The principal investigator and the supervisor will have access to these documents. They will be stored for five years starting December 1<sup>st</sup> 2014. After the principal investigator graduates, these documents will be transferred to a secure cabinet in the supervisor's research office at the University of Ottawa. At the end of the retention period the documents will be destroyed. Hard copies will be shredded and electronic information will be securely deleted.

**Voluntary Participation:** I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any

negative consequences. If I choose to withdraw from an interview, my information will not be included in the study.

**Acceptance:** I, ( \_\_\_\_\_ ), agree to participate in the above research study conducted by Jane Platts (Graduate Student Researcher) of the School of Psychology, Faculty of Social Sciences, University of Ottawa, which research is under the supervision of Dr. Elizabeth Kristjansson.

If I have any questions about the study, I may contact the researcher or her supervisor.

If I have any questions regarding the ethical conduct of this study, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5

Tel.: (613) 562-5387

Email: [ethics@uottawa.ca](mailto:ethics@uottawa.ca)

There are two copies of the consent form, one of which is mine to keep.

Participant's signature:

Date:

Researcher's signature:

Date:

## Appendix L

**Steering Committee Representative Interview Time 1**

## Welcome and Introductions

Introduce the Interview: Thank you for meeting with me today. I am going to ask you some questions about your thoughts about the MarketMobile, why you joined the steering committee, and what you think about the process of planning and delivering the MarketMobile. First we will go over the consent form. Then we will start the interview. Do you have any questions or concerns? **(Obtain informed consent)**

Are you ready? **(Begin interview)**

**First, I would like to ask you about your hopes for the MarketMobile project.**

1. What are the program's objectives? **(probe for individual physical, emotional, and social health, and community outcomes)** What things do you hope to accomplish in the short term and the long term?

- a. how will the program accomplish these objectives?
- b. What could get in the way of the program not achieving its goals?
- c. Why do you think community members are using the MarketMobile?

2. In what ways could the MarketMobile impact: **(Probe for how the MarketMobile might result in changes)**

- a. individuals?
- b. the community?

3. What other factors could account for the impacts you anticipate? **(probe for community context factors, alternative explanations). For example, what else is happening in these communities or to the residents that might explain anticipated outcomes?**

4. What is going on in the Market Mobile communities that may contribute to the success of the MarketMobile?

- a. Why do you think these things may contribute to program success?

5. What is going on in MarketMobile communities that may hinder the success of the program?

- a. How do you think these factors could be addressed to promote program success?

**Planning the Program:**

1. Tell me about the process of planning the delivery of the MarketMobile.

- a. What is easy about this process?
- b. What is challenging about this process?
- c. How could the process be improved?

2. Have there been any challenges in the delivery of the MarketMobile?
  - a. If yes, what were they?
  - b. If not, why not?
  - c. how could the challenges be addressed?
  
3. How has the MarketMobile been introduced and advertised in the communities?
  - a. Do you think that this is effective in attracting community members? Why or why not?
  - b. Would you change anything about the advertising? What would you change? Why or why not?
  
4. What are your thoughts about the program's sustainability?
  - a. What would MarketMobile sustainability look like?
  - b. What needs to happen so that the MarketMobile is sustainable?

### **Questions regarding the steering committee**

1. Now I would like you to tell me a little about the steering committee. What is the purpose of the steering committee?
  - a. As a member, what are your responsibilities?
  - b. How do steering committee members contribute to the program?
  
2. Why did you decide to join the MarketMobile steering committee?
  
3. What did you expect of the steering committee?
  - a. Has it met your expectations so far? Why or why not?
  - b. Would you change anything about the steering committee? What would you change?

**(Probe for why they would or would not make changes)**
  
4. What is it like collaborating with many diverse people on the steering committee?
  - a. What do you like about collaboration? Why?
  - b. Is there anything difficult about collaboration with so many stakeholders? Why?
  
5. How has collaboration contributed to the program so far?
  
6. Do you think that all stakeholders on the steering committee have their voices heard and can make a contribution?
  - a. Why or why not?
  - b. If not, how could this be better encouraged?
  - c. If so, how is this encouraged?
  
7. What do you think about the representation of stakeholders on the committee?
  - a. Are some groups over or under-represented? Which groups?
  - b. Do you think that this should be changed? Why or why not?

c. How does this impact the program? (Probe for impacts on planning, delivery, and outcomes).

**Final Question:**

1. Is there anything else important that you would like to talk about today that I might have missed?

## Appendix M

**Steering Committee Representative Interview Time 2****Welcome and Introductions**

**Introduce the Interview:** Thank you for meeting with me again. Last time we talked about the process of planning and delivering the MarketMobile and about what it was like working with many different collaborators. Today, I am going to ask you about how this might have changed over the program. Do you have any questions or concerns?

Are you ready? (**Begin interview**)

**Last time we talked about (say a few words about the objectives they talked about at the first interview).**

1. Do you think the MarketMobile accomplished these objectives? Why or why not?
  - a. Were there any objectives you think the MarketMobile did not accomplish? Why or why not?
2. Do you think that the MarketMobile had impacts? (**Probe for individual and community level impacts**).
  - a. What were these impacts?
  - b. Why do you think it had these impacts?
  - c. What factors, besides the MarketMobile, might have contributed to impacts on individual clients and the community?
3. Did your expectations about the MarketMobile change over the course of the program?
  - a. If so, how did your expectations change?
5. Do you think that the community context impacts the MarketMobile?
  - a. If so, how?
  - b. If not, why not?
  - d. what contextual factors need to be in place to optimize the success of this type of program?
4. What do you think are the benefits of community based food programs, like the MarketMobile? Why? (**Probe for individual and community level outcomes**).
  - a. what are the limitations of these types of programs? Why?

**Program Planning and Delivery:**

3. How did the steering committee contribute to the MarketMobile pilot? (Probe for planning, delivery, and outcomes)

6. Did the process of planning and delivering the MarketMobile change over the course of the pilot?

- a. If so, how?
- b. What did you think about these changes?
- a. If not, was there anything you would have changed?

7. Were there any challenges with **(a)** program planning and **(b)** delivery? **(Ask for specific examples related to both planning and delivery phases)**

- a. If yes, what were they? How were challenges dealt with? Would you change anything about this?
- b. If not, why do you think that things ran so smoothly?

**Now I would like to talk to you about the program steering committee.**

1. Why did you remain on the steering committee over the course of the pilot?

5. Did your expectations of the steering committee change over the course of the pilot?

- a. If so, how?

2. Did the steering committee change over the course of the program? **(Probe for changes related to role, responsibilities, membership)**

- a. If so, how?
- b. What did you think about these changes? Did they help or hurt the program?

8. Do you think that all stakeholders on the committee had their voices heard and made a contribution?

- a. Why or why not?
- b. What might have made stakeholders feel comfortable or uncomfortable expressing their thoughts about the program?
- c. Was participation encouraged? If so, how? How could this be improved?

9. Were there stakeholders missing from the committee?

- a. If yes, what groups should have been on the committee? Why?

10. What would you keep the same about the committee? Why?

- b. What would you change about the committee? Why?

11. Is there anything you would change about the MarketMobile that we haven't talked about today? **(Probe for what they would change and why)**

12. Is there anything important that you would like to talk about today that I might have missed?