

**Guaranteeing a Place at the Table for Everyone:  
An Investigation of Food Insecurity, Poverty, and the Potential  
Benefits of a Guaranteed Basic Income**

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## General Abstract

Although widely used official poverty measures indicate that fewer people are experiencing poverty at the present time in Canada and other high-income countries than in past decades, measures of food insecurity and food bank use show the opposite: that the number of people experiencing poverty in wealthy countries has increased in recent years. Poverty reduction strategies in high-income countries have evolved over the past century into a complex system of programs that include a general income-support (social assistance or ‘welfare’) component along with an array of targeted programs such as disability benefits, housing subsidies, food vouchers, and basic healthcare coverage. In recent decades, social assistance programs have been reformed to incentivize work (i.e., through welfare-to-work or ‘workfare’ initiatives) by enforcing strict eligibility requirements with conditions such as intensive job searching and accepting any available paid work. The reforms also include sanctions for non-compliance in the form of benefit cuts or interruptions. Since these reforms have been implemented, there has also been a proliferation of food banks in high-income countries, which indicates that the reforms have not succeeded in their objective of reducing poverty by transitioning benefit recipients to paid work. An unintended consequence has been an increase in the number of ‘working poor’ due to more people being placed in low-paying and precarious jobs. The conditional social assistance programs have also been criticized for being costly to administer, overly intrusive, and stigmatizing. A guaranteed basic income (GBI), provided by the state without the conditionality of social assistance, has been proposed as a simpler and more efficient way to alleviate poverty but has also been criticized as being unaffordable and for disincentivizing paid work. This thesis examined food bank access in Ottawa, Canada, and the potential benefits of GBI with respect to alleviating poverty. Food insecurity, a fundamental aspect of poverty, is characterized by the lack

of sufficient quantity or quality of food due to financial constraints. People who access food banks for assistance are a particular subset of food insecure people, having lower incomes and more severe levels of food insecurity. We conducted a quantitative 18-month study with 401 participants who accessed one of eleven food banks in Ottawa, to examine the effect of various food bank approaches on food insecurity. We also examined self-reported physical and mental health over time. We found that physical health scores did not change significantly, but there was a slight improvement in the mean mental health score (1.4 points,  $SD = 10$  points,  $p < 0.001$ ) between baseline and endline. Food insecurity improved significantly for participants who accessed food banks that used one of two novel approaches: integrating the food bank within a Community Resource Centre and offering choice to clients in selecting food instead of giving pre-packed hampers. The proportion of participants reporting moderate or severe food insecurity decreased from 73.0% at baseline to 63.8% at the end of the study, indicating that there was an improvement but that most of the participants still reported serious levels of food insecurity. We also conducted a qualitative study in which we carried out 18-month follow-up interviews with eleven of the participants from the quantitative study. We found that there was little change at endline and that all eleven participants had physical or mental health conditions (or both). To examine the effects of basic income interventions, we conducted a systematic review using Campbell review methodology to ensure that it was conducted rigorously. Our searches of academic databases and other sources yielded 24,556 records, which were screened for eligibility, resulting in the inclusion of 27 studies of 10 experiments in our review. Based on the characteristics of the interventions, we developed a typology of five general GBI approaches so that we could analyze the findings of the studies in a meaningful way. Four of the types were intended to replace social assistance benefits; one type provided a supplemental GBI that was

given in addition to other income and benefits. Food insecurity was examined in two studies, both of which found significant improvements. One study found a large reduction in the prevalence of food insecurity (SMD = -0.57, 95% CI: -0.65 to -0.49), the other study found a large reduction in food insecurity scores (SMD = -0.41, 95% CI: -0.57 to -0.26). Several studies found improvements in subjective financial well-being, self-rated life satisfaction, and self-rated mental distress. GBI interventions that provided larger amounts than social assistance yielded more favorable results. Four studies examined self-rated overall physical health, but only one found an improvement. Five studies examined school continuation by youths after the compulsory school age, and all five found significant improvements ( $p < 0.05$  in four studies,  $p < 0.1$  in one). Researchers examining food insecurity have proposed a guaranteed basic income as a solution because food banks are limited in their capacity to alleviate food insecurity. The limited evidence on GBI interventions suggests that a cautious approach should be taken in revising existing social assistance systems. A supplementary GBI would be a safer approach than a replacement of existing programs, and if it led to improvements in poverty-related outcomes, GBI amounts could be gradually increased, and conditional social assistance programs could be gradually and cautiously reduced.

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## Thesis Format and Statement of Co-Authorship

This thesis is comprised of a series of articles based on three studies. The first article (Chapter 2) is titled “The impact of novel and traditional food bank approaches on food insecurity: a longitudinal study in Ottawa, Canada” (Rizvi et al., 2021). The second article (Chapter 3) is titled “More food for thought: a follow-up qualitative study on experiences of food bank access and food insecurity in Ottawa, Canada” (Rizvi, Enns, et al., 2022). Both articles were published in *BMC Public Health*. Chapter 4 contains the manuscript of a systematic review, titled “Effects of guaranteed basic income interventions on poverty-related outcomes in high-income countries: a systematic review,” submitted for publication in January 2024. The proposal for this systematic review was accepted by The Campbell Collaboration, and the title was registered (Campbell Collaboration, 2021), in accordance with Campbell review procedure. The protocol for the review, outlining the methods and reasons for conducting the review, was also published (Rizvi, Welch, et al., 2022), following peer review by three subject matter experts, a methods editor, and an information retrieval specialist.

I, Anita Rizvi, was the lead investigator for all three studies. The first two studies on food banks in Ottawa were part of a larger project initiated by my supervisor, Dr. Elizabeth Kristjansson, and another doctoral student, Aganeta Enns, both of whom are co-authors of the two published articles. The two food bank studies included in this thesis were conducted after I became the project lead in early 2019, and both examine data collected during the last six months of 2019. My roles included project administration, data collection and curation, formal analyses, as well as writing the original and final drafts of the manuscripts.

I led the systematic review from its conception. My roles also included project administration, methodology, data collection, formal analyses, as well as writing the original and final drafts of the manuscript. My supervisor, Dr. Kristjansson, is a co-author of the systematic

review and the protocol, as are two members of my thesis advisory committee, Dr. Vivian Welch and Dr. George A. Wells. Some stages of the systematic review (article screening, data extraction, and risk of bias assessments) had to be conducted by pairs of reviewers, working independently and then reconciling their findings. Because of the time-intensive nature of these tasks and because no external funding was received for this review, a large team was needed to complete the work in a timely manner on a voluntary basis. I extended the opportunity for authorship to team members who invested a substantial amount of their time and who provided input during the writing of the review manuscript. This enabled the screening, data extraction, and risk of bias stages to be completed in four months (mid-September through mid-December 2022, and January 2023) and allowed for diverse and valuable input during the drafting of the manuscript. Additionally, nineteen of the co-authors had previous experience with systematic reviews, and each of them helped to ensure that this review was conducted to a high standard.

The two food bank studies involved people who accessed food banks in Ottawa, so approval for the studies was obtained from the Research Ethics Board of the University of Ottawa. The data used in the systematic review was obtained from published articles, so ethics approval was not needed.

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## Chapter 1: General Introduction

### Poverty and Food Insecurity in Canada

Although Canada is considered to be a developed, high-income country (United Nations, 2022), many Canadians are not able to afford basic necessities for themselves and their families without relying on charity. As a member country of the Group of Seven (G7), Canada is classified as a *major* advanced economy (International Monetary Fund, 2023), and yet, Canadians made over 1.4 million visits to food banks in one month last year (March, 2022) to help feed themselves (Food Banks Canada, 2022). Three years earlier, in March of 2019, this figure was just under 1.1 million (Food Banks Canada, 2019b). Following the increased demand from the aftermath of the 2008 recession, the number of food bank visits declined by around 10% between 2011 and 2019, generally following the decreasing trend in the national unemployment rate. In 2022, however, the unemployment rate fell to a four-decade low of 5.3%, while food bank visits in Canada increased to an all-time high, which is a concerning anomaly caused by rapidly rising inflation and the resulting escalation in the costs of basic necessities (Food Banks Canada, 2022). While high inflation affects almost everyone, people with minimum-wage jobs and fixed incomes from pensions and social assistance have been hit the hardest, exposing “longstanding fissures in our social safety net” (Food Banks Canada, 2022, p. 62).

### Measuring Poverty

While poverty is typically defined as “[being] without or lacking basic necessities” and being “deprived of basic needs,” the extent and prevalence of poverty are difficult to define and measure because of the continuum of people’s economic circumstances. Thus, assigning a simple poverty threshold implies that people just above that point are no longer poor (Sarlo, 2001). Since food is certainly one of people’s most basic needs, the prevalence of food insecurity in a

population can, therefore, provide an effective indicator of how many people are having difficulty in affording this basic need – and by proxy, experiencing poverty. The prevalence of food bank access, which is associated with severe food insecurity and very low incomes, is therefore an indication of a deeper level of poverty experienced by some people in high-income countries.

Food insecurity has been proposed as a more accurate and sensitive indicator of poverty than measures based on income and calculations of the cost of living (Loopstra & Tarasuk, 2013; Power et al., 2016). Popular measures of poverty such as the Official Poverty Measure used in the United States don't consider factors such as geographical variations in the cost of living or the different needs and spending patterns of low-income households (PGPF, 2019). The Canadian low-income cut-off (LICO) measure, developed in the 1960s, does account for family size and community type ('rural' and four city-size categories) (Statistics Canada, 2023). More recently, the Market Basket Measure (MBM) was adopted as the official poverty measure in Canada. This measure considers the estimated cost of basic needs and assigns different thresholds for 53 geographic areas across the country (Statistics Canada, 2022). However, neither measure is able to account for differences in individual needs or differences in the cost of living within geographic regions. In contrast, the severity of food insecurity is closely associated with personal hardships such as rent and bill arrears, pawning of possessions to pay for groceries, and not being able to afford enough milk and fresh fruits and vegetables (Kirkpatrick & Tarasuk, 2011; Loopstra & Tarasuk, 2013).

### **Food Insecurity in High-income Countries**

Food insecurity is defined as “the limited, inadequate, or insecure access of individuals and households to sufficient, safe, nutritious, and personally acceptable foods to meet their dietary requirements for a productive and healthy life” (Tarasuk, 2005, p. 299). Health Canada

further defines *household* food insecurity as “uncertain, insufficient or inadequate food access, availability and utilization *due to limited financial resources*” [emphasis added] (Government of Canada, 2012, para. 2). The concept of ‘household food insecurity’ emerged in the 1990’s to describe food insecurity in high-income countries, which do not face the same challenges to food security as developing countries do (Wunderlich & Norwood, 2006). Food insecurity at the household level is not always associated with hunger, and can also be manifested as the experience of uncertainty of keeping adequate food supplies from day to day and feelings of deprivation of choice, as well as not being able to eat in socially prescribed ways (Radimer et al., 1990). Household food insecurity also entails food and money management strategies that do not apply to individual-level food insecurity, such as mothers allotting a larger share of food to their children than themselves (Campbell & Desjardins, 1989) or not buying clothes so that their children have enough to eat (Enns et al., 2020).

### **Food Insecurity and Health**

There is an unequivocal association between food insecurity in high-income countries and compromised physical and mental health. Evidence of this association has been extensively documented (Gundersen & Ziliak, 2015; McLeod & Veall, 2006; PROOF, n.d.; Seligman & Schillinger, 2010). Food insecure people experience a higher prevalence of health problems, which are exacerbated by limited access to an adequate quantity and quality of nutritious food (Garthwaite et al., 2015). The results of a 2017 report from the United States Department of Agriculture suggest that food insecurity is associated with increased probability of all of the following chronic diseases: hypertension, coronary heart disease, hepatitis, stroke, cancer, asthma, diabetes, arthritis, chronic obstructive pulmonary disease, and kidney disease (Gregory & Coleman-Jensen, 2017). In particular, the results show a gradient whereby people in the ‘low’ and ‘very low’ food security categories face increased risks of all the diseases listed above, but

with the *highest* prevalence in the ‘very low’ category. Meanwhile, in the least severe ‘marginal’ food security category, people face lower risks, but the rates are still significantly higher than in the general population for all of the diseases except hepatitis, stroke and cancer.

### **Inferring Causality**

Despite the wealth of evidence linking food insecurity to poor health, the evidence is severely limited with respect to examining causality – that is, does food insecurity cause poor health, or vice versa? Whether causality exists may depend on the nature of the disease. In the case of depression, this condition is usually described in the literature as a consequence of the stress of food insecurity (Leung et al., 2015; Munger et al., 2016; Whitaker et al., 2006; Wu et al., 2018). However, a 4-year study of 25,050 families in the United States reported that severe maternal depression increased the likelihood of household food insecurity by 69%. (Noonan et al., 2016). Still, the authors acknowledged that their research model “may reflect reverse causality.” With regards to a different disease such as diabetes, a study from the United States reported a gradient such that diabetes self-management became increasingly difficult as food security declined (Ippolito et al., 2017). A particularly stark finding was that people in the ‘very low’ food security category were 6.7 times more likely than those in the food secure category to make trade-offs due to financial constraints in whether they purchased food, or medicine and supplies like test strips and lancets. In contrast, a Canadian study found no significant impact of food insecurity on self-management practices, and the authors suggest that this may be due to many of the related healthcare costs being covered by the government (Gucciardi et al., 2009).

The question of causality in regard to food insecurity and health is aptly summarized on the website of the PROOF Food Insecurity Policy Research organization: “food insecurity could be both an outcome and cause of poor health, or another factor (e.g. poverty) could be a cause of both” (PROOF, n.d., para. 3). The causal relationship between *poverty* and health is much more

established: while some diseases and disabilities can make it difficult to secure paid employment and ultimately lead to poverty, the direction is more often the reverse, from poverty to poorer health (Phipps, 2003; Pickett & Wilkinson, 2015). Additionally, the World Health Organization describes a vicious circle wherein poverty leads to ill health, and ill health maintains poverty (due to lost wages and healthcare costs) so that the poor remain poor (Wagstaff, 2002).

### **Food Insecurity and Food Banks**

Food insecurity was reported by 18 percent of Canadians (6.9 million) in 2022 (PROOF, 2023). Comparing this figure to the 1.4 million monthly visits to food banks in 2022 indicates that roughly one in five Canadians who faced food insecurity chose to visit a food bank for assistance. This is consistent with the findings of a previous Canadian study using data from 2008, which found that 21% of food-insecure people went to a food bank for help, and that these people had much lower incomes and more severe levels of food insecurity than food-insecure people who did *not* visit a food bank (Tarasuk et al., 2020).

All of the empirical studies found on food insecurity acquired data in one of two ways: either from population health surveys (usually at the national level) or by directly surveying people who visit food banks for food assistance. Analyses of this data confirm the distinction between the population of people who experience food insecurity, and those within this category who actually go to food banks for assistance. The latter group appears to be a non-representative subset that comprises about one fifth of the food-insecure population – the people who rely on food banks have the lowest incomes, with most depending on social assistance benefits as the primary source of income, and they are five times less likely to be homeowners than food insecure people in general (Loopstra & Tarasuk, 2015).

The stigma and feelings of humiliation and shame associated with asking for assistance from food banks makes accessing their services a ‘last resort’ option for people who are food

insecure. For those who do ask for assistance, there may be an additional dimension to the negative experience because when assistance is received “the compulsory gratitude feels degrading” (Horst et al., 2014, p. 1514). People will more often ask friends or family for help, and not pay bills on time to have money for food, before they choose to go to a food bank (Loopstra, 2018; Middleton et al., 2018; Tarasuk et al., 2020). As such, food bank use can be considered as an indication of greater financial hardship than food insecurity alone.

### **Food Bank Limitations**

Since the 1980’s, food banks have become the primary response for alleviating food insecurity in high income countries, but their effectiveness in achieving this goal is severely limited because of their dependence on charitable donations (Caraher & Furey, 2018; Tarasuk et al., 2014). Aside from the challenge of distributing adequate quantities of food, food banks are also limited in accommodating specific diets based on medical, religious or cultural grounds; as a result, food that is received and cannot be eaten is often thrown out (Kuhls, 2011; Moffat et al., 2017; Remley et al., 2010). The proliferation of food banks in high income countries over the last four decades has served to increase public awareness of the problem of food insecurity; at the same time, food banks have also become the de facto ‘solution’ for alleviating food insecurity, absolving government of the responsibility of looking after one of its marginalized populations (Hannah & Tiina, 2020; Riches & Tarasuk, 2014; Rose & Booth, 2017).

### **Income-Support Policies, Programs, and Interventions**

Because household food insecurity is, by definition, due to financial constraints, it follows that an effective solution would necessarily involve mitigating the financial constraints of food insecure people. The traditional approach for doing so – and for addressing poverty in general – has been in the form of ‘social assistance’ or ‘welfare’ policies and programs offered by various levels of governments (federal, state/provincial/regional, or municipal).

Since 2000, there has been a small but growing body of research on the effects of government policy interventions on household food insecurity. Over the same period of time, there has also been a surge in interest in various types of innovative income-support programs, such as universal basic income, to address poverty and the rapid growth in income inequity due to declines in medium-income job numbers. And since 2020, the recent pandemic has caused additional and severe economic turmoil, resulting in financial hardship for tens of millions of people in high income countries, so the calls for basic income programs have become much more urgent (Arnold, 2020; Fong, 2020).

Many types of income-support programs have been proposed for alleviating poverty, and many experiments have already been conducted in Canada, the United States and Europe (de Paz-Báñez et al., 2020; Gentilini et al., 2020; Gibson et al., 2020; Hasdell, 2020), but currently used measures of poverty may not be as sensitive or accurate as food insecurity level to properly guide policy. A preliminary search of the literature showed that some of the basic income experiments that are now under way and that have already been completed include food insecurity as an outcome of interest (Hoynes & Rothstein, 2019; McDowell & Ferdosi, 2020; McIntyre et al., 2016 Social Rights Area, 2019); therefore, a systematic review of the effectiveness of new income-support programs in alleviating food insecurity appeared to be feasible.

### **Rationale for Performing Longitudinal Food Bank Studies**

Studies involving food insecure people who rely on food banks are important for several reasons:

1. All the data on food insecurity from population surveys is based on self-reported information from a cross-section of the population. Although surveys of people who access food banks also rely on self-reporting, the information comes from

- people who have requested food assistance and who have had to prove that they are eligible to receive food assistance.
2. Governments and policy makers may assume that food banks are solving the food insecurity problem, so the voices of the people who access food banks are needed to provide a ‘sounding board’ as to the benefits food banks actually provide and in what ways they may fall short.
  3. Because people who rely on food banks comprise a particularly vulnerable subset of all food insecure people, they may have unique needs that could remain hidden when the population data is amalgamated and averaged. If new policies are implemented to reduce poverty, it is important that they help the most disadvantaged people in the food insecure population.

### **Objective**

The objective of this thesis is to synthesize the findings of the two food bank studies (one qualitative and one quantitative), with the findings of a systematic review on the effectiveness of guaranteed basic income interventions for alleviating poverty in high-income countries. I hypothesize that certain types of guaranteed basic income may be effective in eliminating or reducing poverty, as indicated by improvements in food security and other poverty-related measures.

## **Chapter 2: The Impact of Novel and Traditional Food Bank Approaches on Food Insecurity: A Longitudinal Study in Ottawa, Canada (Article 1)**

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### **Abstract**

**Background:** Food insecurity is strongly associated with poor mental and physical health, especially with chronic diseases. Food banks have become the primary long-term solution to addressing food insecurity. Traditionally, food banks provide assistance in the form of pre-packed hampers based on the food supplies on hand, such that the food items often do not meet the recipients' cultural, religious or medical requirements. Recently, new approaches have been implemented by food banks, including choice models of food selection, additional onsite programming, and integrating food banks within Community Resource Centres.

**Methods:** This study examined changes in food security and physical and mental health, at four time points over eighteen months at eleven food banks in Ottawa, Ontario, Canada. The participants – people who accessed these food banks – were surveyed using the Household Food Security Survey Module (HFSSM) and the Short-Form Health Survey Version 2 (SF-12). Statistical analyses included: pairwise paired t-tests between the mean perceived physical and

mental health scores across the four waves of data collection, and longitudinal mixed effects regression models to understand how food security changed over time.

**Results:** The majority of people who were food insecure at baseline remained food insecure at the 18-month follow-up, although there was a small downward trend in the proportion of people in the severely food insecure category. Conversely, there was a small but significant increase in the mean perceived mental health score at the 18-month follow-up compared to baseline. We found significant reductions in food insecurity for people who accessed food banks that offered a Choice model of food distribution and food banks that were integrated within Community Resource Centres.

**Conclusions:** Food banks offer some relief of food insecurity, but they don't eliminate the problem. In this study, reductions in food insecurity were associated with food banks that offered a Choice model and those that were integrated within a Community Resource Centre. There was a slight improvement in perceived mental health at the 18-month time point; however, moderately and severely food insecure participants still had much lower perceived mental health than the general population.

## **Introduction**

Household food insecurity, defined as the inadequate or insecure access to food due to financial constraints, is a growing health problem in Canada that adversely affects mental, physical, and social health, and strains our healthcare system (Gundersen et al., 2018; Tarasuk & Mitchell, 2020). The magnitude of the problem is alarming considering that in 2017-2018, one in eight households in Canada faced food insecurity, which translates into nearly 4.4 million people, including more than 1.2 million children. The number of people living in food-insecure

households in 2017-2018 constitutes the highest rate since national monitoring began in 2007 (Tarasuk & Mitchell, 2020).

Past research has highlighted the many negative health consequences associated with food insecurity (Gundersen & Ziliak, 2015; Ramsey et al., 2012; To et al., 2014), including a multitude of chronic conditions, such as arthritis, back problems, hypertension, diabetes, and cardiovascular disease (Che & Chen, 2001; Ford, 2013; Gucciardi et al., 2009; Tait et al., 2018). Additionally, adults with mobility impairments are inordinately affected by food insecurity (Schwartz et al., 2019). Food insecurity likewise has an enduring effect on children's wellbeing, with studies linking the exposure to food insecurity at an early age with increased risk of developing asthma, depression, and suicidal ideation in adolescence and early adulthood (Kirkpatrick et al., 2010; McIntyre et al., 2013, 2017).

Food insecurity has been associated with nutritional vulnerability. In Canada, adults in food-insecure households reported lower dietary intake of energy, macronutrients and micronutrients in comparison to their food secure counterparts; adolescents who were food insecure also reported some nutritional deficits (Kirkpatrick & Tarasuk, 2008). People living in food insecure households reported limited social support and poorer social cohesion in their neighbourhoods (Boston et al., 2013; Leung et al., 2015) compared to food secure households.

Food banks emerged in Canada in the early 1980's as a short-term measure to ameliorate a surge in food insecurity due to job losses after a downturn in the oil industry and the subsequent economic recession (Riches, 1986). The number of visits to Canadian food banks has been climbing since then, with 1,084,386 visits reported across the Canadian Food Bank Network in March 2019 (Food Banks Canada, 2019; Holmes et al., 2018). In the absence of comprehensive government policies, food banks have continued to propagate, and these agencies

are now the first line of response to the issue of hunger and food insecurity in Canada (Tarasuk et al., 2016).

With respect to terminology, food banks in Canada serve the functions of both ‘food pantries’ – the local not-for-profit agencies that provide food assistance directly to people in need – as well as the central warehouses which are referred to as food banks in the United States, and which distribute food to various types of front-line food programs (Feeding America, 2020). In the United Kingdom, the term ‘food pantry’ refers to a “membership scheme” which allows members to obtain a limited number of food items, typically redistributed surplus stock from supermarkets, for a nominal weekly fee (Human Rights Watch, 2019). In Canada, some organizations offer low-cost meal programs, but unprepared food items are only available through food banks. While this food assistance is free to the people who visit food banks, the frequency of visits is usually limited to once per month, with the goal of providing a few days’ worth of groceries during each visit. In this paper, we use the term “food bank” to refer specifically to local agencies that provide food items at no cost directly to individuals, with one exception being the Ottawa Food Bank (OFB) organization, which operates a central warehouse facility that serves 112 member agencies in the Ottawa area. Each community food bank serves a specific geographic area of Ottawa and provides food to 400 or more people per month. To receive assistance, people do not need referrals from other agencies; however, the food banks typically require people to provide documents during their first visit to verify their identity, address, and source(s) of income. On subsequent visits, proof of address is also required to show that the person lives in the area serviced by the particular food bank.

Despite the escalation of food bank use in recent decades, food banks have limited capacity to alleviate the needs of those who seek assistance (Tarasuk et al., 2014). Furthermore, although conventional food bank models may be linked with short-term improvement in

household food security and health (Roncarolo et al., 2016), these agencies have a limited capacity to offer food of adequate quality and variety due to their reliance on donations (Tarasuk et al., 2014). Furthermore, people report experiencing stigma, embarrassment, frustration and shame when accessing a food bank, because they often receive food that is left over/unsold, high in sugar and fat, and often past the best-before date (Horst et al., 2014; Middleton et al., 2018).

Change is taking place in the ways that food banks provide food assistance (Greater Vancouver Food Bank, 2016). Contemporary approaches to improving services include increasing the quality and choice of food provisions, establishing safe and welcoming spaces, and providing greater integration with health care and health promotion (Tarasuk et al., 2016). Recent studies have examined the potential benefits of Choice models (Jones et al., 2019; Martin et al., 2013; Mukoya et al., 2017), in which people visiting food banks can select food items from displays, as in a grocery store, instead of receiving pre-packed hampers. Research is also emerging on food banks which offer an array of services such as nutrition education, life-skills training, and health and social support services, in addition to food assistance (An et al., 2019; Aragon et al., 2019; Chapman, 2017; Martin et al., 2019; Vivian et al., 2014); however, the existing research documents a significant heterogeneity in the types of supplementary services offered.

Although the number of food banks in Canada has been proliferating for more than four decades, there is a dearth of studies describing and evaluating both traditional strategies as well as the newer, more novel approaches (Caspi et al., 2017; Greater Vancouver Food Bank, 2016; Levkoe & Wakefield, 2011; Martin et al., 2013). To help fill this gap, we collaborated with the Ottawa Food Bank (OFB) to plan and carry out this study, which was conducted in collaboration with eleven community food banks within the OFB network.

There is also a gap in the literature regarding the health of people who access food banks, which are a specific sub-population of food insecure people in general. Studies have found that less than one quarter of people in food insecure households in Canada rely on food banks, and that the people who do access food banks are not a representative subset of the food insecure population, having substantially lower incomes and higher rates of receiving social assistance benefits than food insecure people who do not access food banks (Loopstra & Tarasuk, 2015; Tarasuk et al., 2020). We found five quantitative studies that examined the health of people who relied on food banks in Europe and North America (Depa et al., 2015; Farahbakhsh et al., 2017; Kaiser & Hermsen, 2015; Loh et al., 2020; Roncarolo et al., 2016); however, none of these studies were of a longitudinal nature with participants who accessed food banks on a long-term basis. All the other literature we reviewed on household food insecurity and health relied on data from cross-sectional population surveys.

## **Methods**

### ***Study Aims***

The main aim of this study is to model changes in food insecurity over time and identify their associations with different types of food bank approaches offered in Ottawa. We also report on food bank use and examine whether physical and mental health change over the 18-month period.

### ***Study Design***

This observational prospective study was conducted from November 2017 until December 2019 and involved repeated surveys of the same cohort of participants over four time points. A baseline survey and three follow-up surveys were conducted at intervals of approximately six months, such that there was a total span of approximately eighteen months

between the baseline survey and the final survey for each participant. (The complete surveys are included in a companion article by Enns (Enns, 2020)).

This study was originally planned to last two years, with a fourth follow-up survey at the 24-month time-point; however, due to significant attrition and many surveys from participants being returned incomplete, we chose to end the study after the 18-month follow up, which still provided an adequate sample size to yield statistically meaningful results (details are provided in the Sample Size and Attrition section below). The decision to omit the 24-month time point was also based on receiving feedback from some participants who expressed annoyance at the 18-month time point over being contacted repeatedly for the follow-up surveys.

### ***Participants and Setting***

The participants in this study were people who accessed community food banks in Ottawa, Ontario, Canada. Eleven of twenty-six community food banks within the Ottawa Food Bank (OFB) network were included in this study. The eleven food banks were identified and recruited in collaboration with the OFB, which is the central collection and distribution hub of the network. Partners at the OFB distributed an email to community food bank coordinators within their network that included study information and an invitation to directly contact a member of the University of Ottawa research team (by phone or email) if they were interested in taking part and facilitating data collection at their food bank. The research team member who received correspondence from interested food bank coordinators then invited coordinators to in-person meetings to provide further study information, answer questions, and gather information on food bank operations. Each food bank that participated in this study serves a specific geographic area of Ottawa and provides food to 400 or more people per month.

The participants were recruited in the food bank waiting areas. Individuals were approached and given information about the study, and if they were interested in participating,

they were asked to read a consent form. People who were 18 years of age or older were eligible to participate. Those people who provided signed consent were then given several options for completing the initial baseline survey: (i) filling out a paper version, (ii) completing an electronic version on a tablet, (iii) completing the survey in private with a research assistant who would read the questions out, or (iv) completing an online version at home, using the Internet URL provided in a handout.

The six-, twelve- and eighteen-month follow-up surveys were completed over the phone, or by email with a link to access an online version, or by regular mail using a printed paper version which could be returned in a supplied, postage-paid envelope.

As an incentive to join the study, participants in the baseline survey were invited to enter a draw for one of eight \$50 grocery store gift cards at the time of consenting to take part in the study. Participants who indicated that they would like to enter the draw were also asked for their preferred contact method and information and were assigned a random ID number. At the end of the baseline data collection periods, IDs were entered into a random number generator to select the eight winners. Everyone who participated in the six-month follow-up survey received a \$5 grocery store gift card by mail, and everyone who participated in the twelve- and eighteen-month follow-ups received a \$10 grocery store gift card for each survey. The amount was increased from \$5 to \$10 to encourage retention due to the significant attrition which was observed at the six-month follow-up.

### ***Survey Questionnaire Design***

The survey questionnaire sought to measure the participants' demographics, duration and frequency of food bank access, level of food insecurity, and self-reported physical health and mental health. The timeframe of the questions pertained to the previous six months (i.e., for each

question we asked: “In the past 6 months...”) to obtain data that matched the 6-month intervals between our follow-ups.

Food security was measured using the Household Food Security Survey Module (HFSSM), an 18-item measure used by Health Canada, based on the Core Food Security Module developed by the United States Department of Agriculture to be a benchmark measure of household food security, which has been used and validated widely in North America (Bickel et al., 2000).

Perceived mental and physical health were measured using the 12-item version of the Short-Form Health Survey Version 2 (SF-12) (Ware et al., 1996). The SF-12 is a widely used measure of self-reported health. It has demonstrated good reliability and validity among diverse populations (Chum et al., 2016). The SF-12v2 has also been shown to be a valid outcome indicator among marginalized or vulnerable populations (Chum et al., 2016; Larson, 2002). The Physical and Mental Health Composite Scores (PCS and MCS) are continuous variables measured on a scale from 0 to 100, where 0 indicates poor perceived health, and 100 indicates excellent perceived health.

### ***Statistical Analysis***

We conducted descriptive statistics to demonstrate demographic characteristics of participants who completed one or more of the four surveys in this study. We reported the mean and standard deviation of participants’ age, perceived physical and mental health scores at the four waves of data collection. Proportions of people with different gender identities, education; monthly income; marital status; whether participants were born in Canada or abroad; their ethnicity; marital status and whether they live with dependents or not are summarized. Participants’ descriptive statistics were also summarized by food security level over the four

waves of data collection. Moreover, we reported on participants' demographic characteristics by food bank use and perceived physical and mental health.

To measure change in physical and mental health across the four waves of data collection, we performed pairwise paired t-tests between the scores of the physical and mental health of the within-subject factor (i.e., across waves of data collection). *P*-values were adjusted using the Bonferroni multiple testing correction method (Noble, 2009).

To examine food bank use in each of the four waves of data collection, we asked about and reported frequency of use of food banks in the three months preceding each survey.

### ***Modelling Food Insecurity***

Finally, we conducted longitudinal mixed effects regression models to understand how food security changed during the four waves of data collection and to understand their associations with different types of food bank approaches offered in Ottawa. Participants were nested within the four time points of data collection.

### ***Main outcome measure:***

We constructed two variables using the Household Food Security Survey Module (HFSSM), following Carlson et al. (1999) and Bickel et al. (2000):

- 1) A continuous food security variable on a ten-point scale (i.e., from 1 to 10, where 1 indicates food secure and 10 indicates severely food insecure). and
- 2) A categorical variable with scores categorized as: 0=food secure, 1=marginal food insecurity, 2=moderate food insecurity, or 3=severe food insecurity.

We used both categorical and continuous scales as each of them serve a particular purpose in our analysis:

The Food Security Scale is a continuous linear scale, developed to measure the degree of severity of food insecurity/hunger experienced by a household in terms of a single numerical

value. As explained in detail by Carlson et al. (Carlson et al., 1999) and Bickel et al. (Bickel et al., 2000), we used it in the regression models to show the precise change in food security levels, and associations with novel and traditional food bank approaches.

We also decided to show food security as a categorical variable for descriptive purposes, providing a small set of categories, each one representing a meaningful range of severity of food insecurity. The cuts offs were developed by Bickel et al. (Bickel et al., 2000). Categorical variables serve well in describing the sample but will not show the precise change in food security scores, so we used both categorical and continuous variables to analyze our data.

### ***Main Variables of Interest***

The main variables of interest (the independent variables / IVs) were the food banking models used in the eleven participating food banks:

- 1) Food bank type: integrated within a Community Resource Centre (CRC IV): a dichotomous variable: 0 = not CRC, 1 = is a CRC
- 2) Choice distribution model (Choice IV): a dichotomous variable: 0 = Hamper model, 1 = Choice model.
- 3) Additional onsite programming (Programs IV): a dichotomous variable: 0 = no, 1 = yes

We conducted a Chi-squared test between the CRC and Choice models as well as the CRC and Program models to examine their independence.

Six of the eleven food banks offered additional onsite programming, which included food-related programs such as community kitchens, as well as support for finding employment or affordable housing, or applying for social assistance.

Three of the food banks were situated within Community Resource Centres (CRCs) which provide wraparound services, so that emergency food assistance, community programs,

and health and social services were all offered in one place. In comparison, the additional onsite programming model is limited to helping people to find and access such services elsewhere, as the food bank itself is not integrated within a CRC.

Four of the food banks offered food assistance via a choice or ‘grocery shopping’ model, whereas the other seven provided food supplies in the form of a food hamper, with some offering choice of certain items by way of a food options list. In the choice model as referred to in this paper, people are invited to walk around a food display area, typically with a volunteer, and choose food items that they and their family need and want.

Food bank characteristics were not mutually exclusive as two of the food banks employed a combination of the novel food banking approaches. However, based on the results of our contingency analysis (shown further below) and the aim of this study, each food banking approach was analysed separately.

### ***Covariates***

Individual characteristics included in the analyses were: age at baseline, gender, monthly household income, having dependents in the household or not, ethnicity, whether born in Canada or not, married/living with a partner or not, perceived physical health and perceived mental health.

### ***Sample Size and Attrition***

We used the Generalized Linear Mixed Model Power and Sample Size (GLIMMPSE) software (<https://glimmpse.samplesizeshop.org>) to estimate the sufficient sample size to model food security score, using a multi-level mixed effect model with repeated measures across four waves of data collection. The sufficient sample size estimated to detect a target power of 0.8 with a Type I error rate of 0.05 was 229 participants. Our sample size used in the analysis was 369

participants with 1040 observations across the 4 waves of data collection, which was sufficient to detect a meaningful effect.

We started with 730 participants at baseline who answered surveys. The surveys which were returned with over 50% unanswered questions were judged to have insufficient data to be imputed and did not contain sufficient data on the variables of interest to be included in the analyses for this study. Participants who answered less than 50% of questions in any of the four surveys were excluded, resulting in a sample size of 401 participants at baseline. There were 399 participants who completed surveys at two or more time points.

Our colleague Enns (Enns, 2020) performed a statistical comparison of all the recruited participants and those who completed the six-month follow-up and did not find any significant differences in their demographic characteristics; i.e., the participants who were excluded at baseline or who did not complete the six-month survey were not significantly different from the follow-up participants, in terms of education, gender, ethnicity, being born in Canada, marital status or having dependents.

In the current study, an attrition analysis was conducted for each of the three follow-ups, to understand whether people who did not participate in some waves of data collection dropped out at random or whether significant differences in sample characteristics existed between people who answered the survey and those who were missing in each wave. No significant differences were found between baseline sample characteristics of the group that answered the survey and those who dropped out in each wave of data collection in terms of age  $p$ -value (attrition W2= 0.1073, attrition W3= 0.2582, attrition W4= 0.4173), perceived physical health  $p$ -value (attrition W2= 0.5273, attrition W3= 0.5188, attrition W4= 0.8808), mental health  $p$ -value (attrition W2= 0.2912, attrition W3= 0.3114, attrition W4= 0.8417), and food security level  $p$ -value (attrition

W2= 0.7674, attrition W3= 0.5373, attrition W4= 0.8808). These results suggest that participants dropped out at random.

In the four waves of data collection for the eighteen-month study, there were: 401 participants who responded with complete data in wave 1; 320 in wave 2; 311 in wave 3; and 271 in wave 4. Out of the 401 participants at baseline, two did not complete any of the follow-up surveys. The remaining 399 participated in either two, three or four points of data collection. Some participants skipped a wave, and then returned to answer in a following wave. In total, 189 participants answered the surveys of all four waves of data collection, 125 participants answered the surveys of three waves, and 85 participants answered the surveys of two waves. Across all waves, this sums up to a total of 1303 valid responses, and 301 missing ones.

We imputed missing data only for time-constant variables that were reported by participants in one wave of data collection, but missing in others; for example, if in one wave of data collection a participant did not report their age, gender, education, ethnicity, whether they were born in Canada or not, data was imputed from their answers from another wave. However, for all variables that can change over time – for example food security, income, marital status, perceived mental and physical health – missing data was not imputed.

In longitudinal data analysis using mixed effects regression models, two points in time can be used in the analysis without the need to impute missing data, if the missing data is “missing completely at random”; hence, the analysis provides valid inferences, with no need to impute, delete, or weight (Rabe-Hesketh & Skrondal, 2008).

Data preparation, cleaning and analyses were conducted in Stata 13.1 and R Studio 4.0.1.

## Results

### *Descriptive Statistics*

**Sample Characteristics in Each Wave of Data Collection.** At baseline, 401 participants answered a set of demographic questions. As shown in Table 2.1, the majority of the sample at baseline were: born in Canada (68.8%), white (53.4%), women (50.9%), not married or living with a partner (64.3%), with no dependents (52.1%), and had some (i.e., not completed) college education or less (61.8%). Around 79.8% of participants' household income in the month preceding the baseline survey was less than \$2400 (i.e., less than \$28,800 per year). Missing data for each variable is indicated in Table 2.1. Across all waves of data collection, the largest share of participants in each demographic category was found to be: women; people born in Canada; not married or living with a partner; with no dependents; and who had less than a college degree.

**Table 2.1***Sample Demographic Characteristics by Data Collection Wave*

Characteristic	Wave 1 N=401	Wave 2 N=320	Wave 3 N=311	Wave 4 N=271
<b>Age (years)</b>				
Mean (SD)	43.9 (13.4)	44.5 (12.9)	44.3 (13.5)	44.3 (13.2)
<b>Gender</b>				
Men	163 (40.6%)	128 (31.9%)	116 (28.9%)	104 (25.9%)
Women	204 (50.9%)	169 (42.1%)	170 (42.4%)	145 (36.2%)
Gender diverse	34 (8.5%)	23 (5.7%)	25 (6.2%)	22 (5.5%)
Missing	0 (0%)	81 (20.2%)	90 (22.4%)	130 (32.4%)
<b>Education</b>				
Some college or less	248 (61.8%)	198 (49.4%)	192 (47.9%)	160 (39.9%)
College degree	67 (16.7%)	55 (13.7%)	52 (13.0%)	44 (11.0%)
Bachelor's or graduate degree	51 (12.7%)	44 (11.0%)	38 (9.5%)	43 (10.7%)
Other	35 (8.7%)	23 (5.7%)	29 (7.2%)	24 (6.0%)
Missing	0 (0%)	81 (20.2%)	90 (22.4%)	130 (32.4%)
<b>Monthly Income (CAN\$)</b>				
0-599	60 (15.0%)	36 (9.0%)	32 (8.0%)	21 (5.2%)
600-1199	163 (40.6%)	131 (32.7%)	112 (27.9%)	100 (24.9%)
1200-1799	75 (18.7%)	59 (14.7%)	75 (18.7%)	67 (16.7%)
1800-2399	22 (5.5%)	24 (6.0%)	31 (7.7%)	25 (6.2%)
2400 or more	12 (3.0%)	12 (3.0%)	31 (7.7%)	23 (5.7%)
Missing	69 (17.2%)	139 (34.7%)	120 (29.9%)	165 (41.1%)
<b>Born in Canada</b>				
Yes	276 (68.8%)	225 (56.1%)	211 (52.6%)	192 (47.9%)
No	101 (25.2%)	82 (20.4%)	80 (20.0%)	63 (15.7%)
Missing	24 (6.0%)	94 (23.4%)	110 (27.4%)	146 (36.4%)
<b>Ethnicity</b>				
White	214 (53.4%)	173 (43.1%)	163 (40.6%)	150 (37.4%)
First Nations/Metis/Inuit	36 (9.0%)	32 (8.0%)	25 (6.2%)	21 (5.2%)

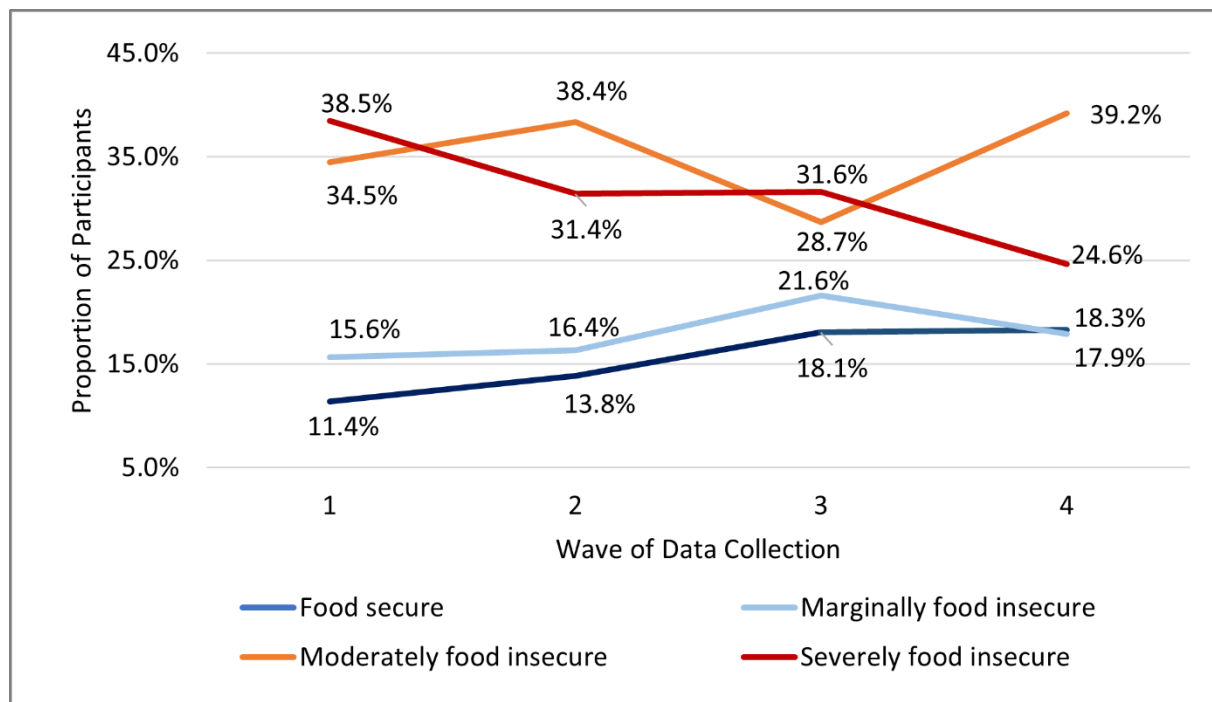
Characteristic	Wave 1 N=401	Wave 2 N=320	Wave 3 N=311	Wave 4 N=271
Visible minority	151 (37.7%)	115 (28.7%)	123 (30.7%)	100 (24.9%)
Missing	0 (0%)	81 (20.2%)	90 (22.4%)	130 (32.4%)
Marital status				
Not married*	258 (64.3%)	220 (54.9%)	220 (54.9%)	193 (48.1%)
Married*	120 (29.9%)	89 (22.2%)	90 (22.4%)	78 (19.5%)
Missing	23 (5.7%)	92 (22.9%)	91 (22.7%)	130 (32.4%)
Dependents				
No dependent	209 (52.1%)	169 (42.1%)	168 (41.9%)	140 (34.9%)
One or more dependents	166 (41.4%)	137 (34.2%)	141 (35.2%)	129 (32.2%)
Missing	26 (6.5%)	95 (23.7%)	92 (22.9%)	132 (32.9%)
Physical health (SF12 subscale)				
Mean (SD)	45.2 (9.76)	43.9 (11.6)	44.2 (12.1)	43.5 (11.2)
Mental health (SF12 subscale)				
Mean (SD)	40.2 (11.3)	40.4 (11.7)	40.8 (13.9)	41.6 (11.9)

*Note.* ‘Missing’ values include non-responses due to both attrition and unanswered questions within surveys. \*‘Married’ includes living with a partner.

**Food Security.** As show in Figure 2.1 below, when comparing the overall change in food security from the first wave of data collection to the last wave, the proportion of people who were food secure increased, and the proportion of people that were severely food insecure decreased. Over the eighteen-month time span, there was an increase of seven percentage points (from 11% to 18%) in the proportion of participants in the food secure category, an increase of five percentage points (from 34% to 39%) in the moderately food insecure category, whereas there was an overall decrease of 14 percentage points (from 39% to 25%) in the severely food insecure category.

**Figure 2.1.**

*Proportion of Participants in Each Wave by Food Security Level*



**Frequency of Food Bank Use in the Previous Three Months.** Overall, the percentage of people who visited food banks one or more times in the preceding three months decreased over time. In the first wave of data collection, 52.1% of people who used the food banks used them three or more times in the previous three months, compared to 40.9% in wave 2, 32% in wave 3, and 27.4% in wave 4.

In the first wave of data collection, the majority of participants (52.1%) used food banks three or more times in the preceding six months, followed by those who visited the food banks once (23.2%) or twice (20.4%). The largest proportion of participants visited the food banks three or more times in all waves of data collection.

**Perceived Physical and Mental Health.** The mean perceived physical health scores ranged from 45.2 (SD 9.76) in wave 1 to 43.5 (SD 11.2) in wave 4, while the mean perceived

mental health scores ranged from 40.2 (SD 11.3) in wave 1 to 41.6 (SD 11.9) in wave 4 (Table 2.1).

No significant difference between the mean perceived physical and mental health by waves of data collection were detected, with the exception of the mean perceived mental health between wave 1 and wave 4 ( $p < 0.001$ ).

**Descriptive Statistics by Levels of Food Security.** Table 2.2 summarizes the demographic characteristics of participants over the four waves of data collection for each food security category. As shown in the table, participants who accessed the food banks were between the ages of 18 and 80 years old. There was an age gradient in food security: the mean age at baseline of people who were severely food insecure (42.2 years, SD 12.0) was five years lower than those who were food secure (47.2 years, SD 14.9). Across all four waves of data collection, there were 688 responses from women and 511 from men. Across food insecurity categories, the largest difference between men (35.4%) and women (57.6%) was in the moderately food insecure category.

Overall, out of 1,111 responses on household income, 931 responses (83.8%) indicated an income of CAN\$1799 or less per month. As well, an income gradient was found between people in different food security categories: among participants who were severely food insecure, only 5.1% had a monthly household income of CAN\$2400 or more, compared to 10.9% of participants who were food secure.

There was a significant relationship between food security level and average perceived physical and mental health: those with higher levels of food security had higher levels of perceived health (Table 2.2). The mean physical health scores ranged from 47.2 for those who were food secure, to 42.5 for those who were severely food insecure. Similarly, the mean mental health scores ranged from 48.8 to 35.8 for the same categories.

**Table 2.2**

*Demographic Characteristics by Level of Food Security (Using Aggregated Responses from All Four Waves of Data Collection)*

Characteristic	Food secure (N=192)	Marginally food insecure (N=226)	Moderately food insecure (N=446)	Severely food insecure (N=409)
<b>Age (years)</b>				
Mean (SD)	47.2 (14.9)	46.1 (14.0)	43.9 (13.0)	42.2 (12.0)
<b>Gender</b>				
Men	72 (37.5%)	99 (43.8%)	158 (35.4%)	173 (42.3%)
Women	112 (58.3%)	106 (46.9%)	257 (57.6%)	208 (50.9%)
Gender diverse	8 (4.2%)	21 (9.3%)	31 (7.0%)	28 (6.8%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<b>Education</b>				
Some college degree or less	118 (61.5%)	141 (62.4%)	257 (57.6%)	274 (67.0%)
College degree	26 (13.5%)	29 (12.8%)	101 (22.6%)	61 (14.9%)
Bachelor's or graduate degree	36 (18.8%)	32 (14.2%)	56 (12.6%)	47 (11.5%)
Other	12 (6.2%)	24 (10.6%)	32 (7.2%)	27 (6.6%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<b>Household income (CAN\$)</b>				
0-599	9 (4.7%)	21 (9.3%)	50 (11.2%)	66 (16.1%)
600-1199	51 (26.6%)	81 (35.8%)	183 (41.0%)	187 (45.7%)
1200-1799	46 (24.0%)	56 (24.8%)	100 (22.4%)	72 (17.6%)
1800-2399	23 (12.0%)	18 (8.0%)	37 (8.3%)	22 (5.4%)
2400 or more	21 (10.9%)	16 (7.1%)	20 (4.5%)	21 (5.1%)
Missing	42 (21.9%)	34 (15.0%)	56 (12.6%)	41 (10.0%)
<b>Born in Canada</b>				
Yes	108 (56.2%)	139 (61.5%)	330 (74.0%)	321 (78.5%)
No	77 (40.1%)	69 (30.5%)	95 (21.3%)	77 (18.8%)
Missing	7 (3.6%)	18 (8.0%)	21 (4.7%)	11 (2.7%)

Characteristic	Food secure (N=192)	Marginally food insecure (N=226)	Moderately food insecure (N=446)	Severely food insecure (N=409)
<b>Ethnicity</b>				
White	99 (51.6%)	109 (48.2%)	251 (56.3%)	236 (57.7%)
First Nations/Metis/ Inuit	12 (6.2%)	15 (6.6%)	41 (9.2%)	46 (11.2%)
Visible minority	81 (42.2%)	102 (45.1%)	154 (34.5%)	127 (31.1%)
Missing	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<b>Marital status</b>				
Not married*	116 (60.4%)	146 (64.6%)	323 (72.4%)	298 (72.9%)
Married*	74 (38.5%)	74 (32.7%)	115 (25.8%)	107 (26.2%)
Missing	2 (1.0%)	6 (2.7%)	8 (1.8%)	4 (1.0%)
<b>Dependents</b>				
No dependent	93 (48.4%)	120 (53.1%)	234 (52.5%)	232 (56.7%)
one or more dependents	96 (50.0%)	98 (43.4%)	201 (45.1%)	171 (41.8%)
Missing	3 (1.6%)	8 (3.5%)	11 (2.5%)	6 (1.5%)
<b>Physical health (SF12 subscale)</b>				
Mean (SD)	47.2 (10.7)	45.7 (11.2)	43.7 (11.3)	42.5 (10.7)
<b>Mental health (SF12 subscale)</b>				
Mean (SD)	48.8 (11.5)	44.5 (12.2)	39.6 (11.4)	35.8 (10.8)
<b>Frequency of use of food bank</b>				
0	34 (17.7%)	30 (13.3%)	39 (8.7%)	39 (9.5%)
1	36 (18.8%)	55 (24.3%)	101 (22.6%)	90 (22.0%)
2	39 (20.3%)	38 (16.8%)	79 (17.7%)	86 (21.0%)
3 or more	83 (43.2%)	103 (45.6%)	225 (50.4%)	193 (47.2%)
Missing	0 (0%)	0 (0%)	2 (0.4%)	1 (0.2%)

*Note.* ‘Missing’ values refer to unanswered questions within surveys. \*‘Married’ includes living with a partner. ‘Frequency of use of food bank’ refers to the previous three months.

### ***Contingency Analysis***

The Chi-squared test between CRC and Choice model was not significant ( $p$ -value = 0.7), which indicates that the variables are correlated. The same finding ( $p$ -value = 0.63) was found between the CRC and additional programming models, indicating that these variables are also correlated. As a result, we did not put the three variables in one model to predict food security scores, but instead tested each variable separately.

### ***Longitudinal Regression Models***

We modeled the trajectory of the food security index, a continuous variable from one to ten where one is the most food secure, and ten is the most insecure. The results are summarized in Table 2.3.

The mixed effect regression model (a growth curve model/trajectory model) revealed that with every year increase in age at baseline, the food security score decreased by 0.03 units over time (i.e., food insecurity decreased with age). Being a woman was related to a decrease of 0.38 units in the food insecurity score compared to being a man. Being not born in Canada was related to 0.57 units decrease in the food insecurity score. Increased income was related to a decrease in food insecurity: having a monthly income of \$1800 or more was related to 0.42 units of decreased food insecurity. Every 10 points increase in the physical health index was related to 0.4 units in decreased food insecurity; similarly, every 10 points increase in mental health index, was related to 0.5 units in decreased food insecurity.

After the first wave of data collection, food insecurity decreased over time by 0.78 units, 0.98 units in wave 2, and one unit in wave 3 compared to baseline, as shown in Table 2.3.

### **Table 2.3**

*Food Security Trajectories by Food Bank Type: Integrated Within CRC , Offering a Choice Model, and Offering Additional Programming*

Predictors of Food Insecurity (on HFSSM score)	CRC		Choice model		Additional programming	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
CRC (ref. not in CRC)	-.595**	[-.993, -.196]	---	---	---	---
Choice (ref. hamper model)	---	---	-.534**	[-.894, -.174]	---	---
Additional programming (ref. no additional programming)	---	---	---	---	-.164	[-.518, .191]
Age at baseline	-.028**	[-.042, -.013]	-.028**	[-.042, -.013]	-.029**	[-.044, -.015]
Gender (ref. men)						
Women	-.384*	[-.755, -.014]	-.395*	[-.765, -.024]	-.397*	[-.7731, -.021]
Gender diverse	.468	[-.555, 1.491]	.474	[-.550, 1.498]	.596	[-.441, 1.633]
Ethnicity (ref. First Nations)						
White	.391	[-.218, .999]	.357	[-.252, .966]	.376	[-.240, .992]
Visible minority	.185	[-.311, .681]	.159	[-.336, .654]	.139	[-.363, .641]
Born in Canada (ref. yes)						
No	-.572*	[-1.107, -.037]	-.537*	[-1.070, -.003]	-.512	[-1.052, .0279]
Income (ref. \$0-\$599)						
\$600-\$1799	-.151	[-.490, .189]	-.143	[-.483, .197]	-.154	[-.495, .188]
\$1800 +	-.425	[-.864, .0138]	-.411	[-.850, .0278]	-.439	[-.880, .001]
Dependents (ref. yes)						
No	0.185	[-.153, .5222]	.218	[-.120, .555]	.193	[-.146, .532]
Marital status (ref. married)						
Not married	-.243	[-.585, .099]	-.249	[-.591, .094]	-.224	[-.568, .120]
Physical health (PCS)	-.038**	[-.050, -.026]	-.037**	[-.049, -.0248]	-.037**	[-.049, -.0249]
Mental health (MCS)	-.051**	[-.061, -.040]	-.050**	[-.061, -.0394]	-.050**	[-.061, -.039]
Food bank use (ref. Accessed yes)						
No	.550**	[.163, .937]	.549**	[.158, .932]	.541**	[.152, .929]

Predictors of Food Insecurity (on HFSSM score)	CRC		Choice model		Additional programming	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
Time (ref. baseline)						
6 months	-0.788**	[-1.216, -.359]	-0.780**	[-1.208, -.351]	-0.774**	[-1.203, -.345]
12 months	-0.989**	[-1.396, -.583]	-0.987**	[-1.393, -.581]	-0.979**	[-1.386, -.571]
18 months	-1.090**	[-1.498, -.681]	-1.088**	[-1.496, -.680]	-1.080**	[-1.488, -.671]
Constant	11.17**	[10.02, 12.32]	11.13**	[9.98, 12.29]	11.10**	[9.93, 12.27]
Random-effects Parameters	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
SD(_cons)	1.439	[1.300, 1.592]	1.441	[1.303, 1.594]	1.462	[1.323, 1.617]
SD(Residual)	1.367	[1.296, 1.443]	1.367	[1.295, 1.442]	1.366	[1.295, 1.442]
Intraclass correlation	0.53	[0.46-0.58]	0.56	[0.5-0.62]	0.51	[0.44-0.58]

Note. \* indicates  $p < 0.05$ ; \*\* indicates  $p < 0.01$ ; 'Married' includes living with a partner.

For participants who went to a food bank connected with a CRC, the food insecurity score was lower by 0.59 units compared to those who went to a regular food bank. For participants who went to a choice-model food bank, the food insecurity score was 0.53 units less than for those who went to hamper-model food banks. Additional onsite programming was not associated with any decrease or increase in food security. Having not accessed a food bank in the preceding three months was related to a higher likelihood of being food insecure, with the greatest increase observed for those who were marginally food insecure.

Having a higher age at baseline, being not born in Canada, married or living with a partner, with higher income, and higher perceived physical and mental health scores were associated with less food insecurity. For all other variables, the impact of the variable on the different food insecurity categories was not statistically significant. In the CRC model, the Intraclass correlation (rho) shows that 53% of the variance was explained by between-participants variance, as opposed to 56% in the Choice model, and 51% in the Program model.

## Discussion

In this study, 271 out of 401 participants (67.6%) responded during the final eighteen-month follow-up. Part of the observed attrition could be explained by findings from a large-scale longitudinal study conducted in Vancouver, Canada (Black & Seto, 2020). These researchers found that the majority of people who access food banks could be characterized as “short-term, transitional users who visited food banks a handful of times and disengaged after a few weeks or months of use,” and that the 9% who accessed food banks over a long-term accounted for 65% of all food bank visits. Thus, a significant number of the participants in our study at baseline may have only needed food assistance over a short term. We were often unable to contact participants for follow-ups because the contact information they provided was no longer valid (e.g., telephone was out of service and mailing address had changed), so it is impossible to say if they moved elsewhere to seek employment, or moved in with a friend, partner or relative, or became homeless.

As described above in the Methods section, those who participated in the 6-month follow-up were given a \$5 grocery store gift card, and for the subsequent follow-ups the amount was increased to \$10 to encourage retention due to the 20% attrition seen at 6 months. The increased incentive appears to have been successful since the incremental attrition rates at the 12- and 18-month time points were lower at 2% and 10%, respectively.

In terms of income, which is necessary for purchasing food, the results fit with what we would expect to find, as participants with the lowest income were more heavily represented in the severely food insecure category. Conversely, the highest percentages of participants with CAD\$1800 or more in monthly income were in the food secure category.

Food insecurity was higher for participants who were not married and not living with a partner. This may be because people who are married or live with a partner share major expenses

like rent, and therefore may have more money for food if they both have incomes. As well, if one partner loses some or all of their income, the other partner's income may 'cushion' the economic impact. Lastly, single parents working in the service industry find it problematic to work varied hours for relatively low wages, and also schedule paid childcare, so they may not be able to earn sufficient income to maintain their food security (Coleman-Jensen, 2011).

In terms of gender, the majority of participants in our study were women (683 total responses in all four waves by women compared to 502 responses by men). The greatest disparity was in the moderately food insecure category, in which there were 38.5% less responses from men than from women. Our regression analysis found that food insecurity among women in our study was 0.38 points lower on the 10-point food insecurity scale (where a lower score means less food insecurity).

The higher proportion of women participants in our study may have been due to an unintended gender bias in the recruitment process, or the results above (lower number of men, but with higher food insecurity than women) may also reflect sociocultural attitudes that men should behave stoically and not ask for help except in dire circumstances. A 2012 study in Montréal, Canada involved in-depth interviews with 22 men experiencing poverty, followed by six discussion groups to validate the results, which suggested that "asking for help can be diametrically opposed to traditional masculine roles" and that, when facing a serious problem, men will ask for help only as a last resort (Dupéré et al., 2012).

There were notable differences between the demographics of the participants in this study and those of the general population of Ottawa, based on the 2016 Census figures from Statistics Canada. In terms of education, the census showed that 63.7% of people in Ottawa had a postsecondary certificate, diploma, or degree (Statistics Canada, 2017), compared to 29.4% of the participants in the baseline survey. Our result closely matches that of a 2005 study in

Toronto, Canada, which found that 27.4% of people accessing food banks in Toronto had completed college or university (Lightman et al., 2008); however, our result is very different from a US study using national data which found that less than 8% of people that received assistance from food pantries between 2002 and 2014 had a college degree (US meaning, similar to university) (Heflin & Price, 2019). The Toronto study found a drastic increase – from 12% in 1995 to 53% in 2005 – in the percentage of immigrants with some college or university education among those who received assistance from food banks, so the higher numbers of educated people accessing food banks in Canada, versus the United States, may reflect Canadian immigration policy.

We found that participants born in Canada reported significantly higher food insecurity than those who were not born in Canada. This is also likely due to Canadian immigration policies, which require people coming to Canada as immigrants to be skilled or well educated or to possess a prescribed amount of liquid assets (Government of Canada, 2007).

In terms of income, only 3% of the participants at baseline reported a monthly household income of \$2,400 (\$28,800 per year) or more, compared to 86% of all residents in the city of Ottawa having an annual household income of \$30,000 or more in 2016 (Statistics Canada, 2017). Although 17% of the participants in our study did not provide income information, the results still indicate a huge income gap between people who visit food banks and other people in Ottawa.

In terms of ethnicity, 9% of the participants in our study were Indigenous (First nations, Metis, or Inuit), which is almost double the 4.6% of people in all of Ottawa who are Indigenous (Statistics Canada, 2017). This result echoes the urgent need to address the inequity in food security faced by off-reserve Indigenous people in Canada (Willows et al., 2009).

Consistent with previous research that found poorer health was correlated with food insecurity (Che & Chen, 2001; Gundersen & Ziliak, 2015; Ramsey et al., 2015; To et al., 2014), we found the mean perceived physical and mental health scores of our participants to be below the general population mean of 50 points (Ware et al., 1996). Moreover, perceived physical and mental health scores both showed gradients across food insecurity levels, such that health scores decreased as the severity of food insecurity increased. Participants in the food secure category scored closest to 50 points, with means of 47.2 for perceived physical health and 48.8 for perceived mental health, suggesting that their health was close to that of the general population.

While previous research has also found evidence of gradients in mental and physical health according to the severity of food insecurity (Gregory & Coleman-Jensen, 2017; Jessiman-Perreault & McIntyre, 2017; Parker et al., 2010; Seligman et al., 2010; Tarasuk et al., 2013, 2015), those studies depended on national health surveys (i.e., the Canadian Community Health Survey, and the National Health and Nutrition Examination Survey in the U.S.) to obtain data on household food insecurity and did not focus specifically on people who accessed food banks. Other studies have found that less than one quarter of people in food insecure households in Canada relied on food banks, and that the people who do access food banks were not a representative subset of the food insecure population, having substantially lower incomes and higher rates of receiving social assistance benefits than food insecure people who had not accessed food banks (Loopstra & Tarasuk, 2015; Tarasuk et al., 2020). As such, the examination of perceived physical and mental health in the current study relates to a unique subset of the food insecure population. Our finding that the largest proportions of participants across all waves were in the CAD\$600-1199 bracket may reflect that many of the participants in our study received modest social assistance benefits as their source of income.

Physical health score means ranged from 47.2 for food secure participants to 42.5 for those who were severely food insecure. Mental health score means were even lower for moderately and severely food insecure participants at 39.6 and 35.8, respectively. Since the standard deviation (SD) of the SF-12 health scores is 10 points, obtaining results that are more than one SD below the average of 50 points is concerning. In comparison, another study (Stuff et al., 2004) with a similar sample size of food insecure adults ( $n = 325$ ) drawn from a population survey in the Lower Mississippi Delta in the United States, obtained mean physical and mental health scores of 45.7 and 46.5, respectively, using the SF-12 scales. The mean physical health score falls within the 47.2 - 42.5 range obtained in the current study; however, the mean mental health scores that we obtained were much lower (35.8 - 39.6, versus 46.5 in the US study), so this difference suggests poorer overall mental health for people who rely on food banks, compared to food insecure people in the general population. This is in consonance with previously cited research (Loopstra & Tarasuk, 2015; Tarasuk et al., 2020), which reported that people who access food banks are not a representative subset of all people who report being food insecure. It is also important to note that the physical health scores did not differ significantly between the four waves of data collection, and that the mental health scores showed a statistically significant, albeit slight improvement.

In this study, we didn't analyze the associations between the various food banking models and physical and mental health; however, due to the increasing prevalence of food banks using novel approaches to providing food assistance, we believe that future research to examine possible associations with health is certainly warranted.

The longitudinal reduction in food insecurity that we observed with food banks integrated in a Community Resource Centre is consistent with the findings of our colleague Enns (Enns, 2020) at the 6-month time point. The initial reduction in the mean food insecurity score was the

most pronounced: 0.79 points out of 10 after six months, compared to a decrease of 0.99 points at twelve months and 1.09 points at eighteen months (all compared to baseline). Although the consecutive decreases in the food insecurity scores seem to indicate further improvements at twelve and eighteen months, the differences were not statistically significant, so larger studies would be needed to confirm if, in fact, there is a continued reduction in food security over time for those who access CRC-type food banks. In any case, the overall reduction in food insecurity that we observed for people who access CRC-type food banks is encouraging because they are also able to access the health and social services offered by CRCs when they visit the Centre for food assistance.

We also found a small but significant difference in food security according to the food distribution model of the food bank. Across all four waves of data collection, the proportions of participants were lower in the moderately and severely food insecure categories if they accessed food banks using the Choice model, compared to participants who visited food banks offering food hampers. Our regression analysis also showed that when food banks used the Choice model, longitudinal food insecurity was 0.53 less (on the 10-point scale) compared to food banks that used the hamper approach. This adds to the findings of the six-month follow-up by Enns (Enns, 2020), who reported a significant increase in fruit and vegetable consumption by people who accessed food banks that employed a Choice model of food distribution. The Choice model may be especially beneficial for those who must avoid certain foods for medical reasons (e.g., lactose intolerance, low sugar diets for diabetics, gluten allergy) or for cultural/religious reasons (e.g., avoiding processed foods that contain animal-based ingredients such as gelatin and broth, which are not considered kosher or halal). Studies have also shown that people prefer to choose food items that they need (based on personal or cultural preferences or dietary requirements) and not have to throw away food they dislike or cannot use if they receive a pre-packed box (Kuhls,

2011; Remley et al., 2010). The benefit of the choice approach may therefore be threefold: lower observed levels of food insecurity when the Choice model is offered, lower levels of waste, and conferring more dignity on the consumer. However, one drawback of the Choice model perceived by people who accessed choice food pantries was longer line-ups (Remley et al., 2010).

Lastly, we believe it is important to consider that the food security level measured in this study is the self-reported level of participants while accessing food banks (whereas most of the reviewed literature provides food insecurity data primarily from people who do not rely on food banks). We found that 63.5% of participants who described themselves as food secure reported that they had visited a food bank two or more times in the previous three months (Table 2.2); since food banks provide only a few days' worth of food, it appears that low levels of food insecurity may be temporarily eased by food banks. On the other hand, a more disconcerting observation is that 47.2% of participants in the severely food insecure category reported this level even after visiting a food bank three or more times in the previous three months. Similarly, 50.4% of participants in the moderately food insecure category reported that level after also visiting food banks three or more times in the previous three months. From these results we can see that food banks may temporarily alleviate food insecurity for some people, whereas many others remain moderately or severely food insecure.

Because household food insecurity is, by definition, due to financial constraints, our findings lend support to the need for public policy changes, such as increases in social support payments or implementing a guaranteed basic income, which several other studies have proposed (Dachner & Tarasuk, 2018; Gundersen et al., 2017; Loopstra et al., 2015; McIntyre et al., 2019). In Canada and other high-income countries, food insecure people with insufficient incomes currently have to rely on a bureaucratic, costly, and stigmatizing 'patchwork' of social assistance

programs administered by different levels of government; because of the shortcomings of existing social safety nets, many researchers have advocated specifically for a simplified guaranteed basic income as a more effective solution (Emery et al., 2013; Koebel & Pohler, 2019; Pereira, 2014; Reed & Lansley, 2016).

**Limitations.** There are several possible limitations to the findings of this study. First, since the analysis was restricted to one Canadian city with a high median household income – \$86,451 per year in Ottawa in 2016, versus \$70,336 across all of Canada (Statistics Canada, 2017) – it may not be representative of other physiographic regions in Canada or other countries.

Furthermore, participation was restricted to a convenience sample of English and French speaking adults; thus, some members of the population may be inadequately represented in the sample. Researchers approached participants to take part in the survey; as a result, there may have been bias due to self-selection of volunteers. Recall, acquiescence response and social desirability biases are all known to influence survey respondents (Holtgraves, 2004; Sjöström & Holst, 2002). Moreover, the data was collected several times over pre-established observation points in this longitudinal study. Hence, we cannot account for circumstances occurring in between those time periods. Finally, although the present study analyzed a diverse group of food banking models, it lacked a comparable sample, specifically one that was food insecure but did not access food banks. Without a control group, we cannot be sure that the results were not due to other factors (i.e., unobserved or unmeasured covariates).

**Strengths.** This study addresses a gap in the evaluation of contemporary food assistance programs by providing current data on the associations between food insecurity and food banking approaches. This study also adds important evidence on the compromised physical and mental health of food insecure people who rely on food banks for assistance. The key strength of this study is that it helps to fill these gaps by providing longitudinal data, collected over 18

months, on patterns of food insecurity over time, and modelling the impact of different food bank approaches on food insecurity scores.

## **Conclusion**

We found significant reductions in food insecurity for people who accessed food banks that offered a Choice model of food distribution and food banks that were integrated within Community Resource Centres. Although our results show a small improvement in food security overall, it is important to note that generally, most participants still reported moderate or severe food insecurity at the end of the eighteen-month study, indicating a clear need for an effective long-term solution such as a guaranteed income to provide financial stability for people facing food insecurity in Canada. One positive finding was that the mean perceived mental health score was slightly higher at the eighteen-month point compared to baseline, possibly due to the small improvement in food security. Since our results found poor self-reported health among the subset of food insecure people who access food banks, additional larger and longitudinal studies that explore and address the unique health concerns of this population are vitally needed.

## **Declarations**

### ***Ethics approval and consent to participate:***

Ethics approval was obtained from the Research Ethics Board of the University of Ottawa. Written informed consent was obtained from all participants prior to taking part in the study. All the methods in this study were carried out in accordance with the relevant guidelines and regulations.

### ***Consent for publication:***

Not applicable

***Availability of data and materials:***

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

***Competing interests:***

The authors declare that they have no competing interests.

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***Authors' contributions:***

Conceptualization (AE, EK); Data curation (RW, AE, AR); Formal analysis (RW); Funding acquisition (AE, EK); Investigation (EK, AE, AR); Methodology (AE, EK, RW); Project administration (EK, AR, AE); Resources (AR, AE); Software (RW); Supervision (EK); Validation (all authors); Visualization (AR, RW); Roles/Writing - original draft (AR, RW); Writing - review & editing (all authors).

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### **Chapter 3: More Food for Thought: A Follow-Up Qualitative Study on Experiences of Food Bank Access and Food Insecurity in Ottawa, Canada (Article 2)**

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#### **Abstract**

##### ***Background***

Despite the widespread proliferation of food banks in high-income countries over the past several decades, there is a paucity of data regarding the long-term experiences of the people who rely on food banks. We were unable to find any other studies with follow-up interviews later than 6 months after baseline.

##### ***Objective***

This study examined the changes in the lived experiences of people who accessed food banks over a period of 18 months.

##### ***Methods***

Semi-structured interviews were conducted with 11 people who accessed food banks in Ottawa, Canada and who had participated in a 6-month study that ended one full year before this follow-up study was done. Transcripts of the interviews were analyzed through a general inductive approach involving repeated readings and coding of relevant segments of text with

NVivo software according to themes that emerged iteratively. Code reports were then used to discuss and reach consensus on a final set of themes.

### ***Results***

Three main themes emerged: (1) chronic physical and mental health issues intersecting with food bank access; (2) psychosocial impact of relying on food banks; and (3) living on a low income and dealing with poverty. Chronic physical and mental health conditions were prevalent among the participants. As well, 10 of the 11 participants in this 18-month follow-up continued to rely on food banks as a regular resource – not as an emergency relief measure – to supplement their nutritional needs. While most of the participants reported that food banks helped them in some way, many shortcomings were also noted regarding food amounts, quality and choice. Overall, there was little change reported since the 6-month follow-up.

### ***Conclusions***

The shortcomings reported by participants can mostly be attributed to the dependence of food banks on charitable donations; thus, despite the commendable work of food bank staff and volunteers, participants described the food assistance as inadequate. Additionally, long-term food bank usage was a common denominator in the lived experiences of all our participants; therefore, our findings reinforce the need for assistance programs that target long-term food insecurity and its underlying causes, to replace or supplement charity-based food bank programs.

**Keywords:** food banks, food insecurity, physical health, mental health, longitudinal study, qualitative research, Canada

## Introduction

According to the UN Universal Declaration of Human Rights, all human beings have the right to adequate food to ensure a standard of living required for the health and well-being of a person and his or her family (Office of the United Nations High Commissioner for Human Rights (OHCHR), 2010), and yet 12% of households in Canada report some level of food insecurity (Tarasuk & Mitchell, 2020). Household food insecurity is defined as the inadequate or insecure access to food due to financial constraints (Tarasuk & Mitchell, 2020). It is an urgent problem in Canada that adversely impacts mental, physical, and social health, and significantly affects our health care system (Gundersen & Ziliak, 2015; Tarasuk et al., 2015; Tarasuk & Mitchell, 2020).

Drawing on data for 103,500 households from Statistics Canada's Community Health Survey conducted in 2017 and 2018, researchers estimated that there were 4.4 million people, including more than 1.2 million children under the age of 18, living in food-insecure households. These results are higher than any previous national estimate, suggesting that the issue of food insecurity is a growing and pervasive public health problem in Canada (Tarasuk & Mitchell, 2020).

Several studies have found that adults living in food-insecure households report poorer physical health and are more at risk of experiencing a wide range of chronic conditions such as heart disease, diabetes, hypertension, and arthritis (Gundersen & Ziliak, 2015; Seligman et al., 2010; Stuff et al., 2004; Tarasuk et al., 2013). A recent literature review (Gundersen & Ziliak, 2015) describes six studies that found an especially strong relationship between food insecurity and poor mental health, with the risk of experiencing depression and anxiety disorder increasing with the severity of food insecurity. The growing problem of food insecurity has largely fallen on charitable organizations such as food banks to deal with (Vlaholias-West et al., 2018). This

reality is reflected in the annual report of the Ottawa Food Bank organization (Ottawa Food Bank (OFB), 2020), which shows that 2.2% of its revenue came from government funding, while 97.8% came from private sector and individual donations.

Sociologist Janet Poppendieck has suggested that charity food relief programs are incapable of handling the rising hunger in their communities in an effective way, and she has attributed the failure of food charity programs in managing rising hunger to the unpredictability that is inherent in a system reliant on charitable donations (Poppendieck, 1999). As such, the amount of food is not sufficient, does not always meet the recipient's preferences, dietary or otherwise, and the nutritional adequacy of the food provided may be questionable. According to Poppendieck, these shortcomings, combined with the charitable nature of the food bank system, all take a toll on human dignity through the constructed identities of "haves" and "have-nots." Canadian food insecurity experts Riches and Tarasuk also wrote that: "Canada's entrenched system of food charity has proven itself to be an ineffective response to household food insecurity and should be understood as part of the problem not the solution to domestic food insecurity" (Riches & Tarasuk, 2014, p. 56).

In several studies of food bank access, there were reports of food received being spoiled, harmful, or unfitting for a person's dietary requirements (Garthwaite et al., 2015; Horst et al., 2014; Loopstra & Tarasuk, 2012). Even though past research has shed light on the limitations of food banks in being able to provide adequate, nutritious, and diet-specific foods for the food-insecure, the number of visits to food banks in Canada rose by 28% between 2008 and 2016 (Food Banks Canada, 2016).

Despite the proliferation of food banks in Canada, little is known about the long-term lived experiences of people who visit these agencies. An extensive 25-year-long study examining program data from a large food bank organization in Vancouver, Canada, found that the majority

of people came for relatively few visits, but that 9% engaged in longer-term or ongoing usage over several years, accounting for 65% of all visits (Black & Seto, 2020). Other studies have also found that the majority of visits to food banks are by people who rely on them on a long-term basis (Depa et al., 2018; Kicinski, 2012). In spite of this, we did not find any previous research that follows up on people's experiences with accessing food banks, conducted more than six months after the initial interview. Paralleling the result of our background search, a scoping review by Middleton et al. (Middleton et al., 2018) analysed 286 articles on food bank access in high-income countries and found only 20 articles that included interviews with food bank clients. Of these 20 articles, only 2 described follow-up interviews, all of which were conducted within 6 weeks of the original interview.

To contribute new evidence to this area of research, our 18-month follow-up study examines the long-term experiences of food insecurity and food bank access of 11 participants who were part of the cohort in a 6-month study that was completed one year earlier by our team (Enns et al., 2020).

## **Methods**

### ***Participants and Setting***

The participants in this study were people who accessed any one of eleven food banks in Ottawa, Ontario, Canada in 2019. All of the participants had been interviewed in a previous phase of the study (Enns et al., 2020), completed in 2018, which examined the experiences of food bank access at two time points: baseline and 6 months. As such, the participants in the current study were familiar with the reasons for doing the research.

There were 29 participants at the original baseline time point and 20 at the 6-month follow-up (i.e., nine lost to attrition at that time). Of the 20 participants that completed the 6-

month interviews, we were able to reach 11 whom we invited to participate in the 18-month follow-up. We were unable to contact the missing participants, by phone or email, despite several attempts.

The sample at our 18-month follow-up was comprised of five female and six male participants who ranged from 25 to 68 years of age, with a mean age of 49. In terms of primary source of income, two participants were receiving old age pensions, one was employed, three were receiving government disability benefits, and five were receiving social assistance benefits.

We conducted the interviews at the baseline, 6-month and 18-month time points in tandem with a quantitative survey-based study of the same eleven food banks in Ottawa, which examined the long-term impacts of various food banking approaches on food insecurity (Enns, 2020; Rizvi et al., 2021). Approximately one in ten of the participants in the quantitative study (n=401) were invited, after completing the baseline survey, to participate in the interviews for this study. Eligibility was not limited by how long the participants had accessed a food bank when they were recruited, so our sample in the current follow-up included people who had accessed a food bank for any length of time of at least 18 months.

### ***Data Collection***

Data collection involved semi-structured interviews conducted with the 11 participants. By referring to the interview guide (Appendix 2) which had been used in the 6-month follow-up (Enns et al., 2020), our interviewers asked the participants to share their experiences; as such, the interview guide provided a ‘rough framework’ which the interviewers used to begin each segment of the interview. The interview guide included questions on whether participants continued to access a food bank or not, changes in life circumstances related to food insecurity and food bank access, as well as changes in the general experiences and interactions at the food bank.

All participants had signed a consent form approved by the Research Ethics Board of the University of Ottawa during the previous 6-month study and were informed at the start of each interview that they could withdraw at any time without consequence. The interviews were conducted over the phone and from a private office by a trained interviewer (AR, female) or by a student (LG, male; two interviews under the direct supervision of AR). The lead investigator of the 6-month follow-up (AE) also instructed AR on specific considerations for interviewing people who access food banks. The average interview duration was approximately 30 minutes. The interviews were audio-recorded with the participants' permission and the interviews were later transcribed verbatim.

Because the number of participants in qualitative studies tends to be small, attrition can be a significant problem for follow-up studies (Hermanowicz, 2013). The risk of attrition is even greater in studies with populations that are considered to be marginalized (McKenzie et al., 1999). By integrating strategies from previous longitudinal studies (Hill et al., 2016; McKenzie et al., 1999), along with feedback from community food bank partners in Ottawa, we applied three means for increasing our retention rate. Firstly, the research purpose was relevant to participants and was clearly communicated. Secondly, we provided an incentive to participants in the form of a \$10 grocery gift card for each interview they took part in. Participants were assured they would still receive the incentive, even if they chose to discontinue the interview. Lastly, we offered interview times that were convenient for the participants, including evenings and weekends.

### ***Data Analysis***

Interviews were transcribed by the paid online service Rev.com, and then the transcript files we received were compared with the audio recordings for accuracy. Thematic analysis of the interview transcripts was conducted using the general inductive approach, as outlined by

Braun and Clarke (Braun & Clarke, 2006) and Thomas (Thomas, 2006). We used the coding grid developed in the 6-month follow up as a starting point and revised it to reflect categories on changes regarding food bank use, quality of food provided, perceived health, etc., as reported by the participants in the interview transcripts. The interviews from each of the eleven participants were independently read by two members of our research team (AR, LG) and then double coded using NVivo software (<https://www.qsrinternational.com>). After repeated discussions and examinations of the independent coding reports, we reached consensus on a final set of themes. Verbatim quotes from the interviews are presented in the Results section below to elucidate the themes.

### ***Reporting***

We used the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Tong et al., 2007) to improve the reporting of this study. The completed checklist is included as Appendix 1.

### **Results**

The participants answered questions on whether their experiences and personal circumstances had changed in the previous six months. Many of the participants reported various changes which were not related to food insecurity or accessing food banks, such as quitting smoking, taking more daily walks, friends moving away, using Facebook more, breaking up with a life partner, and being displaced because of a fire in their building. For questions on changes in experiences with food banks, most of the participants' responses were that there had been little or no change.

The following are the three main themes that emerged on analyzing our data: (1) chronic physical and mental health issues intersecting with food bank access, (2) psychosocial impact of

relying on food banks, and (3) living on a low income and dealing with poverty. We elaborate on the three themes below, using excerpts from the interview transcripts to elucidate each theme.

***Chronic Physical and Mental Health Issues Intersecting with Food Bank Access***

The participants predominantly reported coping with chronic health issues, both mental and physical, in conjunction with varied experiences regarding their access to food banks. The excerpt below describes the experiences of a single mother in her late twenties coping with such difficulties and, in particular, a progression from compromised physical health to episodes of depression and panic attacks:

*“I've been dealing with a lot of fibro(myalgia) pain and more headaches and more digestive issues and pain in my foot and more tiredness... I'm really tired all the time. I have low iron, low vitamin D as well... In the middle of June, like June 14th, 15th, I saw my doctor for mental health. For depression and anxiety. I had an emotional... I got really, what's it called? I was very depressed and I had panic attacks... But once I realized I was in a really, really dark place because it wasn't just one thing that was going on in my life.”*

She goes on to describe how her health issues affected her food bank visits, and the adverse effect on her eating behaviour:

*“I couldn't go to the food bank because I was really sick and then I didn't want anybody to come over to my house because I was very contagious... I guess that's a change, just eating less. I guess not taking care of myself as eating wise as I should. Does that make sense? I don't know.”*

*(Participant # 10, female).*

Another participant, a middle-aged woman with diabetes, described the lack of foods at the food bank for accommodating special diets:

*“My diet is the same because I’ve been diabetic, for like two years. They need to provide more things to the people who have special needs and special diets, which they don’t... I’ve tried to talk to them, (about accommodating a specialized diet for diabetes) and they said, no, what they get is what they get. When I left there, I had peanut butter, they had no brown bread, so I had some peanut butter, I have a pound of beef, and they gave me three cans of lentils. They had no brown rice, I got a cantaloupe, and I think that was just about it. Like I walk over there, I’m like, “Jesus, I wish that I wouldn’t have gone.”*

*(Participant # 8, female)*

The following participant, a woman in her late thirties, also described compounded health problems and expressed the difficulty of managing her health conditions with an income that was insufficient to meet her needs:

*“I don’t have an employment. Like I get ODSP (Ontario Disability Support Program). Because I have a heart condition too. First, I have a heart condition, oh boy. But they fixed that. But then I have another heart condition then they fixed that again! And then two years later I became diabetic, I’m like, holy s\*\*t, how much can one person take?... Oh my god, just now for this month I had to spend \$140 to buy test strips to check my sugar because ODSP only covers 100 tests a year and if you have to test your blood sugar once a day, 100 tests only covers three months. I’m supposed to test my blood once a day but normally I don’t.”*

*(Participant # 1, female).*

A middle-aged male participant shared coping with a chronic heart health issue:

*“...that’s something that’s been ongoing for over a year...it’s called left ventricle hypertrophy. It’s a swollen ventricle due to chronic high blood pressure.”*

*(Participant # 3, male)*

Other participants also reported dealing with chronic physical and mental health concerns:

*“...yeah. I have osteoarthritis.”*

*(Participant # 9, female).*

*“I have an ongoing issue with an eating disorder. When things get stressful, I tend to stop eating. I restrict my food intake. I weigh myself constantly. I weigh my food. I just get really bizarre about it.”*

*(Participant # 5, male).*

*“My mental health has actually been very good relative to even probably even within six months because I've been on a new medication which has helped a lot.”*

*(Participant # 4, female).*

One participant described needing supplemental nutrition drinks (“Ensure”) for sustenance due to a chronic health concern (it is difficult for food banks to offer specialty items like Ensure, which are also expensive to buy):

*“I use the food bank just to get coffee or stuff like that. I haven't eaten solid food in over a year because of Crohn's. I've had it since I was a kid...it's just flared up; it's flared up a lot...all I live on now is Ensure”.*

*(Participant # 7, male).*

### ***Psychosocial Impact of Relying on Food Banks***

This theme relates to the psychosocial aspect of asking for and receiving food assistance from a food bank. Several of the participants' accounts conveyed a tone of resignation wherein reliance on a food bank means accepting a ‘second-class-citizen’ status, as when describing

being offered the food that other people do not want. The following excerpt illustrates one participant's experience with regard to the food received:

*“Basically they can't sell it anymore in the stores because it's all organic stuff. It will only last like a week anyway, not even. We get whatever they can't sell.”*

*(Participant # 2, male).*

There were frequent reports of frustration due to inconsistencies in dealing with the food bank. The following extract describes the perspective of a woman in her late thirties:

*“Frustrating... they say that after your first time you don't have to bring proof of address but then they request proof of address every time apparently. I actually wasn't able to get food last month for that reason ... I don't even bother going on Fridays since they're only open in the morning. It's a zoo and they can be very difficult too.”*

*(Participant # 4, female).*

Another participant reported a similar experience of frustration combined with the uncertainty of food being available when arriving at the food bank. This quote and those above from other participants convey a sense of degradation, of being part of a marginalized social group that is competing for handouts of food:

*“Because when I went, it seem it was like you have to get there early Tuesday morning to get anything at all. If you go Wednesday, Thursday, it's like it's not even worth going. And when you go, it's just like a line up of 40 people or something. By the time they get around to you, oh, everything is gone.”*

*(Participant # 1, female).*

### ***Living on a Low Income and Dealing with Poverty***

While improvements in the food offered at the food bank were noted by a few participants, the majority continued to express the difficulties and challenges associated with trying to stretch their budget to sustain themselves day to day:

*“Well, yes. Compared to last year, this year, I must admit they did have a little bit more fruits and vegetables. Last year, I would go and sometimes, they would have no fruits and vegetables. It will be like maybe one orange and one apple, that's it. This year, they do have a little bit more fruits and vegetables... So, I must give them a little bit of credit that way. “*

*(Participant # 1, female).*

The same participant went on to describe the struggle to stretch the food they receive while living on a low income:

*“They don't give out a lot though, that's the problem. What they give you, it's not enough to even make a good meal. You have to mix it with other things to try to do it, and the problem is, you only can do it twice a month. So, if you're short, it's not much.”*

*(Participant # 1, female).*

The participant above was the only one of the eleven to report visiting a food bank more than once per month, which some food banks in Ottawa allow. Typically, the frequency of visits is limited to once per month, with the aim of providing about three days worth of food for a household.

*“You're only allowed once a month, so that's all I can go is once a month.*

*I've noticed... they had whole chickens, and they were only reserving those for families, and I was a little disappointed in that. ... I have to go out and have somebody live with me just so I can get a little bit of extra food.”*

*(Participant # 11, single male).*

The following participant referred to the food bank as an emergency resource in her answer to how often she had accessed a food bank in the previous six months:

*“Well it's an emergency only food bank, I can only go once a month.”*

*(Participant # 4, female).*

Another participant described her financial hardships, which were aggravated due to illness:

*“I was too sick to go (to the food bank). But when I didn't go, I really drained my bank account more on groceries... So normally when I do our grocery, it costs like \$150 and for someone who gets only like, \$1,400 estimating a month, if you go and do that every two weeks, it really adds up. So when I didn't go to the food bank it really was financially straining.”*

*(Participant # 10, female).*

One older adult had stopped accessing the food bank because he had started to receive his pension:

*“I probably haven't been [to the food bank] I'm trying to remember if I've been there in the last six months. March is when my pension started. Yeah, I used to go regularly, monthly.”*

*(Participant # 6, male).*

## **Discussion**

In Canada, nearly equal proportions of men and women draw on food banks (Black & Seto, 2020). Our sample of participants was similar in this regard, with 5 females and 6 males taking part in our follow-up interviews.

Our findings corroborated those of other studies, that reliance on food banks as a long-term resource to help meet one's basic needs was routine for our participants across different food banks and over time. Food banks were created as emergency short-term responses aimed at helping people cope with financial challenges such as temporary job lay-offs. However, they are habitually utilized as long-term resources by individuals with inadequate income to meet their fundamental household needs (Black & Seto, 2020). One of the participants (#4) in our study voiced this contradiction during her interview: "it's an emergency only food bank, I can only go once a month" – even though, like the other participants, she had relied on the food bank since the start of the 18-month study.

The prevalence of long-term food bank access by the interview participants was also consistent with the results of our parallel quantitative study, which found that 63.8% of the 271 participants at the 18-month endpoint reported either moderate or severe food insecurity, compared to 73.0% of the 401 participants at baseline (Rizvi et al., 2021). The serious extent of food insecurity after 18 months of receiving food assistance helps to understand the need to continue to rely on food banks, as was the case for most of our interview participants.

Similarities as well as differences can be noted in comparing the current 18-month follow-up study to the previous 6-month follow-up. For example, at the 6-month time point, participants reported the associated stress of living with a low-income and not being able to afford a cup of coffee, bus fare, and struggling to cope with restricted social/recreational activities due to inadequate income, which was corroborated in our findings at the 18-month time point. We found evidence of participants subsisting with the hardships linked to a limited income, especially when there were children in the home. There were several instances reported of mothers forfeiting meals or struggling to stretch the food received from the food bank to make

it go further. This is consistent with other findings (Hamelin et al., 2002) that show that mothers in food-insecure households often forgo their meals so that their children can have more.

In addition to the stress of financial constraints, several of the participants described negative psychosocial impacts of having to rely on food banks, which people in food secure populations would not encounter. Frustration was often reported, resulting from long wait times, inconsistent proof-of-identity requirements, unavailability of diet-specific food items, and food running out before the participant's turn came up. Our previous findings at the 6-month time point described instances of people acquiring food that either did not meet their dietary needs or had passed the best-before date (Enns et al., 2020). Our results at the 18-month follow-up supported this finding with participant accounts of receiving food that was close to the best-before date which had to be consumed the same day. Perhaps even more serious were the participants' perceptions that they received unwanted food – and even to get the unwanted food, the recipients had to compete by showing up at the food bank early. Van der Horst et al. noted that the “compulsory gratitude” can also feel degrading, even when recipients are able to obtain food they need (Horst et al., 2014). Thus, despite all the valuable and commendable work that food banks accomplish, the people who need to rely on them over the long-term may come to feel that they belong to a social class that is less deserving than the general population.

Paralleling the results of the 6-month time point of our previous study, in which 19 out of 20 participants were continuing to rely on food banks to augment their limited income, our current results found 10 out of 11 participants in a similar situation. One difference noteworthy in our results at the 18-month time point was a slight improvement in the amounts of fruits and vegetables offered at some food banks, although the frustrations associated with long line-ups and protracted wait times were reported at both six months and eighteen months.

Since prior research on the lived experiences of regular and long-term use of food banks is scarce, our findings contribute new evidence attesting to the struggles that people face in trying to augment their food supply on a limited budget. A 25-year study conducted in Vancouver, Canada (Black & Seto, 2020) did examine demographic and physical health factors that were correlated with extended food bank reliance, but that study did not look at the lived experiences of the food bank clients. One could describe the Vancouver study as a look “from the outside-in” whereas our study gives a long-term perspective on how food banks work, as seen through the eyes of the people who access food banks. The participants’ unique personal accounts provide poignant glimpses into their experiences of food insecurity and accessing food banks while having to also cope with the presence of chronic health conditions such as diabetes, fibromyalgia, heart disease, osteoarthritis, depression, and anxiety.

Taken together, our findings revealed a common theme of recurring and persistent food bank access at the 18-month time point, with all participants reporting chronic use except one, who had begun to receive his pension. A comparison of the interviews from the 6-month follow-up with this one demonstrates negligible change in food insecurity and food bank access, with little to no reported improvements in health.

Our findings are consistent with previous evidence suggesting that people who rely on food banks have typically experienced prolonged poverty, low incomes, and adverse life events (Black & Seto, 2020), as well as chronic health issues such as diabetes and heart disease (Gundersen & Ziliak, 2015; Tarasuk et al., 2015; Tarasuk & Mitchell, 2020). In our 18-month follow-up, all eleven participants reported long-standing physical and/or mental health conditions.

As defined above, food insecurity is due to financial constraints, and income has been found to be a strong determinant of health and well-being (McIntyre et al., 2016; Tarasuk &

Mitchell, 2020). Furthermore, health problems due to hunger – an extreme outcome of food insecurity – can develop early in life, as shown by a 10-year study which found that any experiences of hunger in childhood were associated with poorer general health at the endpoint of the study, whereas repeated experiences of hunger were associated with increased risk of chronic diseases (Kirkpatrick et al., 2010). Chronic health problems can also worsen over time among people who experience food insecurity if they are not able to afford the therapeutic diets and medications that are prescribed for their conditions (PROOF, n.d.). A large 4-year study found that severe maternal depression increased the likelihood of household food insecurity by 69% (Noonan et al., 2016). Bi-directional relationships between food insecurity and health may exist and further research is needed to elucidate them. For example, poor health could preclude obtaining or retaining well-paid employment and the cost of treatment could be financially devastating, while conversely, food insecurity could lead to stress-induced compromised health.

The onset of chronic illnesses early in life and the limited ability to self-manage these conditions due to factors related to poverty are likely significant factors in the finding that public healthcare expenses for a severely food-insecure adult in Ontario (Canada's largest province) are, on average, more than double those of a food secure adult (Tarasuk & Mitchell, 2020). Tarasuk and colleagues found that, compared to food-secure households, those facing moderate food insecurity incurred 49% higher health care costs, while those who were severely food-insecure incurred 121% higher health care costs (Tarasuk et al., 2015). Prior research has suggested that income support programs may be linked with improved health and reduced healthcare costs. For example, a large study in Canada found significant improvements in the self-reported physical and mental health of low-income Canadians after the age of 65 when they started to receive old age pensions (Emery et al., 2013). A study conducted in Manitoba found

that the number of hospitalizations declined by 8.5% after a five-year guaranteed annual income experiment (MINCOME) (Forget, 2013).

According to the HungerCount 2018 report from Food Banks Canada, people who report social assistance or disability-related benefits as their main source of income account for 59% of population who rely on food banks (Food Banks Canada, 2019). The Food Banks Canada report also describes “a cycle of poverty that is extremely difficult to escape” among people who receive social assistance as their main source of income (p. 21), a problem which was corroborated in our original 6-month study where participants described having to live on a monthly cycle (Enns et al., 2020). A mixed-methods study conducted in Vancouver using surveys and focus groups (Holmes et al., 2018) also found that financial constraints related to insufficient income, when receiving social assistance benefits as the primary source of income, combined with rising housing costs and chronic health issues, reinforced the participants’ perception of food banks as a resource they would need to rely on over the long term.

Based on the results of this 18-month follow-up study and those of other larger studies, it is evident that the current systems of food banks cannot provide a reliable and adequate supply of food to meet the long-term nutritional needs of food-insecure Canadians. This finding highlights the need for programs that target long-term food insecurity and its underlying causes, including poverty.

### ***Limitations***

The present study was restricted to people who accessed food banks in Ottawa, Ontario, Canada. As a result, the findings may not be generalizable to people who access food banks in other geographic regions.

Because we were only able to contact 11 of the original 29 participants from the baseline point of our previous study, the small sample size in this 18-month follow-up may limit the

completeness of our findings; that is, other important themes may have emerged if more participants had been interviewed. As such, the small sample size prevented checking for data saturation (when additional interviews no longer yield substantial new information).

The high rate of attrition in itself may suggest a high degree of housing instability among people who rely on food banks, and this potentially raises further concerns for their well-being. Further research on food insecurity and housing stability may be very helpful.

## **Conclusions**

This study contributes contemporary evidence on the experiences of people who accessed food banks over time, through the qualitative analysis of interviews that were conducted in the 18-month follow-up. Our findings support those of previous studies, that people rely on food banks as a long-term and regular resource to try to meet their basic needs, and that these people often struggle with chronic health issues. The observed lack of change in this 18-month follow-up indicates a serious problem, and it provides further evidence that food banks are not able to alleviate chronic food insecurity.

Although the number of participants in our study is small, the longitudinal nature strives to convey the unique and personal perspectives of the participants, as they try to live their lives and carry on, despite the uncertainty that is the current state of the social safety net for the food insecure. The results of our study suggest that programs to address long-term food insecurity and its underlying causes are urgently needed to effectively mitigate food insecurity in Canada.

## **Declarations**

### ***Ethics approval and consent to participate***

Ethics approval for this study was granted by the University of Ottawa Office of Research Ethics and Integrity (file number: H-09-17-112). All the methods in this study were carried out in accordance with relevant guidelines and regulations. Written informed consent was obtained from all participants prior to taking part in the study.

### ***Consent for publication***

Not applicable

### ***Availability of data and materials***

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### ***Competing interests***

The authors declare that they have no competing interests.

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### ***Authors' contributions***

AE and EK designed the research; AR and LG conducted the research and analyzed the data; AR wrote the paper and had primary responsibility for the final content; all authors read and approved the final manuscript.

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### *Author's information*

The first author (AR) is currently a PhD candidate who is conducting studies on food insecurity, poverty and guaranteed basic income for her doctoral dissertation. AR previously worked for many years as a counseling psychologist (M.Ed.), frequently with individuals from marginalized populations.

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**Chapter 4: Effects of guaranteed basic income interventions on poverty-related outcomes in developed high-income countries: a systematic review (Article 3)**

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**Abstract**

***Background***

High-income countries offer social assistance (welfare) programs to help alleviate poverty for people with little or no income. These programs have become increasingly conditional and stringent in recent decades based on the premise that transitioning people from government support to paid work will improve their circumstances. However, many people end up with low-paying and precarious jobs that may cause more poverty because they lose benefits such as housing subsidies and health and dental insurance, while incurring job-related expenses. Conditional assistance programs are also expensive to administer and cause stigma. A

guaranteed basic income (GBI) has been proposed as a more effective approach for alleviating poverty, and several experiments have been conducted in high-income countries to investigate whether GBI leads to improved outcomes compared to existing social programs.

### ***Objectives***

The aim of this review was to conduct a synthesis of quantitative evidence on GBI interventions in high-income countries, to compare the effectiveness of various types of GBI versus existing social assistance programs, in improving poverty-related outcomes.

### ***Search methods***

Searches of 16 academic databases were conducted in May 2022, using both keywords and database-specific controlled vocabulary, without limits or restrictions on language or date. Sources of grey literature (conference, governmental, and institutional websites) were searched in September 2022. We also searched reference lists of review articles, citations of included articles, and tables of contents of relevant journals in September 2022. Hand searching for recent publications was conducted until December 2022.

### ***Selection criteria***

We included all quantitative study designs except cross-sectional (at one timepoint), with or without control groups. We included studies in high income countries with any population and with interventions meeting our criteria for GBI: unconditional, with regular payments in cash (not in-kind) that were fixed or predictable in amount. Although two primary outcomes of interest were selected *a priori* (food insecurity, and poverty level assessed using official, national, or international measures), we did not screen studies on the basis of reported outcomes because it was not possible to define all potentially relevant poverty-related outcomes in advance.

### ***Data collection and analysis***

We followed the Campbell Collaboration conduct and reporting guidelines to ensure a rigorous methodology. Risk of bias was assessed across seven domains: confounding, selection, attrition, motivation, implementation, measurement, and analysis/reporting. We conducted meta-analyses where results could be combined; otherwise, we presented the results in tables. We reported effect estimates as standard mean differences (SMDs) if the included studies reported them or provided sufficient data for us to calculate them. To compare the effects of different types of interventions, we developed a GBI typology based on the characteristics of experimental interventions as well as theoretical conceptualizations of GBI. Eligible poverty-related outcomes were classified into categories and sub-categories, to facilitate the synthesis of the individual findings. Because most of the included studies analyzed experiments conducted by other researchers, it was necessary to divide our analysis according to the 'experiment' stage (i.e., design, recruitment, intervention, and data collection) and the 'study' stage (data analysis and reporting of results).

### ***Main results***

Our searches yielded 24,476 records from databases and 80 from other sources. After screening by title and abstract, the full texts of 294 potentially eligible articles were retrieved and screened, resulting in 27 included studies on 10 experiments. The total number of participants was unknown because some of the studies did not report exact sample sizes. Of the studies that did, the smallest had 138 participants and the largest had 8,019. Eight of the 10 experiments were RCTs, one included both an RCT site and a 'saturation' site, and one used a repeated cross-sectional design. The control groups in all 10 experiments received 'usual care' (i.e., no GBI intervention). The risk of bias assessments found 'some concerns' for at least one domain in all 27 studies and 'high risk' for at least one domain in 25 studies. The risk of bias was assessed as

high in 21 studies due to attrition and in 22 studies due to analysis and reporting bias. To compare the interventions, we developed a classification framework of five GBI types, four of which were implemented in the experiments, and one that is used in new experiments now underway. The included studies reported 176 poverty-related outcomes, including one pre-defined primary outcome: food insecurity. The second primary outcome (poverty level assessed using official, national, or international measures) was not reported in any of the included studies. We classified the reported outcomes into seven categories: food insecurity (as a category), economic/material, physical health, psychological/mental health, social, educational, and individual choice/agency. Food insecurity was reported in two studies, both showing improvements (SMD = -0.57, 95% CI: -0.65 to -0.49, and SMD = -0.41, 95% CI: -0.57 to -0.26) which were not pooled because of different populations, interventions, and study designs. We conducted meta-analyses on four secondary outcomes that were reported in more than one study: subjective financial well-being, self-rated overall physical health, self-rated life satisfaction, and self-rated mental distress. Improvements were reported except for overall physical health or if the intervention was similar to existing social assistance. The results for the remaining 170 outcomes, each reported in only one study, were summarized in tables by category and subcategory. Adverse effects were reported in some studies, but only for subgroups of participants, and not consistently, so these results may have been due to chance.

### ***Authors' conclusions***

The results of the included studies were difficult to synthesize because of the heterogeneity in the reported outcomes. Partly this was due to poverty being multidimensional, so outcomes covered various aspects of life (economic, social, psychological, educational, agency, mental and physical health). Evidence from future studies would be easier to assess if outcomes were measured using more common, validated instruments. Based on the outcomes we

could examine across studies, a supplemental type of GBI (provided along with existing programs) may be effective in alleviating poverty-related outcomes. This approach may also be safer than a wholesale reform of existing social assistance approaches, which could have unintended consequences.

### **Plain language summary**

*Caption: Limited evidence that a guaranteed basic income improves poverty-related outcomes compared to existing conditional social assistance*

Numerous types of guaranteed basic income (GBI) have been tested in high-income countries, yielding limited evidence for each type. Full GBI with gradual withdrawal of benefits (as other income increases) may reduce food insecurity and increase the time youths stay in school after the compulsory age. Supplemental GBI (paid along with existing income assistance programs) may reduce mental distress. GBI with benefit amounts that are larger than social assistance benefits may improve life satisfaction and subjective financial well-being. The evidence for any type of GBI pertaining to overall health is inconclusive.

### ***What is this review about?***

Existing social assistance programs are complex and costly to administer. Recent reforms intended to alleviate poverty by transitioning benefit recipients to paid work through strict requirements and sanctions have not been successful and have sometimes exacerbated poverty and stigma. GBI has been proposed as a simpler solution, but opponents argue that it would be unaffordable (due to benefits being given to more people) and might result in increased poverty for people who are presently eligible for more than one program.

This review examined experiments intended to predict the impacts of a full-scale GBI program. We looked at interventions that met our criteria for GBI: unconditional (e.g., not

requiring job seeking), paid in cash (e.g., not food vouchers), as well as paid regularly and in fixed or predictable amounts.

Because social assistance programs are intended to alleviate poverty, we looked at any poverty-related outcomes that the GBI experiments examined, including food insecurity, health (mental and physical), and financial, educational, and social impacts.

**What is the aim of this review?**

This Campbell systematic review synthesizes the findings of twenty-seven studies from high-income countries on the effects of guaranteed basic income interventions on poverty-related outcomes, compared to existing social assistance (welfare) programs.

***What studies are included?***

This review summarizes evidence from 27 studies that analyzed data from 10 experiments carried out between 1968 and 2020 that aimed to explore how GBI would impact people with low incomes. Five experiments took place in the US, two were in Canada, and the rest were in Barcelona (Spain), Finland, and the Netherlands. Nine of the experiments randomly assigned participants to either receive GBI or not (control group) so that observed effects could be attributed to receiving GBI. However, the experiments and the related studies had several other methodological weaknesses, which reduced the quality of the evidence.

***What are the main findings of this review?***

Our analysis of the ten GBI experiments identified four distinct types of GBI that were tested, which formed a framework to categorize and synthesize the findings in the examined

studies. A fifth type of GBI, which has been implemented in new experiments that are underway, was also included in the framework to assist in future analyses.

The included studies examine a total of 176 poverty-related outcome variables. Combining quantitative results across studies is only possible if the same variable is being measured. Therefore, most of the findings are synthesized by sorting them according to seven outcome categories and 34 subcategories.

Food insecurity, self-rated mental distress, and post-mandatory school enrollment may be significantly improved when GBI is provided. The evidence on subjective financial well-being and self-rated life satisfaction appears mixed; however, GBI with more generous benefits than existing social assistance appears to yield beneficial results for both of these outcomes.

A supplemental type of GBI, provided in addition to existing social assistance benefits, appears to improve subjective financial well-being, self-rated life satisfaction, and self-rated mental distress.

Receipt of a full GBI (i.e., replacing social assistance benefits) does not appear to improve self-rated overall health.

### ***What are the implications for research and policy?***

Although the details of how a full-scale GBI would be implemented have been discussed and debated, the empirical evidence from GBI experiments has been previously assessed as if GBI were a singular type of intervention. The typology developed for this review may assist in the evaluation and synthesis of GBI studies in the future, especially since numerous new experiments are underway.

The main obstacle to a more complete synthesis in this review was the large number of different outcome measures that studies used. In part, this is because income-support interventions affect many aspects of life (social, economic, health, etc.); however, it may help if

researchers use standard validated measures in future studies. At the same time, very broad outcome measures (e.g., general health) may obscure more specific impacts (e.g., on hypertension), so a compromise between general and granular outcomes may provide stronger evidence.

For implementing a full-scale GBI program, a supplemental GBI may be most effective, as well as more prudent, to avoid possible unintended consequences of a broader reform of existing social assistance.

***How up-to-date is this review?***

Searches for eligible studies were conducted until December 2022. Studies published later would likely include data collected during the COVID-19 pandemic, so they would not be within the scope of this review (on interventions conducted to inform permanent income assistance policies).

## Background

### *The problem, condition or issue*

**Poverty in high-income countries.** Although the concept of poverty in high-income countries seems like a contradiction in terms, there are nonetheless many people in these countries who are unable to afford basic needs such as adequate and nutritious food. Many of these people rely on social assistance benefits and food banks, as well as housing, heating, and electricity subsidies to make ends meet. The seeming incongruity of poverty existing in wealthy countries can be explained in part by the definition of a high-income country: one that has a gross national income (GNI) per capita of US\$13,846 or more (World Bank 2023). Because this criterion is only an average for each country, it does not provide any information on the distribution of the income within the population or indicate how many of its citizens are unable to afford a basic standard of living.

Although it is expected that some people in the free-market economies of high-income countries will earn more money than others, income inequality has increased in almost all developed (industrially advanced) countries since 1990 (United Nations 2020). In the U.S., the share of national aggregate income held by low-income households fell slightly from 10% to 9% between 1970 and 2018, while the share held by high-income households over the same time increased from 29% to 48% (Horowitz et al., 2020). As well, the proportion of the population in the middle-income class (having household incomes between 75%-200% of the national median) has declined since the mid-1980s in most developed countries, while the size of the lower-income class (below 75% of the national median household income) has grown in most (OECD 2019). In contrast, due to strong economic growth in industrially developing countries in the last two decades, the size of the middle class in these countries has nearly doubled or tripled, depending on the measure used (Versace 2021). One factor in these diverging trends between

higher-income and lower-income countries is the outsourcing of manufacturing by developed countries in recent decades, combined with technological advancement that has displaced routine-based jobs as well as increasing computing power and artificial intelligence which is also placing non-routine jobs at risk (OECD 2021).

According to the International Labour Organization (ILO), 22% of people in developed countries (more than 300 million) were considered poor in 2012, with an income of less than 60% of the national median – and since then, various indicators have shown poverty rates to be either unchanged or, in the case of some countries (e.g., Greece, Italy, Portugal), trending higher after the 2008 global financial crisis (ILO 2016, OECD 2022). Similarly, the poverty threshold of the Organisation for Economic Co-operation and Development (OECD), set at 50% of the national household median income, indicates that poverty rates in developed countries have remained fairly stable between 2008 and 2019, ranging in 2019 from 5.6% in Czechia (Czech Republic) to 18% in the United States (OECD 2023). The OECD data also show the poverty rate for children (0-17 years old) in the United States and Spain to be the highest among developed countries in 2019, at 21%. (Although poverty rates are also available for 2020 and later, we are not including them for comparison because of the economic instability caused by the recent pandemic and the various temporary relief measures that were implemented in each country.)

It is important to note that the poverty rates cited above draw on measures of relative poverty (based on national median incomes) and not absolute poverty, which refers to the extent of material deprivation and the lack of access to food, clean water, health services, and basic education (Peer 2023). The implications of relative poverty can vary from setting to setting. For example, if one country's median income is €30,000 and another's is €40,000, then using a poverty threshold of 50% of the median income would mean that people with incomes between €15,000 and €20,000 would be considered poor in one country but not in the other. Relative

poverty measures can also be misleading if economic conditions change in the short term (Sarlio 2018). For example, if a stock market crash resulted in lower incomes for wealthy people in a country, the national median income would decline, resulting in fewer people being considered as poor without any change in their financial situations.

Relative poverty rates can provide a useful indicator of income inequality within a country (for example, identifying what proportion of people have incomes in the lowest quartile), but they do not provide any insight into the extent or severity of poverty that people experience. It is imperative to recognize this limitation when assessing the effectiveness of policies, programs, or interventions intended to reduce poverty, considering that basic material needs such as food and shelter are unmet – either temporarily or chronically – for many people in high-income countries. Because homelessness involves complex underlying factors besides not being able to afford housing, such as substance use/addiction, intimate partner violence, and mental illness, this experience of poverty is outside the scope of this review, but has been addressed in others (for example, Aubry 2020; Moledina et al., 2021; Nilsson 2019). Inadequate access to food, on the other hand, is directly related to people's financial circumstances in high-income countries, as reflected in commonly used definitions of food insecurity: “a lack of available financial resources for food at the household level” (Hunger and Health 2022), “[not] having physical and economic access to sufficient healthy food at all times” (UK Government, 2021), and “the inadequate or insecure access to food because of financial constraints” (Tarasuk and Mitchell 2020).

The primary response to food poverty in high-income countries in recent decades has been a proliferation of food banks; however, because of their dependence on charitable donations, food banks are limited in their capacity to alleviate food insecurity (Loopstra 2018). The increasing use of food banks in high-income countries is an important indicator in relation to

poverty because the people who rely on food banks for assistance are typically in the most food-insecure categories (moderately or severely food-insecure) and have lower incomes than food-insecure people who do not rely on food banks (Tarasuk 2020).

**Policies and programs for reducing poverty.** Social justice advocates have long asserted that poverty reduction is a moral obligation of the state which can be achieved by a fairer distribution of wealth (Barder 2009; Standing 2019). Although various types of support have been provided by the state to people in poverty since ancient times, the modern concept of social welfare emerged in the late 19th century in Germany under Chancellor von Bismarck, based on the precept that people facing poverty and distress should receive assistance from the state, not as a matter of charity but as a right (Rose 1985). Other high-income countries followed suit during the 20th century, implementing social assistance programs to alleviate poverty after the Great Depression (Trattner 2007). In the United Kingdom during the Second World War, economist Sir William Beveridge wrote a report for the government which called for a ‘revolution’ in the direction of Britain’s welfare state and laid out a comprehensive set of social assistance programs, including child benefits, publicly funded healthcare, and funeral allowances. The Beveridge Report expanded on programs introduced by Lloyd George and Churchill three decades earlier and provided the blueprint for modern welfare in the United Kingdom (Day 2017; Wheeler 2015). Similarly, the Marsh Report of 1943 provided the foundation for the current social security system in Canada, by proposing measures similar to Beveridge’s (a mentor of Marsh) and adding elements such as an employment program and health care insurance (Policy Options 2004).

The cost of social assistance programs in high-income countries is between 12% and 31% of the gross domestic product (GDP), depending on the country (OECD 2020). The generosity of

social assistance also varies over time, with cutbacks being common during economic recessions due to politicians being pressured to support workers not 'shirkers' (Romano 2015).

Social welfare programs were found to reduce both relative and absolute poverty in most high-income countries between 1960 and 1991, particularly in those with more generous programs (Kenworthy 1999). Since then, however, welfare reforms – often called 'workfare' because of their emphasis on transitioning social assistance recipients into the workforce – have been blamed by critics for reversing the poverty reduction trend by cutting benefits to the unemployed, including single mothers, and requiring them to accept precarious, low-paying jobs (Carey and Bell 2020; Widerquist 2013). The increased conditionality of workfare may also result in additional stigma and shame for recipients who either remain unemployed, or those who are skilled or educated and placed in low-skill, low-paying jobs (Carey and Bell 2020; Widerquist 2013). Sanctions in the form of benefit cuts and interruptions are intended to increase compliance with the conditions of workfare programs (e.g., accepting any type of available work); however, a recent review of 94 studies suggests that these sanctions can have detrimental effects on mental and physical health, debt, material hardship, and financial stress (Pattaro 2022).

Because social assistance programs rely on a minimum income threshold to determine eligibility, transitioning to a low-paying job with an income slightly above the threshold can result in losing the benefit. Some programs include an earnings allowance (e.g., for income from a part-time job) which raises the eligibility threshold; however, this allowance is usually a modest amount (e.g., \$200 per month in Ontario, Canada; Government of Ontario, 2022) or is conditional (e.g., having a dependent child in the UK; UK Government, 2023). Low-paid work may also mean losing in-kind benefits such as a rent subsidy and dental care, so a person's net income may end up being even lower than the amount provided by social assistance (Wolfson 2018).

A distinguishing feature of social assistance in most high-income countries is the availability of various programs, offered by different levels of government (federal, state/provincial, municipal) and targeted at specific groups (e.g., people with disabilities, women with infant children) and for specific needs (e.g., money for food or rent). This approach has been criticized as being a patchwork of programs that are confusing in terms of understanding eligibility criteria, and which fail to provide some people with a subsistence-level income (Kobel and Pohler 2019; Wolfson 2018). The complexity of the programs and uncertainty regarding eligibility also translates into high levels of non-uptake, which results in many people missing out on benefits that they are eligible to receive. Although non-uptake results in short-term savings for the government, it may result in more costly downstream effects if it prevents people from affording early medical treatment or paying for a better education for their children (Van Mechelen and Janssens 2017).

The United Kingdom introduced a welfare reform called Universal Credit (UC) in 2012, which consolidates six previously separate programs (Winchester 2021). To be eligible for UC, most recipients who are unemployed (except those with infant children) must seek work or take training courses, and noncompliance such as missing an appointment with a work coach can lead to sanctions (UK Government 2014). Some studies also show that the reforms of UC have led to an increase in poverty for single mothers, due to the loss of provisions offered by the replaced programs, as well as large reductions in time available to care for children due to intensive job-seeking requirements (Carey and Bell 2020).

One type of supplementary social assistance offered in many high-income countries is in the form of refundable (or payable) tax credits, which provide cash benefits to eligible people with low incomes who file income tax returns. However, this form of income supplement has been criticized as being insufficient, especially for people with low incomes and without children

(Koebel and Pohler 2019). Also, refundable/payable tax credits only reach those who file income tax returns, and the rate of non-filing is as high as 20% among people with very low incomes (Robson and Schwartz 2020).

**Universal basic income.** Universal basic income (UBI) has been proposed as a potentially effective way to alleviate poverty (Hasdell 2020) and to replace the current assortment of social assistance programs in high-income countries, administered by different levels of government, which have been described as bureaucratic, costly, and stigmatizing (Koebel and Pohler 2019; Reed and Lansley 2016). UBI is “an income paid by a political community to all its members on an individual basis, without means test or work requirement” (Van Parijs 2004, p. 8). More recently, additional dimensions of UBI have been specified: it is paid at regular intervals and as cash payments which recipients can spend in any way they choose (BIEN 2020). The amount of the UBI payment should also be stable and predictable (Standing 2021). These payments should provide enough funds to meet basic needs, may or may not be phased out as earnings increase, and be available to a large portion of the population, rather than targeted to a particular group (Hoynes and Rothstein 2019). Universality is intended to promote social cohesion; a universal guaranteed annual income becomes a shared social experience rather than an individual benefit (Forget, 2011). Advocates of UBI programs have suggested that they are a just and economically efficient means of achieving the core objectives of social security: redistributing income, alleviating poverty, and managing risk (Martinelli, 2017).

Proponents of UBI have criticized the reformed welfare programs of the past three decades as being fiscally unsustainable, overly intrusive and inhibiting the agency of benefit recipients (Orrell 2021). In terms of public opinion, a study in the United Kingdom and the

United States found that the two main reasons cited in support of UBI were simplicity and efficiency of administration, and the reduction of stress and anxiety (Nettle 2021).

Other important implications for UBI pertain to inequalities across socioeconomic status, race, ethnicity, and gender. Stressors such as financial difficulties, caring for disabled children or parents, and abusive relationships at work or at home have damaging effects on mental and physical health, and these effects disproportionately impact women, racial/ethnic minorities and people with low incomes (Thoits 2010).

For women, UBI paid on an individual basis could potentially address several areas of concern. Firstly, UBI would provide an income for women who perform work outside the formal labour market, such as caring for children and doing volunteer work, as well as for those who have personal care jobs which usually do not pay well. An individual-level UBI would also reduce the financial dependency of spouses in abusive households, who currently are not eligible for social assistance if their spouse earns an income above the eligibility threshold (Bidadanure 2018).

Poverty rates in high-income countries are disproportionately high for Black and Indigenous people as well as for other racial and ethnic minorities, often resulting from involuntary unemployment due to discrimination and lack of opportunities. UBI has been proposed since the 1960s by Martin Luther King, Jr., the Black Panther Party, and other advocates as a way to alleviate poverty due to systemic racism and reduce income inequality along racial lines (Bidadanure 2019).

UBI is currently receiving renewed attention due to rising income inequality and the changing nature of work due to automation and reductions in the quantity and quality of jobs (Gentilini 2020; Hasdell 2020). More recently, the economic disruptions brought about by the COVID-19 pandemic have further prompted policy discussions on full- scale UBI programs. On

the other hand, the concept of UBI is also controversial and has been criticized for potentially disincentivizing work and for being extremely costly, to the point that it could result in cuts to healthcare and education (Centre for Social Justice 2018; Hoynes and Rothstein 2019).

**Measuring poverty.** Regardless of the type of poverty reduction approach that could be implemented, a major challenge is evaluating the effectiveness of the approach. This is because a standardized method does not exist for measuring poverty. Indeed, there has been considerable debate over which poverty indicators are most accurate and reliable (Cutillo 2020; Meyer and Sullivan 2012). Official poverty measures have traditionally been based on income, setting some minimum threshold as the poverty line, while some newer official measures factor in the cost of living, or at least the cost of basic needs (Cutillo 2020; Guio 2016; Meyer and Sullivan 2012). Simple income-based measures are still commonly used and have been criticized as being outdated and that they measure income inequality, not poverty (Gupta and Theoharis 2020; Konle-Seidl 2021). The OECD, for example, defines the poverty line as “half the median household income of the total population” in each country (OECD 2021). Because of the arbitrary thresholds of such measures, millions of people slightly above the poverty line may live precariously – “just a \$400 emergency away from poverty” (Gupta and Theoharis 2020).

Consumption-based measures, which use surveys to assess what goods and services individuals or households consume, have been proposed as a more accurate indicator of poverty. A comparison of various poverty measures in Europe found that consumption-based measures versus income-based measures identified different groups as being poor, compared to income-based measures, and that income had a low correlation with severe material deprivation (Cutillo 2020). Similarly, a comparison of poverty measures in the United States, including the official poverty measure (OPM), found that a consumption-based measure was more accurate in identifying people who were facing financial hardship – that is, low consumption was a better

indicator than low income (Meyer and Sullivan 2012). Consumption-based measures can also identify those with incomes above the official poverty line who spend a large amount on health-related expenses, which may cause difficulty in affording food and rent (Sarabia 2016).

The inaccuracy of income-based poverty measures, even when the cost of living is factored in, can be demonstrated by non-monetary indicators of poverty. For example, in Canada the official poverty measure, the Market Basket Measure (MBM), indicates that the percentage of Canadians living below the poverty line decreased considerably, from 15.0% in 2012 to 10.1% in 2019. Over almost the same period, however, the prevalence of food insecurity increased slightly, from 8.3% of households in 2011-2012 to 8.7% in 2017-2018 (Statistics Canada 2021). As well, the number of people aged 65 and older who visited food banks because they did not have enough money for food increased by 29.8% between 2016 and 2019 (Food Banks Canada 2019). Official poverty measures also may not capture the impacts of food poverty on children, for whom food insecurity is not only associated with hunger and inadequate nutrition, but also with social, developmental and health impacts that may persist into adulthood (Ramsey 2011; Thomas 2019).

Food insecurity has been proposed as a more accurate and sensitive indicator of poverty than measures based on income and estimates of the cost of living (Loopstra and Tarasuk 2013; Power 2016). Loopstra and Tarasuk observed a linear relationship between the severity of food insecurity and the odds of experiencing hardships such as not being able to pay rent and bills on time.

To examine the relationships between various types of material deprivation, Toppenberg (2017) constructed regression models using data from the US Census Bureau's 2015 Current Population Survey Food Security Supplement, and found that compromised health, education, standard of living, and housing were all better predictors of food insecurity than low income.

Recently, there has been increasing attention in the social sciences and policy research to the multidimensional nature of poverty, which includes income poverty and material deprivation, as well as the psychological dimension of subjective financial stress (Schenck-Fontaine and Panico 2019). The experience of poverty also includes other less tangible aspects which income and consumption measures are not able to capture, such as deficits in the areas of “voice, human security, isolation, dignity, lack of time, and subjective wellbeing” (Poverty Analysis Discussion Group 2012, p. 5).

Interestingly, multidimensional poverty indices have been adopted in many developing countries as official poverty measures, incorporating the dimensions mentioned above, as well as: basic services, environment, personal safety from violence, and social inclusion (ITWG 2021). Non-governmental bodies such as the United Nations Development Programme (UNDP) and the International Fund for Agricultural Development (IFAD) have also developed multidimensional poverty measures, as has the United Nations Children's Fund (UNICEF) to assess poverty of children (SDSN 2019).

The European Union (EU) adopted a new official poverty measure in 2010 which is described as multidimensional (SDSN 2019; Whelan 2014); however, it only includes three indicators: relative income (60% of the national median), employment, and material deprivation.

In this review, we examine basic income interventions for reducing poverty, assessed using traditional income- based poverty measures as well as alternative and novel measures – based on food insecurity, consumption, material deprivation, subjective financial stress, and other physical, social, and psychological dimensions of poverty that are reported in studies – to examine and compare the effectiveness of different variants of a guaranteed basic income.

**The intervention.** A truly universal basic income policy has never been implemented in high-income countries (Gentilini et al., 2020; Gibson et al., 2020). Thus, our review examines

basic income interventions which include some features of UBI, as described below. These quasi-UBI approaches are known by various terms such as: basic income guarantee (BIG), guaranteed annual income (GAI), unconditional cash transfer (UCT), and negative income tax (NIT). These variations share the common attribute of monetary benefits that would be guaranteed by the state (Van Parijs & Vanderborght, 2017), so we will use the term "guaranteed basic income" (GBI) in this review to cover all types of basic income interventions. The shorter term "basic income" is also often used in the literature as a short form of "universal basic income"; therefore, we will use the term "guaranteed basic income" (GBI) to avoid confusion. For the meaning of basic, we will use the two interpretations outlined by Hoynes and Rothstein (2019): (1) an amount sufficient to pay for one's basic needs, or (2) an amount given to each recipient that provides a base which can be supplemented by other forms of income.

We also define the 'regular' and 'predictable' payment criteria of GBI as being paid at least once per year and in the same amount each time (in real value, adjusted for inflation). Although not always considered a core criterion of a basic income, we consider regular payments of a fixed or predictable amount to be essential if GBI is used as an intervention to reduce poverty. Not knowing if the next payment will cover the same expenses as the previous one may cause anxiety and apprehension for the recipient, which could aggravate the experience of poverty. Because some programs, often described as a type of basic income, are based on dividends which change in amount over time (e.g., from oil or casino revenues), we did not consider them to be a type of GBI according to our criteria of providing stable or predictable amounts.

One form of GBI is a negative income tax (NIT), also called reverse income tax (RIT), whereby people whose income falls below some threshold would receive money from the government - that is, the money flows in the negative or reverse direction compared to regular

income tax. In this approach, a certain benefit amount is provided by the government if there is no earned or other income, and then the benefit is reduced (or 'taxed' away) as earned income rises. In this way, one's total income would never be below the 'guarantee' amount that the particular NIT plan provides. Figure 4.1 illustrates two examples of income with the NIT approach, showing how the benefit is reduced as earned income increases in each scenario. The income at which the benefit amount becomes zero is referred to as the 'break-even' point, and in both of these examples it is \$40,000. This amount was chosen to illustrate one limitation of the NIT approach: while the lower tax rate of 25% provides a greater work incentive than the 50% tax rate, the more gradual withdrawal of benefits means that the guaranteed amount has to be set lower (half as much in this case), so people who don't have other sources of income may receive less than they would from existing social assistance.

**Figure 4.1.**

*Examples of Two Negative Income Tax Variations*



The NIT guarantee amount is also somewhat arbitrary because it is determined by the breakeven point, which must be close to the liability threshold of regular income taxes. If the breakeven point is too high, then the recipient's total income would be subject to the NIT withdrawal rate as well the income tax rate, so the combined deduction (the marginal effective tax rate, METR) could be very high. For example, if the NIT withdrawal rate is 50% and the income tax rate is 20% for a certain income, then the METR would be 70%, meaning that the person would only get to keep 30 cents of each additional dollar of earned income.

The withdrawal rate or 'tax' rate on benefits in the NIT approach is alternatively referred to as a 'take-back' rate, 'claw-back' rate or 'taper' rate (due to the tapering-off of the benefit level as other income increases). Some other forms of GBI, outlined below in the results section, also have a take-back condition in the intervention whereby the benefit is reduced at a known, prescribed rate when there is additional income from employment or other sources; however, to be considered as GBI, the benefit must include a minimum guaranteed amount that is paid unconditionally (i.e., not affected by changes in income or employment status, and not conditional on job seeking or other required activities). This unconditional guaranteed amount serves to differentiate studies of GBI included in this review from those of existing social assistance programs, including those with 'soft' (minimal) eligibility conditions.

In summary, we included interventions that meet the following criteria: (1) regular payment intervals, (2) paid in cash (not in-kind), (3) a guaranteed minimum amount received unconditionally (up to some income level), and (4) paid in fixed or predictable amounts.

**A note on means testing.** In this review, we distinguish between means testing used to determine eligibility for social assistance programs, versus means testing used to recruit participants for a GBI program, pilot, or experiment. For social assistance, means testing is conducted on an ongoing basis, to monitor eligibility and to adjust the amount of the benefit if

required (e.g., reducing the benefit amount if employment income increases). We included studies of GBI interventions if participants were enrolled based on low income, unemployment, or other means-related factors. GBI interventions that use a withdrawal rate based on earned income do rely on income reports from the participants to calculate benefit amounts; however, as described above, eligibility for GBI benefits (in any amount) is not conditional on working, job seeking, or other activities required by social assistance programs.

### ***How the intervention might work***

Proponents of GBI suggest that it is a preferable way to relieve poverty than conventional welfare programs for several reasons:

1. GBI would avoid the stigmatization inherent in conditional, means-tested programs by offering the benefit to everyone within a community or at least everyone below a certain income threshold (Gentilini et al., 2020; Jenkins 2019).
2. The means testing of applicants and scrutiny of recipients in welfare programs is labour-intensive. These procedures are not necessary with GBI; thus, it would be a more efficient method of poverty reduction (Widerquist et al., 2013; Yang et al., 2021).
3. GBI is a matter of social justice which addresses growing income inequality and fosters a fairer sharing of the public wealth accumulated over successive generations (Gentilini et al., 2020; Standing, 2021).

One drawback of welfare programs is that not everyone who is eligible ends up receiving the benefit. Many people do not apply for assistance because of the stigma and shame associated with relying on social assistance, while others may not realize they are eligible for specific programs because of the complex requirements and procedures for enrolment (Bidadanure, 2019;

Gentilini et al., 2020). Take-up rates for many programs in Europe and the US are below 50%, due in part to information barriers for potential recipients, but even more so due to limited administrative functioning and communications strategies - the improvement of which would require even higher administrative costs (Lain & Julià, 2022). Another limitation of some government programs is that they are targeted toward specific populations (e.g., families with children), so other people do not qualify for assistance (Koebel & Pohler, 2019). Because everyone in the community with incomes below some threshold would be eligible for GBI, these problems would be avoided since everyone with a low income or no income would be entitled to receive the benefit.

As noted above, analyses of poverty measures based on income have found that they may not be accurate indicators of poverty. Part of the reason for this could be that these measures are based on aggregated data and do not consider individual circumstances - for example, people who retire early and live off their accumulated wealth may be grouped into the low-income category. On the other hand, some people may have incurred large debts in the past which still cause financial hardship, but they wouldn't be counted as poor if they had incomes above the official poverty line. Housing costs can also vary greatly within a population and may have a much higher impact on low-income people. In OECD countries, 36% of low-income tenants are over-burdened by housing costs (OECD, 2022). Income-based measures wouldn't discriminate between low-income households that are struggling in this way and those that aren't (for example, who live in a house without a mortgage). As pointed out by Meyer and Sullivan (2012, p. 116), "income-based measures [...] will not capture differences over time or across households in wealth accumulation, ownership of durable goods such as houses and cars, or access to credit." As such, this review examines studies of GBI interventions that use alternative measures, as described above, to assess their effectiveness for poverty reduction.

***Why it is important to do this review***

As far as we are aware, this systematic review is the first to focus only on poverty-related outcomes and to quantitatively evaluate the effectiveness of various forms of GBI for reducing poverty in developed high-income countries, using food security level, consumption, material deprivation and multidimensional poverty indicators as outcomes of interest. Although other reviews have included outcomes related to various dimensions of poverty, this review attempts to synthesize findings related to all relevant material, social, and psychological outcomes according to current multidimensional conceptualizations of poverty.

We found the following reviews that included GBI-like interventions in high-income countries (including one overview of reviews). These all differ from ours in scope and objectives:

- Hasdell (2020) conducted a synthesis of reviews, published between 2011 and 2020, of interventions globally that included at least two features of universal basic income. Three reviews for low- and middle-income countries were included that reported on food insecurity or material deprivation.
- Chrisp et al. (2022) conducted a rapid evidence review of income assistance experiments in OECD countries that included at least one of the following features: universality (within some population), unconditionality or non-withdrawability (with other income). The objective was to provide an evidence base to inform policymakers regarding knowledge gaps and suggest guidance for future experiments.
- Gentilini et al. (2020) produced a guide published by the World Bank that examined interventions similar to universal basic income globally and included one study in Sub-Saharan Africa that reported on food security. Effects on poverty were assessed

using two measures which are based on income alone: the poverty headcount and the squared poverty gap.

- Gibson et al. (2020) conducted a scoping review of interventions similar to basic income in upper- middle-income and high-income countries. This review examined health outcomes. Two included quantitative studies reported increased birthweight, one reported improved nutrition. One qualitative study was included that reported improved food security.
- Günther (2020) reviewed 60 articles as part of a Master's thesis on basic income schemes and experiments globally to evaluate income and employment elasticities.
- Gupta et al. (2021) conducted a review of basic income experiments globally and examined the effect of mitigating income poverty on mental health.
- Pinto et al., (2021) conducted a systematic review that identified 86 articles on 10 basic income interventions implemented globally to examine the various methods used to evaluate the effectiveness of the interventions.
- Somers et al. (2021) reviewed unconditional and conditional income support experiments and simulation studies from around the world, with the aim of synthesizing the evidence on intended and unintended micro- and macroeconomic effects.
- Wilson and McDaid (2021) conducted a review of qualitative and quantitative studies of basic income interventions in high income countries to examine their effects on mental health.
- Yang et al. (2021) reviewed 152 pieces of literature on basic income theories and empirical cases (15 studies globally) to analyze the relationship between conceptual definitions of basic income and how interventions have been implemented.

**Policy relevance.** Although guaranteed basic income as it is thought of today was first proposed by Thomas Paine in the 18th century, there has been a resurgence of support for GBI in recent decades by advocates in various fields: philosophy, economics, social policy, high-tech, and notably, from opposing points on the political spectrum (Alston, 2017). However, a major obstacle to constructive policy debates on GBI is that the theoretical conceptualizations of basic income - usually the universal variety - do not quite align with the ways in which GBI programs, pilots and experiments have been implemented in practice (Gentilini et al., 2020; Yang et al., 2021). The disconnect between theoretical conceptualizations and the actual designs of empirical GBI interventions, as well as the heterogeneity of these designs, makes it difficult to agree on principles to guide the development of full- scale GBI programs (Gentilini et al., 2020; Yang et al., 2021). Because empirical GBI interventions only include some features of a true universal basic income and often enroll participants based on having income below some threshold, there is also ambiguity between the definitions of these interventions and those of liberal welfare programs (with less stringent eligibility criteria than workfare programs). As well, the roles of various stakeholders - researchers, politicians, advocates, communities, news media - give rise to competing expectations which may result in misperceptions of the findings of GBI studies (Merrill et al., 2022). For these reasons, this review attempted to provide a framework/rubric to facilitate the evaluation and comparison of various types of GBI interventions, so that empirical evidence can be more objectively assessed and synthesized, and thus be more useful for policy discussions.

The inclusion of alternative and novel poverty measures in this review would also be relevant to public and social policy, particularly with respect to health and healthcare. The association between poverty and poor physical and mental health has been well documented

(Boozary & Shojania, 2018; Gundersen & Ziliak, 2015; McLeod & Veall, 2006; Seligman & Schillinger, 2010). Income, however, was found to be a weak determinant of health in a large study by the United States Department of Agriculture, which reported that income was associated with three of ten chronic diseases, while food insecurity was associated with all ten (Gregory & Coleman-Jensen, 2017). Thus, if policymakers rely on official poverty measures based on income, with the assumption that poverty is being measured accurately, vulnerable populations not identified by the poverty measure may be overlooked (Cuttillo et al., 2020).

A review of GBI interventions is relevant to discourses of public and social policy since the main goals of GBI are to reduce poverty and societal inequity. Moreover, GBI may benefit a specific population which does not qualify for regular social assistance benefits: the 'working poor' (Caputo, 2007; Koebel & Pohler, 2019; Riches & Tarasuk, 2014). While social assistance eligibility has become more restrictive in recent decades, real income from employment has remained stagnant. According to the Economic Policy Institute (EPI, 2021), productivity and workers' wages increased at almost the same rate in the United States from the 1940s until the early 1980s.

Since then, while productivity has continued to grow at the same pace, increasing by 62% between 1980 and 2020, wages have only increased by 17.5% in these four decades. Over the same time, the income gap between the rich and the poor has grown much wider: household income for the lowest quintile, adjusted for inflation, remained essentially unchanged between 1973 and 2015, and increased by about 20% for median-income families, whereas it increased by 60% for the wealthiest 5% (Stone et al., 2020). This suggests that most of the wealth generated by the increased productivity during recent decades has gone to those who are well-off financially.

The reasons for this divergence include labour laws that favor corporations over unions, decreasing tax rates for the wealthy, and small increases in the minimum wage which have not kept pace with inflation (EPI, 2021). These factors, combined with the outsourcing of jobs to developing countries, and workfare programs that place more people into precarious low-paying jobs, have resulted in increasing numbers of the 'working poor'.

## Objectives

This systematic review aimed to appraise and synthesize the available quantitative evidence on GBI interventions in high-income countries, for the purpose of comparing the relative effectiveness of specific forms of GBI for alleviating poverty. As such, we sought to answer the following research questions:

- What are the effects of various forms of a guaranteed basic income (GBI) on poverty and food security in high-income countries?
- Is there sufficient evidence available to determine a minimum amount of GBI to effect significant reductions in poverty?
- Does GBI affect subgroups within the population differently (by age, ability, education, gender, ethnicity, etc.)?
- How do estimated effect sizes vary with the type of poverty measure used (income based, consumption based, multi-dimensional measures, and food security level)?
- What is the relationship between the various measures of poverty (i.e., which ones predict similar effects across different types of interventions)?

## Methods

This review was conducted according to the methods described in the protocol (Rizvi et al., 2022), with some exceptions. Because of the atypical nature of GBI empirical research, as described below, it was necessary to modify some of the planned methods so that they were applicable to this specific area of research. The reasons for each modification are described in the relevant sections below.

To help improve the completeness and transparency of the review, we followed the Methodological Expectations of Campbell Collaboration Intervention Reviews (MECCIR) guidelines (Methods Group 2019a; Methods Group 2019b).

We stated in the protocol that we would also follow the PRISMA-Equity reporting guideline (Welch et al., 2012) because of the association between poverty and societal inequity. However, we realized that this guidance was more suited to reviews of epidemiological studies that reported data on health equity, so we decided to follow the standard PRISMA guidance (Moher et al., 2009), which is integrated into the MECCIR reporting guideline.

We also used the AMSTAR 2 critical appraisal instrument (Shea et al., 2017), intended to assist policymakers in assessing the quality of systematic reviews, to ensure that this review addressed each of the 16 items in the AMSTAR 2 checklist.

### *Criteria for considering studies for this review*

**Types of studies.** The review included primary studies that collected and analyzed quantitative data on poverty-related effects of GBI interventions. Any longitudinal study was eligible, including, but not limited to, the following designs:

- Randomized controlled trial (RCT)
- Cluster randomized controlled trial (cRCT)
- Controlled before and after (CBA)

- Regression discontinuity design (RDD)
- Interrupted time series (ITS) with at least three time points before, three time points after and a time-series analysis
- Cohort (prospective or retrospective, including repeated cross-sectional), with or without a control group, and with at least two repeated outcome measures.

Cross-sectional studies (using data from a single time point) were excluded as they do not examine change over time in a particular cohort. We also excluded predictive modelling and simulation studies, qualitative studies (e.g., case reports, narrative reports of interviews or focus groups) as well as any secondary sources. These sources included reviews and overviews of studies, books, news and magazine articles, editorials, opinion pieces, and blogs.

**Types of settings.** We included studies from any setting in developed high-income countries, according to the classification of the United Nations Department of Economic and Social Affairs (UN DESA, 2022). Some countries that fall under the high-income country category of the World Bank (e.g., Chile, Oman, Saudi Arabia) are classified by the International Monetary Fund (IMF, 2022) and UN DESA as emerging market economies, developing economies and/or developing countries. Because these terms are commonly used to refer to low- or middle-income countries in research articles, reports, and policy discussions, we only included studies from high-income countries that are classified by UN DESA as developed countries, to avoid potential confusion.

We used the 2022 UN DESA country classifications regardless of the date of the study.

**Types of participants.** We included studies involving any group of people in high-income countries (as defined above). Children were included since some studies examine outcomes for the children of parents or guardians who receive GBI benefits.

**Types of interventions.** We included any cash transfer programs for adults (18+ years old) in high-income countries that met our four criteria for GBI interventions: (1) regular payment intervals, (2) paid in cash (not in-kind), (3) a guaranteed minimum amount received unconditionally, and (4) fixed or predictable amounts.

Refundable/payable tax credits were excluded because they are either small in amount (i.e., not enough to provide an income ‘base’) or they are conditional (e.g., being employed, enrolled in a training program, having children of a certain age, caring for adults, or having a disability).

GBI benefits could be paid on an individual or household basis. The interventions could be administered by governments (usually as pilot projects) or by non-governmental or civil society organizations for research purposes. In studies that included control groups, usual care would be in the form of conventional government assistance programs for participants who were eligible to receive them and no government assistance for those who were not.

**Types of outcome measures.** This review examined two primary outcomes. The first was food security level, which is typically assessed using survey-based, self-reported and validated measures of food security. The survey responses are quantified using scoring rubrics, which vary among high-income countries. Examples of measures include the UN FAO Food Insecurity Experience Scale (FIES) (FAO, 2018), used in Europe, and the Household Food Security Survey Module (HFSSM) (USDA, 2022), used in the United States and Canada (the same survey but with slightly different thresholds for levels of food insecurity).

The second primary outcome was poverty level assessed using measures that are intended to determine poverty thresholds or to index poverty levels across national or international contexts. Examples of eligible instruments included:

- National or international measures such as the United States' Official Poverty Measure (OPM) and Supplemental Poverty Measure (SPM) (IRP, 2017), Canada's Market Basket Measure (MBM) (Statistics Canada, 2022), OECD relative poverty measure, and the poverty gap index (OECD, 2022)
- Consumption-based indicators such as the Household Budget Survey (HBS) (Eurostat, 2023), and Consumer Expenditure (CE) Survey (US Census Bureau, 2021)
- Measures of deprivation such as the European Union's Material Deprivation (MD) Index (Eurostat, 2012), and other measures of ability to cover basic needs.

For the secondary outcomes, all measures listed below were eligible for inclusion. Some outcomes such as weight and height measures, used to determine body mass index (BMI), are measured using instruments or self-reporting, while other outcomes such as self-reported health status are measured using validated scales (e.g., the SF-12 Survey for physical and mental health; RAND, 2018) or subjective ratings (e.g., 0-10 scale). Some secondary outcomes can be individual components of poverty indicators (e.g., food expenditure would be a component of a consumption measure).

We did not exclude studies based on specified outcomes because we expected to find other poverty-related outcomes reported in studies, which were important to include in this review.

### ***Primary outcomes***

- Food security level (using survey-based, validated measures, as described above)
- Poverty level assessed using instruments intended or designed to measure poverty: income-based official poverty measures; novel national or international measures of material

hardship/deprivation or consumption of goods and services; multidimensional measures of physical, social and/or psychological wellbeing.

### ***Secondary outcomes***

- Food expenditure
- Self-reported physical health
- Self-reported mental health
- Body mass index (BMI)
- BMI for age
- Mid-upper arm circumference (MUAC)
- Birth weight of children
- Cognitive development, literacy, and numeracy of children
- School/training program enrolment (children and adults)
- Individual/household earnings

**Duration of follow-up.** No restrictions were placed on the duration of follow-ups.

**Language.** We limited the included studies to those that were published in English.

Although our team included multiple reviewers who were fluent in French, Spanish, and other languages, it was not feasible for pairs of reviewers who spoke the same non-English language to commit to all the stages of the review that had to be conducted in duplicate (i.e., screening, data extraction, and risk of bias assessments)

### ***Search methods for identification of studies***

This review focused on studies that investigated GBI programs, pilots and experiments in developed high-income countries. The search strategy used for this review builds on those used in previous reviews on GBI (Gibson et al., 2020; Pinto et al., 2021). Searches using both

keywords and database-specific controlled vocabulary were conducted in relevant databases, and complementary searches were done to identify additional studies as well as pertinent grey literature.

**Electronic searches.** Searches were conducted in subject-specific and multidisciplinary databases to identify relevant published studies to include in this review. Searches were executed by PRL in the following databases (in alphabetical order): APA PsycInfo (Ovid), Academic Search Complete (EBSCOhost), Business Source Complete (EBSCOhost), Cochrane CENTRAL (Ovid), CINAHL (EBSCOhost), EconLit (EBSCOhost), Embase (Ovid), Global Health (EBSCOhost), International Bibliography of the Social Sciences (ProQuest), International Political Science Abstracts (EBSCOhost), MEDLINE (Ovid), PAIS Index (ProQuest), Sociological Abstracts (including Social Services Abstracts, ProQuest), Web of Science (Science Citation Index Expanded, Social Sciences Citation Index, Arts & Humanities Citation Index, Emerging Sources Citation Index; Clarivate), Worldwide Political Science Abstracts (ProQuest).

Database limits were not used, and no restrictions related to languages or dates were imposed when searching the above resources. Some databases indexing various publication types were limited, to retrieve only scholarly journal articles, theses, or reports.

An initial, sensitive search strategy was developed for MEDLINE (Ovid). Given the scope of this review, the research librarian (PRL) and principal investigator (AR) determined that searching broadly for studies related to GBI would suffice and that no additional concepts would be included and combined. To assess its effectiveness, the strategy was peer-reviewed by another research librarian following the Peer Review of Electronic Search Strategies (PRESS) guideline for systematic reviews (McGowan et al., 2016). This search strategy was then translated for the other databases using pertinent subject headings, where applicable, as well as appropriate search

syntax. The complete search strategies are available in Appendix 3. Searches were executed on May 16 and 17, 2022.

In addition to using the above resources, searches were done in the Cochrane Database of Systematic Reviews (Ovid), the Campbell Systematic Reviews journal (Wiley), the Social Systems Evidence database (McMaster University), and Epistemonikos (via the Cochrane Library) to identify relevant review articles.

Included studies were added to Zotero, which integrates notifications from Retraction Watch (<https://retractionwatch.com/>), to determine if any of them have been retracted. The Retraction Watch website was also used to search for each included study to ensure that none were retracted. Both steps were performed in October 2022.

**Grey literature.** Various approaches were used to identify relevant grey literature.

To find conference proceedings, both the Science and the Social Sciences & Humanities editions of the Conference Proceedings Citation Index were searched (at the same time as other indexes on the Web of Science). In addition, reviewers consulted specific conference websites for the BIEN Congress (<https://basicincome.org/congress-papers/>) and for the Annual Basic Income Guarantee (BIG) Conference (<https://usbig.net/2022congress/>) to browse proceedings and presentations made from 2017 through 2022.

To identify relevant graduate research, a search was conducted in ProQuest Theses & Dissertations Global (ProQuest). Additional theses were found through other electronic databases mentioned above that also index graduate works.

To identify relevant government documents and other types of grey literature such as white papers and preprints, we searched the websites and catalogues of the following organizations:

- United Nations (via ODS; <https://documents.un.org/prod/ods.nsf/home.xsp> and via the UN Digital Library; <https://digitallibrary.un.org/>)
  - World Bank (via the Open Knowledge Repository; <https://openknowledge.worldbank.org/> and via its eLibrary; <https://elibrary.worldbank.org/>)
  - World Health Organization (<https://www.who.int/publications>),
  - Social Science Research Network (<https://www.ssrn.com/>),
  - National Bureau of Economic Research (<https://www.nber.org/>)
  - Research Papers in Economics (<https://repec.org/>)
  - Institute of Labor Economics (<https://www.iza.org/>)
- OECD (via its iLibrary [subscription access])

Targeted, specific searches of government websites of Group of Seven (G7) high income countries were also conducted:

- Canada; <https://publications.gc.ca/site/eng/home.html>
- France; no search option for English
- Germany; <https://www.bundesregierung.de/breg-en/service/information-material-issued-by-the-federal-government/>
- Italy; no search option for English
- Japan; <https://www.japan.go.jp/publications/index.html>
- United Kingdom; <https://www.gov.uk/official-documents>
- United States; <https://www.govinfo.gov/>

To locate grey literature as described above, members of the review team searched sites and tools throughout September 2022 using the following phrases: basic income, unconditional cash transfer, unconditional cash transfers, negative income tax and guaranteed annual income.

**Other resources.** In addition to searching for grey literature, other means of identifying studies were used from September to December 2022, as described below.

Reference lists from relevant knowledge syntheses (systematic and non-systematic reviews) as well as those from included primary studies were examined to see if other studies should be considered. Citation searching of the included articles was also conducted using Google Scholar (<https://scholar.google.com/>).

Once title and abstract screening was completed, journal titles of references eligible for full-text review were analyzed to select the five journals that appear most frequently. These journals (American Economic Review, American Journal of Sociology, Australian Journal of Social Issues, Basic Income Studies, Journal of Human Resources) were then hand searched in December 2022 by looking specifically at each issue's tables of contents for 2017 through 2022.

Internet searches were continued by the principal investigator (AR) until December 2022 (while the screening and data extraction stages were completed) to identify any missed or newly published articles that would be eligible to include.

### ***Data collection and analysis***

**Description of methods used in primary research.** GBI interventions (programs, experiments, and pilot studies) have typically been carried out within selected geographic regions with participants whose income falls below a certain threshold amount. Some interventions employed a saturation approach where every eligible person in the community who enrolls received the benefit, so that community-level effects could be examined. Programs which would meet our criteria for GBI could also target specific populations. Although the types of outcomes were numerous, data were usually collected using surveys completed by participants, while for other outcomes, data were obtained from administrative databases such as school board records or police records.

Most basic income experiments that matched our GBI criteria were conducted as randomized controlled trials (RCTs) with intervention and control groups, while others were of a quasi-experimental (observational) nature, some using statistical controls such as propensity score matching to reduce bias.

**Selection of studies.** All stages of reference screening were conducted with the use of Covidence, an online tool designed to streamline certain stages of review projects (<https://www.covidence.org/>). A summary of the inclusion and exclusion criteria (see Appendix 4) was posted on Covidence for reference during the screening process. The selection of studies began with title and abstract screening, performed independently by two reviewers. In case of disagreement, the decision on including the reference was made by the principal investigator. The same process was used at the full-text screening stage to determine the eligibility of the references that were retained after title and abstract screening. The reasons for excluding references at this stage were recorded and summarized in a PRISMA flow diagram.

Both screening phases were subject to a pilot phase to ensure that the inclusion and exclusion criteria were clear and applied consistently. Reviewers provided feedback during both pilot stages regarding the clarity of the inclusion and exclusion criteria, and we refined the wording based on the feedback if two or more reviewers agreed with the suggestion.

The title and abstract screening procedure was piloted by six reviewers (MBD, MKS, MMK, MYY, OD, OM) on 25 randomly selected references. After the pilot phase, the title and abstract screening was completed by nine reviewers (AA-Z, AKH, AR, MBD, MKS, MMK, MYY, OD, OM).

The full-text pilot was conducted by five reviewers (AA-Z, AR, KH, MBD, MMK) on 15 randomly selected references (from those remaining after title and abstract screening).

Subsequently, the full-text screening was completed by six reviewers (AA-Z, AKH, AR, MMK, PRL, OD).

**Exclusion of studies.** We excluded studies at three stages: title and abstract screening, full-text screening, and data extraction.

We did not screen references by outcome because we did not know in advance exactly which poverty-related outcomes would be reported in the included studies. As well, some studies might have examined eligible outcomes as secondary outcomes, so we didn't want those studies to be excluded at the preliminary title/abstract screening stage.

After data extraction was completed and all the reported outcomes were compiled, we identified outcomes that, while generally associated with poverty, were ambiguous in their effect on poverty. That is, for these outcomes it was not clear whether the experience of poverty was ameliorated or exacerbated when a change in the outcome was reported. Studies were excluded if they only reported outcomes of this type.

Outcomes that could be poverty-related but were ambiguous as to the direction of poverty reduction within the study were: marital stability or dissolution (separated spouses received more in combined benefits, but combined individual expenses were higher also), awareness of social services (no longer relevant to current programs), "fertility" (larger households received larger benefits) and moving/migration.

We excluded employment-related outcomes such as job searching and labour market participation (LMP) because having a paid job involves work-related expenses (transportation, clothing, purchased lunches, childcare, etc.). The studies that examined such outcomes were based on interventions which entailed reductions in benefit payments as employment income increased, so it was not clear if participants were financially in a better or worse position if the amount of paid work increased.

We also excluded studies at the data extraction stage if they were deemed by two reviewers to include some aspect that did not match our eligibility criteria.

Lastly, we excluded studies on experiments conducted or completed after February 2020 because of the potentially confounding impacts of the COVID-19 pandemic.

**Data extraction and management.** Data was extracted by two reviewers working independently, using an extraction form in Excel (Microsoft 2022), based on the coding template in Appendix 5. The form was piloted with five studies with diverse designs and outcomes, to check if more questions or categories were required in the form to capture all relevant information on the population, setting, study design, intervention, data collection and analysis, and outcomes. Five reviewers (AA-Z, AR, MBD, MKS, MMK) performed the pilot extractions on two studies each, resulting in five pairs of completed extraction forms. The revised extraction form was then used for the rest of the included articles, five of which were done by the reviewers that did their extractions for the pilot. The extractions for all the included studies were completed by 19 reviewers (AA-Z, AC, AR, EG, HNE, HS, JMPA, LG, LI, MBD, MG, MKS, MMK, NE, OD, OM, SIH, SN, SR) working in pairs on each study. Each pair of reviewers exchanged their forms by email, and discrepancies were discussed and reconciled to create a final extraction form for each study.

For multi-arm studies, we included only the intervention and control groups that met our inclusion criteria. We note in the 'Table of characteristics of included studies' (Table 4.3) where ineligible arms were excluded.

We did not extract statistical results data into the extraction forms because effect estimates were often presented in complex ways, with various subgroup results reported for up to eight intervention arms, sometimes in several tables, for each outcome. It was more efficient to note the relevant table numbers for each outcome in the extraction form, and then refer to the

original tables during the analysis stage of the review. This also reduced the likelihood of transcription errors and losing discrete or disaggregated data presented in the original tables. Where meta-analyses were possible, the data were entered into the RevMan analysis tool by AR. Where meta-analyses were not possible, the data were entered into the results tables created in RevMan by AR for each outcome category.

**Assessment of risk of bias in included studies.** We used an adapted version of the risk of bias tool described by Sharma Waddington and Cairncross (Sharma Waddington and Cairncross 2021), which builds on previously developed tools (Eldridge et al., 2016; Higgins 2 et al., 016; Hombrados and Waddington 2012; Jimenez et al., 2018; Sterne et al., 2016; Waddington et al., 2017), and combines scoring criteria for randomized and non-randomized designs so that the quality of studies using either design can be compared.

We assessed the risk of bias in the included studies across the following seven domains:

- Confounding (non-experimental differences between intervention and groups, or imbalances not controlled in analyses)
- Selection bias (study sample at baseline is not representative of the target population)
- Attrition bias (entire sample or study group at endline is different in relevant characteristics from baseline)
- Motivation bias (participants' responses are affected by their involvement in or knowledge of the experiment)
- Implementation bias (intervention is not received by all participants or not received as intended)
- Measurement error (use of subjective, inaccurate, or inappropriate measures)

- Analysis and reporting bias (inadequate analysis methods, selective reporting, or no pre-analysis plan)

Sharma Waddington and Cairncross also include an eighth domain (unit of analysis error), which we did not incorporate into our risk of bias assessments since we addressed this type of bias separately, as described in the 'Unit of analysis issues' section below. We used the term 'implementation bias', whereas the term in the original, cited tool is 'performance bias'. Lastly, for the 'selection bias' domain, we added 'truncation' as a potential source of bias since many studies used an income threshold for participant enrollment, and we removed 'immortal time' as an example of data censoring since none of the included studies in our review examined mortality outcomes.

Each study's risk of bias was assessed independently by two reviewers from among AA, AA-Z, AC, AR, BJS, EK, JJ, LI, MBD, MMK, MYY, NE, OM, SH, and SR. Ratings of 'low risk', 'some concerns' or 'high risk' were assigned for each of seven domains. We resolved discrepancies by consensus, and in case of disagreement the higher risk of bias rating of the two reviewers (i.e., the more cautious rating) was used for the reconciled assessment. To calculate an overall risk of bias score, we converted the ratings to numerical values (low risk = 1, some concerns = 2, high risk = 3) and then summed up the values to get an overall score between 7 (low risk in every domain) and 21 (high risk in every domain). This approach gives equal weight to each domain and assumes that the risk of bias is additive, such that if a high risk of bias is assessed for three domains, for example, then the overall risk would be much higher than if only one domain is assessed to have a high risk of bias. There are limitations to using an overall score in systematic reviews, especially if studies are weighed by their quality in meta-analysis (Jüni et al., 2001); however, we did not use the overall scores for the purpose of weighting, but rather as a way to summarize and compare the risk of bias across the included studies.

**Measures of treatment effect.** We conducted meta-analyses when comparisons across studies were feasible, if point estimates and confidence intervals were provided or could be calculated using the reported data. In most cases, pooled estimates were not feasible due to heterogeneity in outcomes, populations, and interventions. In these cases, we performed meta-analyses (without pooled results) to conduct comparisons and depict them visually as forest plots.

Where sufficient statistical information was provided in each included study, we calculated Cohen's  $d$  as the standardized mean difference (SMD) to estimate true effect sizes, along with 95% confidence intervals, to compare effect sizes where two or more studies report on the same outcome but measure it in different ways. The magnitude of the SMD or  $d$  indicates the number of standard deviations between the means that are being compared (e.g., for the intervention and control groups).

The calculation of  $d$  was performed using the Campbell Collaboration effect size calculator (<https://www.campbellcollaboration.org/escalc/html/EffectSizeCalculator-SMD-main.php>). This tool provides separate interfaces for inputting various types of statistics to calculate the SMD, including  $t$  values,  $t$ -test  $p$  values, means with standard deviations (SDs) or standard errors (SEs), binary proportions, frequency distributions (for categorical variables), and regression coefficients (standardized and unstandardized).

If studies reported only means (or mean differences) without SDs,  $p$  values,  $t$  values or confidence intervals, or only provided graphical representations of the effect estimates (e.g., box-and-whisker plots), we contacted the corresponding authors of those studies (if published within the last ten years) to ask if these statistics could be provided.

We investigated whether it was necessary to use Hedges'  $g$  instead of Cohen's  $d$  as the standardized mean difference because Hedges' method uses a correction factor in calculating the

SMD to reduce bias due to small sample sizes, which can exaggerate the effect size (Borenstein and Hedges 2019).

We tested the correction factor [ $J(df) = 1 - (3 / (4df - 1))$ ] on the two included studies with the smallest sample sizes (N=138 in Mallar 1977, N=266 in McDonald 1979) and found that the correction was less than 1% in both cases. Since this value was negligible and the other included studies had larger sample sizes, we chose to use the more common  $d$  as the SMD for estimating true effect sizes.

We used a significance level of 5% (i.e.,  $p = 0.05$ ) as a threshold to decide whether there was evidence of an effect for each outcome. Although it is preferable to examine effect estimates along with their confidence intervals instead of relying on  $p$  values (Schünemann 2023), this was not possible for most of the included outcomes because the confidence intervals were not reported by the study authors or there was not enough statistical information reported to calculate them. Conversely,  $p$  values were either reported in all the studies or we were able to calculate them (e.g., using reported  $t$  values). Therefore, using  $p$  values provided a consistent way of interpreting the findings, whether we were able to calculate a pooled result across studies or where a particular outcome was only reported in a single study.

We recognize that using a  $p$  value threshold is somewhat arbitrary, based on the need to "draw the line somewhere" in terms of certainty. We also recognize that a  $p$  value greater than 0.05 indicates a lack of evidence (e.g., due to an inadequate sample size) and not evidence that the intervention did not affect the outcome (Schünemann 2023). This is especially relevant to the results of the included studies because the determination of  $p$  values (as well as confidence intervals) assumes that study samples are randomly drawn from the population (Andrade 2019), and that was not the case with most of the GBI experiments. Therefore, additional caution was

warranted when interpreting the findings from individual studies; thus, results with  $p$  values higher than 0.05 were interpreted as 'no evidence of effect'.

**Unit of analysis issues.** Unit of analysis error can occur when the intervention is provided at a cluster level (e.g., school, clinic, or household) and the analysis is conducted at the individual participant level (e.g., student, patient, or husband/wife). The responses of participants from the same cluster unit (e.g., spouses in a household) may be more similar to each other than to other participants in the study. Because the responses in the same cluster may not be independent, an individual-level analysis using the total sample size may underestimate the true variance. If multiple observations per cluster were included in the study, we assessed if the researchers used an appropriate analysis approach, such as multilevel modelling, variance components analysis, or cluster-level fixed effects, to yield more realistic confidence intervals and  $p$  values.

If this potential bias is not controlled for in the study, a corrected standard error, SE', can be calculated as:

$$SE' = SE \times \text{SQRT}(1 + (m-1) \times ICC)$$

where SE is the uncorrected standard error,  $m$  is the number of observations per cluster, and ICC is the intra- cluster correlation coefficient (Waddington et al., 2012).

If there is insufficient data to calculate the ICC, the value can be estimated based on the reported ICC in other similar studies on similar outcomes (Hedges, 2007). However, we were unable to find studies that reported consistent ICCs to draw on, especially with household-level interventions, so we were unable to calculate the corrected SE. It is unclear whether this is a problem since most of the included studies in this review only used observations from one person per household (usually the recipient of the GBI benefit). In studies where more than one spouse or child per household was observed, the average number of individuals per household

was approximately 1.6 because some households had single heads (i.e., only one participant per 'cluster') and observations on children were usually for a limited age range, resulting in one or two children typically sampled from the same household. Using the formula above and inputting a 'medium' ICC value of 0.5, the correction factor for the standard error would be 14% (i.e., the square root of  $1 + [(1.6 - 1) \times 0.5]$  is 1.14). Therefore, to account for possible unit of analysis error, we treated effect estimates with caution if the confidence interval of the reported or calculated SMD came close to zero.

We had also planned to calculate the SMD for cluster-design studies using a Shiny app developed by Taylor and colleagues (2022) ([https://airshinyapps.shinyapps.io/es\\_2lvl\\_clust\\_adj/](https://airshinyapps.shinyapps.io/es_2lvl_clust_adj/)), but this tool also requires inputting an ICC value, which we did not have. To address this problem, we did not pool the results of studies of individual-level interventions with those of household-level interventions where observations were made on more than one member.

**Criteria for determination of independent findings.** Although we expected to find multiple reports of each GBI study, only two of the included articles reported on the same study. In this case, we used the data from the newer article for outcomes that were reported in both. For outcomes which were only reported in the older article, we extracted the relevant data from that one. All the other included articles reported on individual studies.

While some of the included studies drew on one common dataset, we found that the datasets from GBI experiments were in effect databases or repositories containing data on a variety of outcomes in different fields of study (economic, epidemiological, social, etc.). The authors of the included studies drew on this data in a way that is similar to researchers using administrative data in their studies. As such, most of the included studies relied on a different subset of data.

In one case, there was an overlap in the outcomes reported in two studies on the same experiment; however, only one of the studies provided disaggregated results by intervention arm. Since some of the arms did not meet our inclusion criteria, we only used the results for eligible arms from the more comprehensive report in our meta-analysis.

**Dealing with missing data.** Studies were not excluded on the basis of which data were reported. If an included article did not report statistical data necessary for meta-analysis and the data could not be calculated reliably (e.g., using reported confidence intervals to calculate SDs), we contacted the study authors to ask for the missing data if the article was published in the last 10 years (since 2012). This period is based on requirements for researchers to store data for a minimum of three to six years, depending on the country, institution, or funder (Elsevier, 2022.) If we could not acquire the necessary statistical information from study authors, we did not use the result in the meta-analysis, but we did include it in the narrative synthesis.

**Assessment of heterogeneity.** We had planned to use the  $I^2$  statistic, calculated using RevMan, to examine heterogeneity. However, Borenstein (2022) recently proposed that the  $I^2$  statistic is misused as a measure of heterogeneity and does not tell us how much the true effects vary (which we want to know in order to see if subgroup analysis is needed to explain the variation). Borenstein argues that the extent of heterogeneity is best represented by the prediction interval, which expresses another heterogeneity measure, Tau-squared ( $\tau^2$ ), in an understandable way (Deeks et al., 2022). However, all of these measures ( $I^2$ ,  $\tau^2$ , and prediction intervals) require a sufficient number of studies in order to provide a useful indicator (Borenstein, 2022; Deeks et al., 2022; Higgins et al., 2003). The Cochrane Handbook recommends that more than 10 studies are needed to assess heterogeneity using such methods (Deeks et al., 2022).

Because there was an insufficient number of studies that we could meta-analyze for any outcome, the above statistical assessments of heterogeneity were not appropriate, and therefore

we employed “a subjective examination of the variability in point estimates and the overlap in [confidence intervals]” (Guyatt et al., 2011, p. 1296) by examining the forest plots that were generated in RevMan for our meta-analyses. If any two confidence intervals in the plot did not overlap or barely overlapped, we considered this as an indication of substantial heterogeneity, and investigated whether it could be explained by differences in the interventions, the populations, or other factors.

**Assessment of reporting biases.** The GBI experiments covered by the included studies were all conducted by governments (federal, state/provincial, or municipal) in partnership with research organizations (private or university-based). Although some of the articles were published in peer-reviewed journals (while the rest were published by the research organizations), we believe publication bias is unlikely for several reasons: (1) the direct relevance of GBI experiments to many fields of interest (politics, economics, health, social studies, human rights, etc.); (2) the large scale of the experiments, conducted publicly (not in a laboratory or other secluded setting); and (3) publicity in the news media due to opposing views on unconditional government-funded income support.

To determine if outcomes were selectively reported or omitted, we searched for proposals, pre-analysis plans, and protocols, and checked those that were found to see if they specified unreported outcomes.

Selective outcome and analysis reporting were also examined as part of the risk of bias assessments described above.

### **Data synthesis**

***Quantitative Synthesis.*** Extracted data for use in meta-analyses was entered into RevMan by AR. Most of the effect estimates had to be converted from the reported format into SMDs because the raw units were not comparable across studies, so it was not possible for a second

reviewer to verify the accuracy of the entered data (i.e., because the original data wasn't always used). To decrease the likelihood of data entry errors, the reviewer used the copy and paste functions whenever possible to enter values into the effect size calculator, and from there into the RevMan data fields and the results summary tables.

When there was sufficient and appropriate data to conduct meta-analyses (i.e., two or more studies with the same design reporting on the same outcome), we calculated the pooled effect size using RevMan. We conducted random-effects meta-analyses to account for the observed between-study heterogeneity.

The RevMan Web version provides a calculator for combining multi-arm interventions with a single control group, which avoids double counting of participants in the control group. (Previous versions of RevMan required dividing the number of participants in the control group by the number of eligible intervention groups in the meta-analysis.)

***Narrative synthesis.*** Due to the variation across GBI interventions, study designs, populations, and outcome measures, meta-analyses were not possible for many of the outcomes. In these cases, we present the findings of these studies in narrative form, including calculated effect sizes where possible.

We constructed tables to classify the studies according to the type of GBI, study design, and outcomes. We also illustrate effect sizes graphically with forest plots for studies that could be grouped and compared in a meaningful way.

**Subgroup analysis and investigation of heterogeneity.** We had planned to conduct subgroup analyses according to the study design (cluster randomized controlled trials (cRCTs), controlled before and after (CBA), etc.), study duration (<2 years, 2-4 years, >4 years), generosity of GBI benefits (relative to the official poverty line), individual/household level payment modality, poverty level threshold for eligibility (e.g., income below official poverty

line, no income threshold), and take-back rate if there is additional income from other sources. However, many of these analyses were not possible due to the diversity of outcome measures across different types of interventions. Where the feasible meta-analyses revealed substantial heterogeneity, we examined which factor(s) listed above could best explain the observed variation in estimated effect sizes.

There were not enough included studies to meaningfully compare the difference in effect across subgroups, so a meta-regression to test the mean difference between the groups was not feasible.

To examine whether GBI interventions impact social, economic, and health inequities across different population subgroups, we assessed the effects of GBI on reported outcomes using the sociodemographic categories of the PROGRESS-Plus framework. The PROGRESS acronym stands for place of residence, race/ethnicity, occupation, gender, religion, education, social capital, and socioeconomic position, while 'Plus' refers to any other factors which may be associated with disadvantage, such as age, criminal record, disability, or sexual orientation (Kavanagh et al., 2009; O'Neill et al., 2014). Depending on the context of the study, a 'Plus' factor may be the most relevant (O'Neill 2014).

The original PROGRESS-Plus framework uses the term 'socioeconomic status' (SES). We use 'socioeconomic position' (SEP) to denote the same concept, according to the reasoning of Krieger and colleagues (1997, p. 346): “‘socioeconomic status’ blurs distinctions between two different aspects of socioeconomic position: (a) actual resources, and (b) status, meaning prestige- or rank-related characteristics.”

While PROGRESS-Plus is typically used in epidemiological studies to examine sociodemographic determinants of health, we considered it to be appropriate for investigating potential inequities for other types of outcomes as well.

We presented the findings that were reported across PROGRESS-Plus factors in tabular format, as there was too much heterogeneity in the interventions, outcomes, and study populations to conduct subgroup analyses.

**Sensitivity analysis.** We verified the robustness of the meta-analyses by comparing the quality of the studies (as determined by our risk of bias assessments) to ensure that the effect sizes were not excessively influenced by one or more low quality studies.

**Treatment of qualitative research.** We did not include qualitative research in this review.

**Summary of findings and assessment of the certainty of the evidence.** We present a GRADE 'summary of findings' table in the Results section, which includes an assessment of the certainty of the evidence, following the method of Schünemann and colleagues (2019). We explored whether separate tables could be constructed for each type of GBI intervention (e.g., subsistence-level benefits for households, or monthly amount below €500 for individuals), but due to the diversity of outcomes across different interventions, separate tables would have essentially presented individual findings rather than a meaningful summary.

Summary of findings tables typically include up to seven outcomes, selected *a priori*, which are deemed to be the most important for the review (Schünemann et al., 2019). While this is feasible in epidemiological reviews (e.g., mortality would be considered more important than mobility), it was not possible for us to rank the importance of the included outcomes because they covered various aspects of life. Additionally, we didn't screen studies by outcome so that we could find other relevant poverty-related outcomes that were reported in eligible studies, and thus we couldn't rank outcomes *a priori*. Therefore, we included in our summary of findings the two primary outcomes of interest, as well as five other outcomes which were reported in more than one included study.

The five secondary outcomes were selected on the basis of relevance to the present time, so at least two studies that reported the outcome had to be from the last two decades.

The GRADEpro software (<https://www.gradepro.org/>) was used to assign an overall level of the quality of evidence for each assessed outcome – i.e., our level of certainty that the estimate of the effect is close to the true effect. The quality of the evidence was ranked as 'high', 'moderate', 'low', or 'very low' according to assessments across five categories: risk of bias, publication bias, indirectness of outcome measures, imprecision, and inconsistency of effect estimates.

The GRADE assessment was conducted by AR and verified by JP, who has previous experience with the GRADE approach.

### *Subject-specific methods used in this review*

In conducting this review, we encountered methodological challenges that may be unique to the body of research addressed here. As noted above, most of the included studies drew on data from large-scale experiments that collected data on various aspects of the participants' lives, to see how the GBI interventions impacted them. This posed a problem for the typical nomenclature of 'studies' and 'articles/reports' in systematic reviews, because the included articles described each of the various studies, but there were several studies on the same GBI experiment. While numerous studies draw on population statistics in administrative databases, the data used here were obtained experimentally (by other researchers), so this introduced another level in the overall research process, as explained below.

**Experiments, studies, and reports.** The terms 'experiment' and 'study' usually refer to the same undertaking, conducted by the same researcher(s). In the case of most of the research included in this review, the design, recruitment, implementation, and data collection stages were

conducted independently of the analysis and reporting stages. One drawback of this in conducting a systematic review is that many of the articles that reported findings provided very little, if any, information on the design and implementation methodology.

Additionally, various types of outcomes (economic, social, epidemiological, educational, etc.) were examined by different researchers, each leading to a distinct 'study' of the effects of the intervention. For this reason, it was necessary to classify the research activities as either 'experiment' or 'study' in order to conduct a meaningful review. For example, referring to the Seattle-Denver study would cause confusion because that would only tell us about the intervention and where it took place, whereas there were many individual studies conducted using the data collected during the implementation/intervention process. Therefore, to clarify which stage of the research we are referring to in this review, we use the following terms:

- 'experiment' to refer to the intervention and to the research stages up to data collection and storage (e.g., the Seattle-Denver experiment),
- 'study' to refer to the work of the researchers that analyzed a subset of data on specific outcomes from one of the experiments,
- 'article' to refer to published material that reports the findings of a particular study.

### ***Classification of GBI experiments***

We stated in the protocol (Rizvi 2022) that we would "attempt to develop a framework or rubric to facilitate the evaluation and comparison of various types of GBI interventions, so that empirical evidence can be more objectively assessed and synthesized and be more useful for policy discussions" (p. 6). While conducting this review, we learned that it was impossible to conduct a meaningful synthesis without first developing a framework or typology because, while 'guaranteed basic income' is usually discussed as a singular concept, the empirical evidence

comes from many different variations of income support interventions that all meet the criteria of GBI. Thus, it was vital to specify the type of GBI intervention when considering the evidence; otherwise, our findings would be almost as vague as those of a systematic review seeking to determine "the effects of drugs."

The classification framework was developed by AR and verified by the co-authors. To categorize the various GBI approaches used in the included studies, an inductive approach was used wherein the specific attributes of each GBI intervention were coded according to the GBI benefit structure (e.g., fixed or income-dependent), whether the GBI replaced or supplemented existing social programs, how other income impacted the benefit amount, and whether the benefit was paid to individuals or households. The resulting classifications were then compared to theoretical conceptualizations of GBI, to identify other possible types of interventions which were not used in the included studies, but which could potentially be implemented in an experiment or as a full-scale program.

The resulting framework (described in the section below and summarized in Table 4.2) allowed us to categorize the various GBI interventions so that the empirical evidence could be compared in a meaningful way.

The development of this typology was a process separate from the systematic review itself; however, we present the typology in the Results section because it was a product of the analysis stage of the review, based on the characteristics of interventions used in the included studies, as well as conceptualizations of GBI explored in the sections above.

## Results

### *Description of studies*

The following sections describe the body of research that was included in this review and how it was compiled, starting with the screening of potentially relevant references and articles.

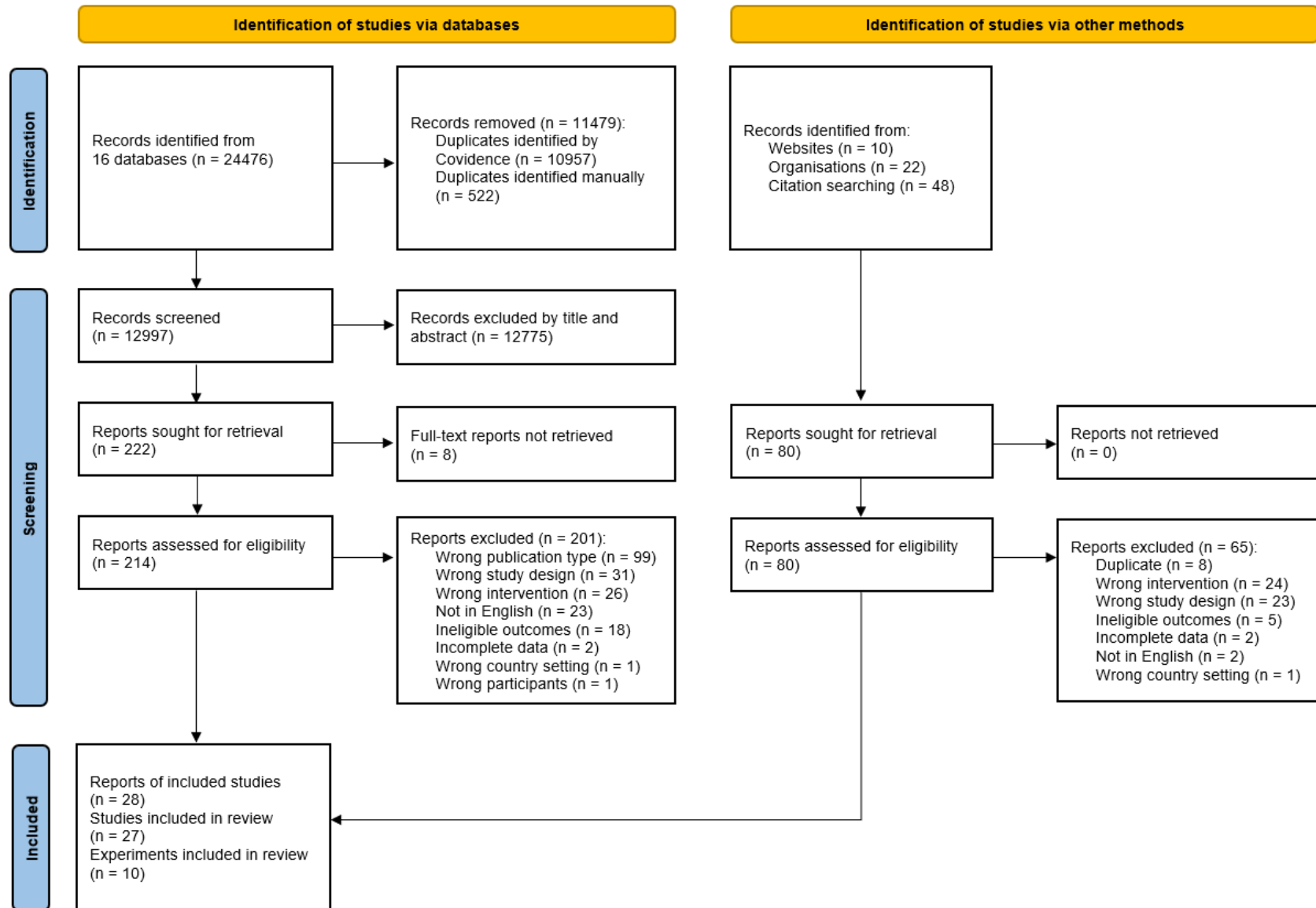
**Results of the search.** The results of the search and screening process are illustrated in Figure 4.2. The 16 databases searched yielded 24,476 references. Eighty (80) references were identified from grey literature and through citation searching. Deduplication processes resulted in the identification and removal of 11,487 duplicate items (11,479 database results, plus eight retrieved by other methods). The titles and abstracts of 12,997 references were reviewed in duplicate and 12,775 were excluded. The full texts of eight references could not be retrieved. Full texts for 286 references (214 from databases, and 72 found by other methods) were assessed, in duplicate, for eligibility. The hand searching was, in effect, a type of screening process because the reviewers involved were familiar with the inclusion criteria. As such, the principal investigator (AR) acted as the second screener for the records retrieved in this way.

A total of 266 full-text articles were excluded; the most common reasons for exclusion were wrong publication type (n=99), wrong study design (n=54), wrong intervention (n=50), and being written in a language other than English (n=25). Following this two-stage review process, we included 28 articles in this review which report on 27 studies of 10 experiments.

We found one published article for each of the included studies with the exception of Forget 2011/2013, for which the 2013 article elaborates on some of the findings reported in the 2011 publication. Thus, we found a total of 28 articles that report on the 27 included studies.

Figure 4.2.

## PRISMA Flow Diagram of The Search and Screening Process



**Included experiments.** A summary of the ten included experiments is presented in Table 4.1. Nine experiments employed RCT designs. One of these, the Mincome experiment conducted in the Canadian province of Manitoba, included two sites: one in the city of Winnipeg (RCT site) and a 'saturation' site in the town of Dauphin where every resident with income below the eligibility threshold could receive benefits, to simulate a full-scale GBI program.

The tenth included experiment is a non-randomized retrospective study of the Canada public pension, which is implemented using a negative income tax approach such that people of age 65 and above with no other income receive a fixed amount (approximately 80% of the national poverty line). For recipients with other income, their pension benefit is reduced by a percentage of their income from other sources (McIntyre 2016a).

Five of the experiments were conducted between 1968 and 1978, four were conducted between 2017 and 2020, and the Canada pension study examined data from 2007 to 2013.

We found 27 studies on these experiments that met our inclusion criteria. The characteristics of these studies are described in Table 4.3 below. We first present the typology of GBI approaches in Table 4.2, so that the descriptions of the interventions in the study characteristics table can be more easily understood.

### ***Typology of GBI approaches***

Our framework consists of five types of GBI, which are based on how the intervention would be implemented as a full-scale program in terms of benefit receipt; that is, who would receive the GBI, how much would they receive, and how would the benefit be impacted by other income? The five types are summarized in Table 4.2.

**Table 4.1***Summary of Included Experiments*

Experiment name	Short name	Country	Period	Included studies (primary sources)	Other sources (pre-analysis plans, conference proceedings, final reports, books, etc.)
Barcelona B-MINCOME Pilot	B-Mincome	Spain	2017-2019	Bonilla 2019 Todeschini 2019	Lain 2019
Canada public pension study		Canada	2007-2013	McIntyre 2016a	McIntyre 2016b
Dutch participation income experiments		Netherlands	2017-2019	Muffels 2021	Muffels & Gielens 2019
Finnish basic income experiment		Finland	2017-2018	Lassander 2021 Simanainen 2021	Kangas 2021
Gary Income Maintenance Experiment	Gary	USA	1971-1974	Kaluzny 1979 Kehrer 1979 Maynard 1979 McDonald 1979	Kehrer et al. 1979 Long 1972 Munnell 1986
Manitoba Basic Annual Income Experiment	Mincome	Canada	1974-1978	Calnitsky 2019 Calnitsky 2021 Forget 2011, 2013 Gonalons- Pons 2021	Hum 1979a Hum 1979b Simpson 2017
New Jersey Income-Maintenance Experiment	New Jersey	USA	1968-1972	Elesh 1977 Kerachsky 1977 Ladinsky 1977 Mallar 1977 Middleton 1977 Nicholson 1977	Kershaw 1976, Long 1972 Munnell 1986
Rural Income Maintenance Experiment	RIME or Rural	USA	1970-1973	Maynard 1977 O'Connor 1979	Bawden 1976 Long 1972 Munnell 1986
Seattle-Denver Income Maintenance Experiment	SIME/DIME	USA	1971-1976	Groeneveld 1979 Manheim 1979 Thoits 1979 Venti 1984	Bell 1979 Long 1972 Munnell 1986 SRI International 1983
Stockton Economic Empowerment Demonstration	SEED	USA	2019-2020	West 2021	Martin-West 2019

The first type of GBI in Table 4.2 is the basic conceptual version: people with incomes below some threshold receiving a subsistence-level, fixed amount. This approach resembles a livable-wage (or 'full') universal basic income (UBI), except that the GBI version would have an income cut-off threshold so that people with median or high incomes would not be eligible to receive benefits. Also, while UBI is usually conceptualized as an individual-level citizens' wage, the subsistence-level GBI could also be implemented at the household level, based on the number and ages of the members of the household. The net annual amount would be determined when income tax returns are filed, such that recipients with incomes above their tax liability threshold would have to repay some of the GBI amount. This would avoid a potential problem with the negative income tax (NIT) approach that would occur where the NIT amount and eligibility are based on the previous year's income but where a person's current-year income is much lower than the year before.

We did not find any experiments on this type of GBI in high-income countries but have included it in our framework as a conceptual and potentially operationalizable approach. In fact, there have been recent proposals for basic income pilots which could be classified as the subsistence-level, fixed-amount type of GBI: one in England and one in Wales (the latter now underway), both providing unconditional monthly payments of £1,600 for each participant (Sheils McNamee, 2023).

The second type of GBI in our framework provides a fixed amount well below a subsistence level, but which supplements all other income, including earned income and social assistance benefits. This type is similar to the 'partial' universal basic income (UBI) proposal, except that it would be provided only to people with low incomes. This approach would help to alleviate financial hardship due to insufficient social assistance benefits, as well as in-work poverty for those with precarious, intermittent and/or low-paying jobs. Two of the included experiments

tested this approach: the Finnish basic income experiment and the Stockton Economic Empowerment Demonstration (SEED).

The third type of GBI is a guaranteed minimum income (GMI) approach, which provides a top-up amount to anyone whose income falls below an amount that is calculated as the cost of basic material needs. If the recipient's income rises, then the amount of the benefit is reduced dollar-for-dollar (i.e., a 100% withdrawal rate with additional income). This approach is similar to traditional social assistance programs, which also impose a 100% withdrawal rate, so there is little financial incentive to find low-paying work, resulting in a poverty 'trap' (Standing 2021). This problem is more prevalent in high-income countries where social assistance levels are more generous than in less developed countries (Konle-Seidl 2021).

The term GMI is also used for existing social assistance programs with a 100% withdrawal rate; the only difference with the GBI variant is that the benefits are not conditional on seeking employment, training, or other required activities. Therefore, although this variant meets our criteria of being unconditional and paid in regular, predictable amounts, we classified the GMI approach as a 'quasi-UBI' due to the austere nature of benefit withdrawal. If, for example, someone earns 90% of the GMI threshold through paid work and receives 10% as the top-up, this amount does not meet the core definition of GBI as either providing a subsistence-level income or a fixed base which can be supplemented with other income (Hoynes and Rothstein 2019).

The fourth type of GBI also provides a guaranteed minimum income (GMI) based on an estimate of living costs, but incorporates a gradual withdrawal of benefits as earned income increases. This approach is also used in novel social assistance programs in many European countries (Coady et al., 2021), but still in the conditional form. Unconditional GMI with partial withdrawal of benefits is similar to the fifth GBI type, negative income tax (NIT), where benefits are also reduced gradually with increased income; however, the guaranteed amount with NIT is

not based on the estimated cost of basic needs, but is determined by the tax rate and the breakeven amount, as described above. Both GMI with partial withdrawal and NIT can be considered as providing an income base which can be supplemented with other income. The benefit amount drops below subsistence level when other income is earned, but the amount is still substantial until total income gets close to the (much larger) breakeven amount.

**Table 4.2***Types of Guaranteed Basic Income Approaches*

GBI type	Benefit structure	Integration with social assistance	Effect of earned/other income <sup>1</sup>	Allocation level	Other properties	Experiments
Subsistence-level fixed amount	Fixed amount for all recipients, equal to the estimated cost of basic material needs.	Replaces basic social assistance benefits. <sup>2</sup>	No reduction in the benefit amount.	Household or individual	Similar to a subsistence-level UBI, but income-tested to provide benefits only to people with low incomes.	(None)
Supplemental fixed amount	Fixed amount for all recipients; amount below subsistence level.	Supplements social assistance benefits (and other income).	No reduction in the benefit amount.	Individual	Similar to a 'partial' UBI, but income-tested to provide support to people with low incomes.	Finland, SEED (US)
Guaranteed minimum income (GMI) <sup>3</sup>	Benefit amount is a 'top-up' added to earned income, so total income covers the estimated cost of basic material needs.	Replaces basic social assistance benefits. <sup>2</sup>	Increase in earned income results in proportional (dollar-for-dollar) reduction in benefit amount; fully withdrawn when earned income equals or exceeds the GMI guaranteed amount.	Household	Also called "income insurance"; similar to traditional social assistance programs, but not conditional on job seeking or other required activities.  A quasi-GBI because of the 100% withdrawal rate.	B-Mincome (unconditional + full-withdrawal study arm), Netherlands (5 of 8 sites: Groningen, Utrecht, Wageningen, Oss, Apeldoorn-Epe)
Guaranteed minimum income (GMI) <sup>3</sup> with partial withdrawal	Benefit amount is added to earned income (a 'top-up'), so total income covers or exceeds estimated cost of basic material needs.	Replaces basic social assistance benefits. <sup>2</sup>	Benefit is gradually reduced by a set percentage of additional earned income, up to a set cut-off point.	Household	Similar to modern/novel social assistance programs (with some allowance for earned/other income), but not conditional on job seeking or participation in specific programs or activities.	B-Mincome (unconditional + partial withdrawal study arm), Netherlands (3 of 8 sites: Deventer, Nijmegen, Tilburg)
Negative income tax (NIT)	Guaranteed, fixed benefit amount (with no other income); reduced by a percentage of earned/other income (depending on the NIT 'tax' rate).	Replaces basic social assistance benefits. <sup>2</sup>	Benefit is gradually reduced by a percentage of additional earned income, up to a break-even point where the benefit amount becomes zero (and earned income is well above the NIT guarantee minimum).	Household	Similar to GMI with partial withdrawal, but the guaranteed amount is not based on a calculation of the cost of basic living expenses. The guaranteed amount is either arbitrary or a percentage of the official poverty line, usually 50%, 75% or 100%; various 'generosity' levels have been tested in experiments.	Canada public pension, Gary (US), Mincome (Canada), New Jersey (US), Rural/RIME (US), SIME/DIME (US)

<sup>1</sup> All types of GBI are subject to regular income taxes if a person's total income exceeds their individual tax liability threshold.

<sup>2</sup> Does not replace programs for specific needs, such as disability benefits or healthcare coverage.

<sup>3</sup> Some existing social assistance programs are also called guaranteed minimum income (GMI), but eligibility is conditional on job seeking, training, counseling, and/or other required activities.

### *Included studies*

The studies that were eligible for inclusion in this review are summarized in Table 4.3. The studies are grouped by each of the ten experiments because the design and intervention details are features of the 'experiment' level, whereas participant details and outcomes are features of the 'study' level. This required a departure from the standard PICO (participants, intervention, comparator, outcomes) format for our 'Characteristics of included studies' table.

Six of the ten experiments provided negative income tax (NIT) interventions, which varied within and between experiments in the guaranteed amount and the 'tax' (withdrawal) rate on benefits if other income was received. These experiments were analyzed in 21 included studies. The NIT configurations ranged in generosity from a guarantee of 50% up to 140% of the poverty line, with withdrawal rates ranging from 30% to 75%. The withdrawal rates with the less generous guarantees were limited to 50% or less, so that none of the NIT configurations had a low guaranteed amount combined with a high withdrawal rate. The New Jersey experiment originally included one such arm, but it was removed because of very high attrition, and the remaining participants were reallocated to a more generous NIT arm (Kershaw and Fair, 1976b). The withdrawal rate of the Canada public pension varied with income (McIntyre 2016), so we could not report a specific rate.

Three of the included studies reported on two experiments which provided a guaranteed minimum income (GMI), either with full withdrawal or partial withdrawal. Another three studies reported on two other experiments which provided a supplemental GBI as the intervention.

We excluded 15 studies, listed in Appendix 6, which reported only outcomes that were ambiguous in their effect on poverty. Three other studies shown in this appendix were excluded following deliberations between the reviewers about the study designs and reaching consensus that the designs did not meet our inclusion criterion.

**Table 4.3***Characteristics of Included Studies*

Experiment	Intervention	Methods	Study ID (article type)	Participants <sup>1</sup>	Outcomes
B-MINCOME Pilot Besòs area of Barcelona, Spain	7 arms/variants of GBI: 2 with full (dollar-for-dollar) withdrawal with additional income (GMI type), 5 with partial (25% to 35%) benefit withdrawal with additional income (NIT with partial withdrawal); guaranteed amount calculated to cover basic material needs  3 arms excluded due to conditions for receipt of benefits	RCT with block randomization (based on expected benefit amount, eligibility for work, and homeownership); allocation by household.  Duration: 22 months (2017-2019)	Bonilla 2019 (published report)	Low-income families with at least one member aged 25 to 60  (N = 1,320)	Life satisfaction (self-rated)  Measured at: baseline, 11/12 months, 21/22 months
			Todeschini 2019 (published report)	Low-income families with at least one member aged 25-60  (N = 1,383)	44 outcome variables: 20 economic, 3 educational, 4 mental/psychological, 7 physical health, 10 other (see Appendix 7 for detailed list of all outcomes)  Measured at: baseline, 11/12 months, 21 months
Canada public pension study Canada	Public pension paid at age 65+ (a basic universal amount, plus a supplement that is reduced as other income increases - NIT type); maximum benefit equals 80% of poverty line	Repeated cross-sectional design; data from the Canadian Community Health Survey (CCHS) (2007 to 2013); individual-level data	McIntyre 2016a (journal article)	Single low-income (<\$20,000/year) Canadians, ages 55-74  (N = 8,019)	Food insecurity (self-reported) measured using the Household Food Security Survey Module (HFSSM)  Measured at: 2007–2008, 2009–2010, 2011–2012, and 2013
Dutch participation income experiments 8 cities in the Netherlands	8 arms: 3 sites (cities of Deventer, Nijmegen, Tilburg) with 50% benefit reduction rate with earnings (GMI with partial withdrawal), 5 sites (cities of Groningen, Utrecht, Wageningen, Oss, Apeldoorn-Epe) with full withdrawal (GMI type); additional arms at each site with conditional benefits were excluded; basic benefit equal to 70% of the full-time minimum wage	RCT; randomization of the target population before recruitment in two sites (Groningen and Deventer); individual-level allocation  Duration: 24 months (2017-2019)	Muffels 2021 (published report)	Social assistance recipients, not receiving disability benefit or retirement pension, ages vary by site, max. range 15-65  (N = 5,230)	Financial stress and poverty, mental health, physical health, subjective well-being, perceived capabilities, social participation, social trust; all outcomes self-reported  Measured at: baseline, 16-24 months

<sup>1</sup> 'N' denotes the total sample size in each study.

Experiment	Intervention	Methods	Study ID (article type)	Participants <sup>1</sup>	Outcomes
Finnish basic income experiment Finland	€560 paid monthly regardless of earned income; replaced all social assistance benefits, amount matched if pre-experimental benefits totaled more than €560	RCT; individual-level allocation Duration: 12 months (2017-2018)	Lassander 2021 (book chapter)	Recipients of social assistance, unemployment benefits or labor market subsidies, aged 25-58 (N = 1,633)	Subjective financial well-being (self-rated) Measured at: 12 months
			Simanainen 2021 (book chapter)	Recipients of social assistance, unemployment benefits or labor market subsidies, aged 25-58 (N = 1,633)	19 outcome variables: 13 mental/psychological, 6 physical health (see Appendix 7 for detailed list of all outcomes) Measured at: 12 months
Gary Income Maintenance Experiment Gary, Indiana, USA	NIT with four configurations/combinations of a guarantee (approx. 77% or 100% of poverty line), and withdrawal rate of 40% or 60%	RCT; stratified by pre-experimental income level; allocation by household Duration: 3 years (1971-1974)	Kaluzny 1979 (journal article)	Black families with at least one child under age 18 (N = 1,780)	Probability of becoming a homeowner, rental expenditure (source of data not reported) Measured at: baseline, 1 year, 2 years, 3 years
			Kehrer 1979 (journal article)	Infant children from Black families (N = 404)	Birth weight (from government records) Measured at: birth during the experiment
			Maynard 1979 (journal article)	Children in grades 4-10 from Black families (N not reported; total observations over 3 years: 851 to 1,517 depending on outcome)	Reading test score, academic grade point average, days absent (source of data not reported) Measured at: baseline, 1 year, 2 years, 3 years
			McDonald 1979 (journal article)	Children aged 16-18 from Black families (N = 266)	Post-mandatory school enrollment (self-reported)

Experiment	Intervention	Methods	Study ID (article type)	Participants <sup>1</sup>	Outcomes
					Measured at: baseline, 2nd school year during experiment
Manitoba Basic Annual Income Experiment (MINCOME) Province of Manitoba, Canada	Winnipeg (city) site - NIT with seven configurations/combinations of a guarantee (approx. 55%, 67% or 78% of poverty line) and withdrawal rate (35%, 50% or 75%): i.e., 55/35, 55/50, 67/35, 67/50, 67/75, 78/50 and 78/75	RCT; stratified by family structure (one or two parents, one or both working) and by pre-experimental income level; allocation by household  Duration: 4 years (1974-1978)	Calnitsky 2019 (journal article)	Adults from low-income families in Winnipeg (N = 926)	Reason for not working (self-reported)  Measured at: baseline, 11 survey waves over 4 years
	Dauphin, Manitoba 'saturation' site - NIT with one configuration: guarantee of approx. 60% of the poverty line and withdrawal rate of 50%	Retrospective CBA study with matched controls outside Dauphin (in which all low-income residents were eligible for the intervention)  Duration: 4 years (1974-1978)	Calnitsky 2021 (journal article)	Towns in Manitoba and Saskatchewan (provinces in Canada) with populations between 5,000 and 50,000; Dauphin intervention site pop. = ~12,500 (N = 15)	Overall crime rates, violent crime rates, property crime rates, other crime rates (from Uniform Crime Report (UCR) records)  Measured at: yearly from 1972-1980
			Forget 2011, 2013 (journal articles)	Residents of Dauphin and matched controls from other towns in Manitoba (N = ~50,000, based on 3 matched controls for each Dauphin resident)	Hospital separations (reported by all causes, non-congenital mental health, accidents/injuries), low birth weight, at-risk birth weight, small-for-gestational age - newborns (data from Manitoba Population Health Research Data Repository), grade 11/12 enrolment (data from Department of Education)  Measured at: 32 six-month intervals from 1970-85
	Winnipeg and Dauphin sites (as described above)	As described above for both sites	Gonalons-Pons 2021 (journal article)	Low-income, married couples in Manitoba (N = 641)	Frequency of divorce talk, temporary separation by wife, marital financial disagreement, marital non-financial disagreement, wife's bargaining

Experiment	Intervention	Methods	Study ID (article type)	Participants <sup>1</sup>	Outcomes
					and decision-making power (all self-reported) Measured at: baseline, 2 years
New Jersey Income-Maintenance Experiment 3 cities in New Jersey (Trenton, Paterson-Passaic, and Jersey City) and 1 city in Pennsylvania (Scranton), USA	NIT with eight configurations/combinations of a guarantee (50%, 75%, 100% or 125% of the poverty line) and withdrawal rate (30%, 50% or 70%): i.e., 50/30, 50/50, 75/30, 75/50, 75/70, 100/50, 100/70 and 125/50	RCT; stratified by pre-experimental income level; allocation by household.  Duration: 4 years (1968-1972)	Elesh 1977 (journal article)	Low-income, husband-wife families with one or more dependants (N = 732)	Number of hospital days, number of chronic illnesses (both reported separately for husband, wife, children), number of work days lost (husband, wife), number of days in bed (children) Measured at: 6 months, 1.5 years, 2.5 years for parents; 6 months, 2 years for children
			Kerachsky 1977 (book chapter)	Adult males and females from low-income, husband-wife families (N = 1,293)	Number of times entered hospital, illness lasting more than 3 months, illness interfering with work (all reported separately for men and women), illness preventing work (men only) Measured at: 6 months, 1.5 years, 2.5 years
			Ladinsky 1977 (book chapter)	Low-income husband-wife families, male heads, husband-wife families with children (depending on outcome) (N = 1001)	Home improvements, appliance and car purchases; social integration and recreation (10 variables described in Appendix 7) Measured at: baseline, quarterly up to 3 years depending on outcome
			Mallar 1977 (book chapter)	Youths from working poor families with both parents present (N = 138)	High school completion, years of schooling attained Measured at: 3 years
			Middleton 1977	Low-income male household heads	15 outcome variables on "social psychological effects" (see Appendix 7 for details)

Experiment	Intervention	Methods	Study ID (article type)	Participants <sup>1</sup>	Outcomes
			(book chapter)	(N = 1166)	Measured at: baseline, 1-3 years depending on outcome
			Nicholson 1977 (book chapter)	Low-income families (N = 586)	16 economic outcome variables (see Appendix 7 for details) Measured at: baseline, 1.5-2 years depending on outcome
Rural Income Maintenance Experiment (RIME) States of Iowa and North Carolina, USA	NIT with five configurations/combinations of a guarantee (50%, 75% or 100% of the poverty line) and withdrawal rate (30%, 50% or 70%): i.e., 50/50, 75/30, 75/50, 75/70 and 100/50	RCT; allocation by household Duration: 3 years (1970-1973)	Maynard 1977 (journal article)	Children in grades 2 to 12 from low-income rural families (N = 847)	Absenteeism, comportment, academic grade point average, standardized achievement test score (percentile and deviation from expected grade equivalent) Measured at: unknown <sup>2</sup>
			O'Connor 1979 (journal article)	Low-income rural families (N = 612)	Quality of dietary intake Measured at: quarter 3, quarter 11 (2 years apart)
Seattle-Denver Income Maintenance Experiment (SIME/DIME) Cities of Seattle and Denver, USA	NIT with eleven configurations/combinations of a guarantee (95%, 120% or 140% of the poverty line) and withdrawal rate (50%, 70%, 70% declining <sup>3</sup> or 80% declining <sup>3</sup> ): i.e., 95/50, 95/70, 95/70d, 95/80d, 120/50, 120/70, 120/70d, 120/80d, 140/50, 140/70 and 140/80d	RCT; stratified by income, race/ethnicity, and (in Denver only) marital status; allocation by household. Duration: 3-5 years <sup>4</sup> (1971-1976)	Groeneveld 1979 (published report)	White and Black youths, aged 9 to 13 at enrollment (N = 1,411)	Delinquency (contacts with police for status offenses and for serious offenses) Measured at: baseline, 5-6 years
			Manheim 1979 (conference proceeding - included report)	Children in grades 2-10 at enrollment (N = 765)	Grade point average, standardized test score, school absences Measured at: baseline, 2 years, 4 years
			Thoits 1979 (journal article)	Adult heads of households (N = approx. 7,500)	Psychological distress score (self-reported) based on adapted Macmillan Health Opinion Survey

<sup>2</sup> Timing of outcome measurement is reported as “at the time of the most recent observations on any school performance measure” (Maynard 1977, p. 371).

<sup>3</sup> The Seattle-Denver Income Maintenance Experiment also tested variable withdrawal rates that started at either 70% or 80% and declined by 2.5% for every \$1,000 of earned income (1970s USD).

<sup>4</sup> The Seattle-Denver Income Maintenance Experiment enrolled participants in either a 3-year or 5-year plan. A small sample (4%) was also enrolled in a 20-year plan, but the experiment was canceled in 1982.

Experiment	Intervention	Methods	Study ID (article type)	Participants <sup>1</sup>	Outcomes
					Measured at: 4/8 months, 20/24 months (males/females)
			Venti 1984 (journal article)	Youths aged 16-21 during the first three years of the experiment (N not reported; total of 4604 observations from 3 time points)	Probability of post-mandatory schooling (self-reported) Measured at: 5 months, 17 months, 29 months
Stockton Economic Empowerment Demonstration (SEED) City of Stockton, California, USA	USD500 per month regardless of other income (including social assistance benefits)	RCT; allocation by individual; mixed methods with surveys for quantitative analysis and interviews for qualitative. Duration: 12 months (2019-2020)	West 2021 (published report)	Residents of Stockton, California in a neighborhood with a median income of \$46,033 or less, aged 18+ (N = 325)	14 outcome variables: 4 economic, 3 mental/psychological, 6 physical health, 1 other (see Appendix 7 for detailed list of all outcomes) Measured at: baseline, 6 months, 12 months

**Comparators.** The participants in the control groups of all the included studies did not receive the intervention but could receive social assistance benefits if they met the eligibility requirements. As such, the control groups of the included studies received 'usual care'.

**Funding.** For most of the included studies, the funding was provided differently for the experimental stage (design, recruitment, intervention, data collection) and the study stage (analysis and reporting).

All of the included experiments were funded by governments (federal, provincial, state, or municipal), except the Stockton (SEED) experiment, which was funded by private donors and philanthropic organizations (Stockton Economic Empowerment Demonstration, 2019).

All of the included studies were supported by grants from governments or public research institutions, except the SEED study (West 2021), which was funded by the Robert Wood Johnson Foundation.

### ***Risk of bias in included studies***

The risk of bias was assessed as moderate or high for most of the included studies. Figure 4.3 depicts a visual summary of the assessments. The overall rating in the third column uses a colour-coding scheme to visually represent the overall risk for each study. Although the thresholds for the colour-coding are arbitrary (overall score of 7-9 in green, 10-12 in yellow, 13-15 in orange, 16-21 in red), there is consistency in high-risk ratings for the older U.S. NIT experiments (Gary, New Jersey, RIME, and SIME/DIME), even though the risk assessments were conducted by different pairs of reviewers (from a total of fourteen). Much of the high risk for these older studies is attributable to incomplete reporting of the methods used, with articles focusing on analysis methods and discussion of the results.

There were high rates of attrition in all of the experiments except the Canada pension study, which contributed to judgments of high risk in 21 studies for the attrition domain.

The assessed risk for the analysis domain was high for 22 of the studies, usually due to the unavailability of a pre-analysis plan. This was typical where the 'experiment' stage (from design to data collection) and the 'study' stage (statistical analysis and reporting of results) were conducted by different research teams. Of the recent experiments (from the past decade), we located the pre-analysis plan for the SEED experiment (Stockton Economic Empowerment Demonstration, 2019); however, specific methods and statistical details were lacking in the interim first-year report (West 2021) that was included in this review. We also located the pre-analysis plan for the Finnish experiment (<https://www.socialscisceregistry.org/trials/2095>), but it only referred to the analysis of administrative data (for employment outcomes) and not the survey data that we examined in this review.

Studies that used data from administrative sources (health departments, school boards, police records, etc.) tended to have better risk of bias ratings than those that analyzed survey data obtained in interviews with participants. High rates of attrition resulted in 'some concerns' and 'high risk' ratings for all the studies except McIntyre 2016a (Canada public pension) which used a repeated cross-sectional design, so participant retention after recruitment was not a concern.

We did not assess the risk of bias by outcome, which takes into consideration that some measures of treatment effect are more subjective than others. This was a methodological oversight on our part. However, all of the included studies that reported both objective and subjective (self-reported) outcomes were assessed as having a high risk of bias in domains other than 'measurement error'; thus, our interpretations of the findings would not have been different if we had conducted the risk of bias assessments by outcome.

Figure 4.3.

*Risk of Bias Summary*

Study	Experiment	Overall rating (out of 21)	Confounding	Selection	Attrition	Motivation	Implementation	Measurement	Analysis
Todeschini 2019	B-Mincome (Barcelona)	14	Low risk	Low risk	Some concerns	Some concerns	Some concerns	High risk	High risk
Bonilla 2019	B-Mincome (Barcelona)	15	Some concerns	Some concerns	High risk	Some concerns	Some concerns	Some concerns	Some concerns
McIntyre 2016a	Canada public pension	8	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Some concerns
Muffels 2021	Dutch (Netherlands)	11	Low risk	Some concerns	Some concerns	Low risk	Some concerns	Low risk	Some concerns
Lassander 2021	Finnish BI Experiment	15	Some concerns	Some concerns	High risk	High risk	Low risk	Some concerns	Some concerns
Simanainen 2021	Finnish BI Experiment	15	Some concerns	Some concerns	High risk	High risk	Low risk	Some concerns	Some concerns
Kehrer 1979	Gary, USA	17	High risk	High risk	High risk	Some concerns	Some concerns	Low risk	High risk
Kaluzny 1979	Gary, USA	19	High risk	High risk	High risk	Some concerns	Some concerns	High risk	High risk
Maynard 1979	Gary, USA	19	High risk	High risk	High risk	High risk	Some concerns	Some concerns	High risk
McDonald 1979	Gary, USA	20	High risk	High risk	High risk	High risk	Some concerns	High risk	High risk
Calnitsky 2019	Mincome (Canada)	11	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Calnitsky 2021	Mincome (Canada)	11	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Forget 2011	Mincome (Canada)	11	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Forget 2013	Mincome (Canada)	11	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	High risk
Gonalons-Pons 2021	Mincome (Canada)	12	Low risk	Low risk	High risk	Low risk	Low risk	Some concerns	High risk
Middleton 1977	New Jersey, USA	19	High risk	Some concerns	High risk	High risk	Some concerns	High risk	High risk
Elesh 1977	New Jersey, USA	20	High risk	High risk	High risk	High risk	Some concerns	High risk	High risk
Kerachsky 1977	New Jersey, USA	20	High risk	High risk	High risk	High risk	Some concerns	High risk	High risk
Ladinsky 1977	New Jersey, USA	20	High risk	High risk	High risk	High risk	Some concerns	High risk	High risk
Mallar 1977	New Jersey, USA	20	High risk	High risk	High risk	High risk	Some concerns	High risk	High risk
Nicholson 1977	New Jersey, USA	20	High risk	High risk	High risk	High risk	Some concerns	High risk	High risk
Maynard 1977	RIME, USA	16	Some concerns	High risk	Some concerns	Some concerns	Some concerns	Some concerns	High risk
O'Connor 1979	RIME, USA	18	High risk	High risk	High risk	Some concerns	Some concerns	Some concerns	High risk
Groeneveld 1979	SIME-DIME, USA	14	High risk	Some concerns	Some concerns	Low risk	Some concerns	Low risk	High risk
Manheim 1979	SIME-DIME, USA	16	Some concerns	High risk	High risk	Some concerns	Low risk	Some concerns	High risk
Thoits 1979	SIME-DIME, USA	16	High risk	Some concerns	High risk	Some concerns	Some concerns	Low risk	High risk
Venti 1984	SIME-DIME, USA	16	High risk	Some concerns	Some concerns	Low risk	Some concerns	High risk	High risk
West 2021	SEED, USA	16	High risk	High risk	High risk	Low risk	Some concerns	Low risk	High risk

## *Synthesis of results*

As anticipated, the diversity of intervention types and reported outcomes limited our ability to conduct a comprehensive quantitative synthesis. Therefore, the results are presented in tabular form by outcome category, along with meta-analyses of specific outcomes which were reported in two or more studies.

Each of the results tables presents the statistically significant results (with  $p < 0.05$ ) for the main study sample, as well as those reported for any subgroups that we could categorize according to the PROGRESS-Plus framework, that would allow us to investigate equity-related differences in intervention effects.

For some outcomes, as shown in the results tables, the magnitude of the effect estimate was unclear because point estimates were not reported and there was insufficient data provided to calculate them. In these cases, only  $p$ -values were available to indicate 'significant' findings.

Although we present summaries of statistically significant and non-significant results below using a significance level threshold of 5%, it's important to note that any apparent lack of effect may actually reflect a lack of evidence rather than a conclusive finding of no effect. For example, if the  $p$ -value is 0.15 for a particular result, this may be weak evidence of a true effect.

**Classification of outcomes.** The included studies reported on only one of the two primary outcomes: food insecurity. The second primary outcome, poverty level assessed using official, national, or international measures, was not reported in any of the included studies.

Outcomes were categorized during the data extraction stage as one of the following: economic/material, physical health, mental/psychological health, education/training, and 'other'. Food insecurity was considered an economic outcome (by its definition), but we examine it below as a separate category. As well, the outcomes that were originally categorized as 'other' were found to belong to two distinct categories: social outcomes, and individual choice/agency

outcomes. Therefore, we have summarized the study findings according to these seven categories in separate tables below (Table 4.5, Table 4.6, Table 4.7, Table 4.8, Table 4.9, Table 4.10, and Table 4.11).

The large number of outcome variables in each category (other than food insecurity) were grouped into subcategories, as shown in the results tables below, to help identify and match similar outcomes for potential meta-analyses.

There was a total of 176 outcome variables (see Appendix 7) that were reported in the included studies: three in the food insecurity category, 38 were economic/material, 33 were on physical health, 39 were on psychological/mental health, 22 were social outcomes, 17 were educational, and 24 were on individual choice and agency. These outcomes met our inclusion criteria for poverty-related outcomes that were not ambiguous in the direction of the effect on poverty (e.g., "number of physician visits" was excluded because it was unclear if more visits meant worse health or prioritizing one's health and being able to afford the time and expense to visit a physician). A total of 56 outcome variables were excluded (Appendix 8) as either not poverty-related (e.g., probability of moving) or ambiguous in their effect on poverty (e.g., marital dissolution).

We categorized the 176 included outcomes into 34 subcategories: one for food insecurity, six for economic/material, nine for physical health, seven for psychological/mental health, three for social, five for educational, and three for individual choice and agency. The outcomes within each of the 34 subcategories were then assessed to see which could be combined in meta-analyses.

**Consideration of equity-relevant factors in included studies.** A summary of the PROGRESS-Plus factors that were examined in subgroup analyses in the included studies is provided in Table 4.4. Out of the 27 included studies, 18 conducted subgroup analyses across

one or more PROGRESS-Plus categories. The following factors belonging to the 'Plus' category were considered in at least one study: age, marital status, smoking/non-smoking, and police record. Nine of the studies did not report any subgroup analyses by factors in the PROGRESS-Plus framework.

Intervention effects by race or ethnicity were examined in six studies. We report the original terminology as used by the study authors, even though some of the terms from the older studies may be outdated (for example, 'Chicano' instead of Mexican American).

**Table 4.4***PROGRESS-Plus Factors Examined in Subgroup Analyses in Included Studies*

Study/ Experiment	Place of residence	Race, ethnicity, or ancestry	Occupation	Gender or sex	Religion	Education	Social capital	Socioeconomic position (SEP)	Plus factors
Bonilla 2019 B-Mincome (Barcelona)		EU vs. non- EU ethno- cultural background		Male, female		Education level	Amount of participation groups, support network	Income decile, material deprivation, food deprivation, bad house conditions	Age, marital status (married, single, divorced, separated, widowed)
McIntyre 2016a  Canada public pension	Urban, rural			Male, female				Income level, home ownership	
Kehrer 1979 Gary, USA									Age (<18, 18- 34, >34); smoking, non- smoking
Maynard 1979 Gary, USA								Pre-enrollment family income (above or below half of poverty line)	
McDonald 1979 Gary, USA				Male, female				Family income above or below NIT breakeven point	
Calnitsky 2019				Male, female					Age (<26, 26- 49, >49)

Study/ Experiment	Place of residence	Race, ethnicity, or ancestry	Occupation	Gender or sex	Religion	Education	Social capital	Socioeconomic position (SEP)	Plus factors
Mincome (Canada)									
Calnitsky 2021 Mincome (Canada)						Percent of population with any post- secondary education		Population average family income	Age (percent of population between 20 and 24)
Gonalons- Pons 2021 Mincome (Canada)	Dauphin (small town/rural), Winnipeg (city)								
Elesh 1977 New Jersey, USA				Male, female					
Kerachsky 1977 New Jersey, USA				Male, female					
Ladinsky 1977 New Jersey, USA	4 sites (3 cities in New Jersey, 1 city in Pennsylvania)	Black, Spanish- speaking, white	"Occupational prestige" (Duncan socioeconomic index)	Husbands, wives		"Education" (not defined)		Home-ownership; family earnings	Age of adults
Nicholson 1977 New Jersey, USA		Black, Spanish- speaking, white						Renter, homeowner	

Study/ Experiment	Place of residence	Race, ethnicity, or ancestry	Occupation	Gender or sex	Religion	Education	Social capital	Socioeconomic position (SEP)	Plus factors
Maynard 1977 RIME, USA	Iowa, North Carolina								
O'Connor 1979 RIME, USA	Iowa, North Carolina								Age of family head (<31, 31- 50, 51-64)
Groeneveld 1979 SIME-DIME, USA	Denver, Seattle; change of residence	Black, white		Male, female				Family income	Police record; parent or sibling with police record; age (9-13 at baseline)
Manheim 1979 SIME-DIME, USA	Denver, Seattle							Change in income due to the experiment	
Thoits 1979 SIME-DIME, USA	Denver, Seattle	Black, Chicano, white		Male, female					Marital status (married, single)
Venti 1984 SIME-DIME, USA	Denver, Seattle	Black, white		Male, female					Age (16, 17, 18, 19, 20, 21)

## Results for primary outcomes

**Food insecurity.** Food insecurity outcomes were reported in only two of the included studies: McIntyre 2016a (Canada public pension) and Todeschini 2019 (B-Mincome). As shown in Table 4.5, both studies found large reductions in food insecurity. The Canada public pension study looked at low-income single people aged 55 and up, and found a 54% reduction in food insecurity after they started to receive the public pension at the age of 65. For the B- Mincome study, we only included arms that met our GBI criteria, so the conditional benefit arms were excluded.

**Table 4.5**

### *Results for Food Insecurity Outcomes*

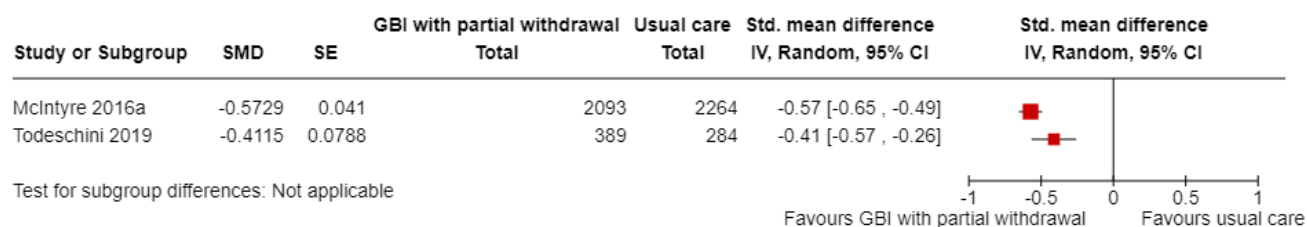
Study	Outcome	Study findings	
		Full study sample	By PROGRESS-Plus factor (for which evidence of effect was reported)
McIntyre 2016a	Prevalence of food insecurity	Decrease of 54% (calculated $d = -0.573$ , 95% CI: -0.653 to -0.493)	<i>Gender/sex</i> : 4.0% lower for male than female ( $p < 0.05$ )  <i>SEP</i> : 10.4% to 14.1% lower for mid and upper low-income than lowest low-income bracket, $p < 0.05$ ; decrease with home ownership (11.3% less, $p < 0.05$ )
Todeschini 2019	Food insecurity	Decreased probability of 22.4% ( $p < 0.05$ ) for all unconditional arms combined, decrease of 26.4% ( $p < 0.05$ ) for unconditional with full withdrawal (GMI type), decrease of 19.9% ( $p < 0.05$ ) for unconditional with partial withdrawal, decrease of 29.9% ( $p < 0.01$ ) for unconditional without activation policy	
	Going to bed hungry	Decreased probability of 12.0% ( $p < 0.05$ ) for all unconditional arms combined, 13.8% ( $p < 0.05$ ) for unconditional with full withdrawal (GMI type), 16.3% ( $p < 0.05$ ) for unconditional without activation policy option	

Food insecurity was also measured in the Ontario Basic Income Pilot (OBIP), conducted in Canada in 2018–2019. However, the two studies that we found on this experiment (McDowell 2020, McDowell 2021) were excluded because of the study design. We initially included the OBIP studies as using cohort designs with historical data collected at one timepoint (Parker & Berman, 2016); however, consensus was later reached among three reviewers (AR, LI, MMK) that both studies employed an ineligible cross-sectional design with one time-point. The OBIP pilot was cancelled prematurely after a new government came into power, so follow-up data was not collected by the pilot project's evaluation team.

The Canada public pension program uses a negative income tax approach, such that the benefit amount starts out at approximately 80% of the poverty line if there is no other income, and then is gradually reduced as other income increases. The B-Mincome experiment included several different intervention arms, one of which provided an unconditional guaranteed amount to cover the cost of basic needs, which was gradually reduced as income increased (i.e., GMI with partial withdrawal). Figure 4.4 shows a visual representation of the effect estimates of these two similar interventions. We did not calculate a pooled estimate because the interventions, populations, and study designs were different. McIntyre 2016a examined food insecurity for single Canadians aged 55 and up (around the public pension eligibility age of 65), and B-Mincome targeted households in low-income neighborhoods in Barcelona.

**Figure 4.4.**

*Effect of GBI with Partial Withdrawal on Food Insecurity*



**Poverty level assessed using official and international measures.** None of the included studies used instruments or indexes such as official national poverty measures, consumption indicators such as the Household Budget Survey (HBS) and Consumer Expenditure (CE) Survey, or measures of deprivation such as the European Union's Material Deprivation (MD) Index. Individual components of these measures, such as food expenditure or housing quality, were included as secondary outcomes.

### **Results for secondary outcomes**

#### ***Economic and material outcomes***

The outcomes in this category are summarized in Table 4.6. The individual outcomes were grouped into six subcategories as outlined in the subsequent paragraphs.

##### **Financial Hardship:**

A single study examined outcomes related to financial hardship (Todeschini 2019, B-Mincome). Across all unconditional study arms, the probability of borrowing money from family or friends decreased by 7.3% ( $p < 0.05$ ) with the unconditional partial withdrawal arm demonstrating results of a similar magnitude (7.5%,  $p < 0.05$ ). Only the unconditional no activation study arm reported a significant decrease (20.5%,  $p < 0.05$ ) in the likelihood of falling behind on mortgage or rent payments.

##### **Material Deprivation:**

Only Todeschini 2019 (B-Mincome) examined outcomes within this subcategory. The probability of severe material deprivation in the unconditional study arms decreased by 7.6% ( $p < 0.05$ ). The unconditional full withdrawal arm (9.0%,  $p < 0.05$ ) and the unconditional no activation policy arm (11.4%,  $p < 0.01$ ) were also independently significant. The unconditional partial withdrawal arm demonstrated a decrease in the probability of having roof leaks or moisture problems (8.5%,  $p < 0.05$ ).

### Personal Finances:

Three studies examined differing outcomes related to personal finances: Nicholson 1977 (New Jersey experiment), Todeschini 2019 (B-Mincome), and West 2021 (SEED).

Nicholson 1977 found that under GBI homeowners significantly increased their financial assets (-97 to 48 USD, 1970 dollars,  $p < 0.05$ ), as well as home debt (19%,  $p < 0.05$ ), while significantly decreasing their non-home debt (590 to -71 USD, 1970 dollars,  $p < 0.05$ ) and their debt from non-home, non-auto, and non-medical sources (696 to -39 USD, 1970 dollars,  $p < 0.05$ ). Whereas renters demonstrated significant results only in the latter outcome; significantly decreasing their non-home, non-auto, non-medical debt from 151 to 68 USD (1970 dollars,  $p < 0.05$ ). Todeschini 2019 did not find any significant results relating to outstanding debt or to financial buffers reserved for unexpected expenses.

Alternatively, West 2021 found that GBI significantly decreased income volatility by 31% (statistical significance level not reported,  $p < 0.05$  is assumed) and increased ability to cover a \$400 USD emergency (52% in intervention group, 28% in control group; calculated  $d = 0.565$ , 95% CI: 0.307 to 0.822).

**Table 4.6***Results for Economic and Material Outcomes*

Outcome subcategory	Study	Outcome	Statistically significant results	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Financial hardship	Todeschini 2019	Falling behind in mortgage repayments or rent	Decrease of 20.5% ( $p < 0.05$ ) for unconditional arm without activation policy	
		Borrowing money from family or friends	Decrease of 7.3% ( $p < 0.05$ ) for all unconditional arms combined, 7.5% ( $p < 0.05$ ) for unconditional with partial withdrawal arm	
		Falling behind in utilities expenditures	--	
		Forced to leave current residence	--	
Material deprivation	Todeschini 2019	Severe material deprivation	Decrease of 7.6% ( $p < 0.05$ ) for all unconditional arms combined, 9.0% ( $p < 0.05$ ) for unconditional with full withdrawal, 11.4% ( $p < 0.01$ ) for unconditional without activation policy	
		Having roof leaks and moisture problems	Decrease of 8.5% ( $p < 0.05$ ) for unconditional with partial withdrawal arm	
		Material deprivation	--	
Personal finances	Nicholson 1977	Financial assets	--	SEP: increase for homeowners from -97 to 48 USD (1970 dollars, $p < 0.05$ )
		Cash	--	
		Home debt	--	SEP: increase for homeowners of 19% ( $p < 0.05$ )

Outcome subcategory	Study	Outcome	Statistically significant results	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Total non-home debt	--	<i>SEP</i> : decrease for homeowners from 590 to -71 USD (1970 dollars, $p < 0.05$ )
		Auto debt	--	
		Medical debt	--	
		All other debt (non-auto, non-medical)	--	<i>SEP</i> : decrease for homeowners from 696 to -39 USD (1970 dollars, $p < 0.05$ ); decrease for renters from 151 to 68 USD (1970 dollars, $p < 0.05$ )
	Todeschini 2019	Having outstanding debt	--	
		Buffer for unexpected financial expenses	--	
	West 2021	Income volatility - monthly fluctuation	Decrease of 31% (statistical significance not reported, $p < 0.05$ is assumed)	
		Ability to cover a \$400 emergency	Increase (52% in intervention group, 28% in control group; calculated $d = 0.565$ , 95% CI: 0.307 to 0.822)	
Subjective financial well-being	Lassander 2021	Financial stress	Decrease of 6.6% ( $p = 0.014$ )	
		Financial management/control	Increase of 10.8% ( $p < 0.001$ )	
		Financial freedom	--	
		Emergency funds	Increase of 6.3% ( $p = 0.009$ )	
	Muffels 2021	Financial stress and poverty	--	
	Todeschini 2019	Satisfaction with economic situation (0-10 scale)	Increase of 1.1 points ( $p < 0.01$ ) for all unconditional arms	

Outcome subcategory	Study	Outcome	Statistically significant results	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Food expenditure	Nicholson 1977	Expenditures - Food eaten at home	--	
		Expenditures - Food eaten out	--	<i>SEP</i> : increase for homeowners of 39% ( $p < 0.05$ ); ∇ decrease for renters of 19% ( $p < 0.05$ )
Non-food expenditures	Kaluzny 1979	Probability of becoming a homeowner	Increased probability during 1st year of 0.053 ( $p < 0.01$ )	
		Rental expenditure	Increase during 3rd year of 4.3% ( $p < 0.01$ )	
	Ladinsky 1977	Lifestyle enhancement – home improvements and repair	--	<i>SEP</i> : increase with home ownership at all quarters ( $p < 0.01$ ); ∇ <i>Race/ethnicity</i> : decrease for Black at 7th and 11th quarters ( $p < 0.05$ )
		Lifestyle enhancement – value of appliances owned	--	∇ <i>Place</i> : decrease in Paterson, NJ <sup>1</sup> at 6th and 10th quarters ( $p < 0.01$ ); <i>SEP</i> : increase with home ownership at 6th quarter ( $p < 0.01$ ); increase with family earnings at 10th quarter ( $p < 0.01$ ); <i>Age</i> : decrease with age at 10th quarter ( $p < 0.01$ )

<sup>1</sup> Trenton, NJ had the highest rate of families receiving social assistance benefits at 18%, followed by Scranton, PA at 15%, Paterson, NJ at 10%, and Jersey City, NJ at 5%.

∇ denotes an adverse result.

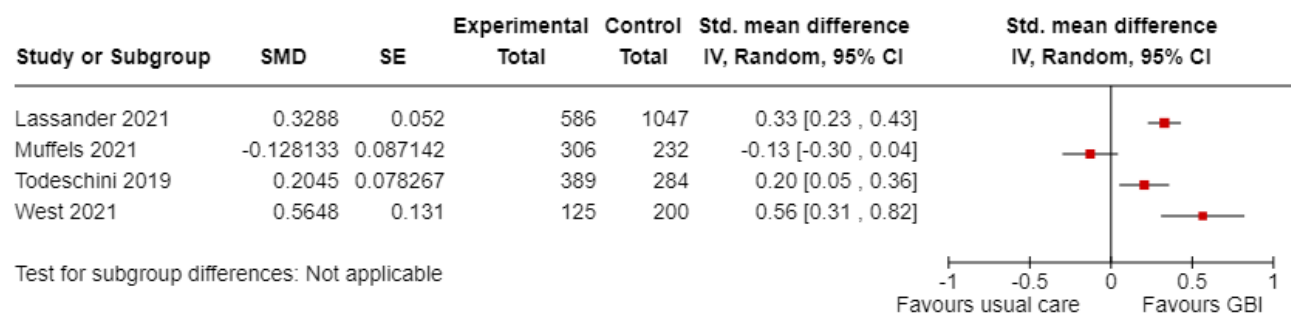
Outcome subcategory	Study	Outcome	Statistically significant results	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Lifestyle enhancement – value of cars owned	--	<i>Place</i> : increase in Trenton, NJ <sup>1</sup> at 10th quarter ( $p < 0.05$ ) <i>∇ Race/ethnicity</i> : decrease for Black at 10th quarter ( $p < 0.05$ ); <i>Education</i> : increase with education at 10th quarter ( $p < 0.05$ ); <i>SEP</i> : increase with home ownership at 10th quarter ( $p < 0.05$ ); Increase with family earnings at 6th quarter ( $p < 0.01$ ); <i>∇ Age</i> : decrease with age at 6th quarter ( $p < 0.01$ )
	Nicholson 1977	Expenditures - Clothing	--	
		Expenditures - Rent	--	
		Expenditures - Total durables	--	∇ <i>SEP</i> : decrease for renters of 31% ( $p < 0.05$ )
		Expenditures - Autos	--	∇ <i>SEP</i> : decrease for renters of 43% ( $p < 0.05$ )
		Expenditures - Home production appliances	--	<i>SEP</i> : increase for homeowners of 45% ( $p < 0.05$ )
		Expenditures - Furniture	--	∇ <i>SEP</i> : decrease for renters of 28% ( $p < 0.05$ )
		Expenditures - Other appliances	--	<i>SEP</i> : increase for homeowners of 45% ( $p < 0.05$ )

Subjective financial well-being:

Subjective financial well-being was measured in three experiments: B-Mincome (Todeschini 2019), the Dutch experiments (Muffels 2021), and the Finnish experiment (Lassander 2021). Figure 4.5 shows a visual representation of the effect estimates from each study. For comparison purposes, we also included one outcome from the previous subcategory, 'ability to cover a \$400 emergency' (West 2021) as a proxy for subjective financial well-being. The only study that did not report a significant effect is Muffels 2021, which examined interventions in eight Dutch cities, three of which provided an eligible intervention (GMI with partial withdrawal).

**Figure 4.5**

*Effects of GBI on Subjective Financial Well-Being*



Food Expenditure:

Food expenditure was examined by Nicholson 1977 (New Jersey experiment). GBI was found to be unrelated to at-home food expenditures but was linked to differences in food expenditures related to eating out. Homeowners demonstrated a 39% ( $p < 0.05$ ) increase in eating-out spending, whereas renters demonstrated a 19% ( $p < 0.05$ ) decrease.

### Non-food Expenditure:

A diverse set of outcomes relating to non-food expenditures was examined across three studies: Kaluzny 1979 (Gary experiment), Ladinsky 1977 (New Jersey experiment), and Nicholson 1977 (New Jersey experiment).

Kaluzny 1979 found that households receiving GBI increased their rental expenditure by 4.3% ( $p < 0.01$ ) and had a 0.053 higher probability of becoming homeowners than households compared to the control group ( $p < 0.01$ ). Ladinsky 1977 examined three lifestyle enhancing outcomes quarterly across three cities for three years. Home improvements and repair significantly increased among homeowners receiving GBI across all quarters ( $p < 0.01$ ) but decreased for Black participants at the 7th and 11th quarters ( $p < 0.05$ ). The value of owned appliances increased with home ownership at the 6th quarter ( $p < 0.01$ ) and increased along with family earnings at the 10th quarter ( $p < 0.01$ ). Whereas the value of owned appliances decreased with age during the 10th quarter ( $p < 0.01$ ) and decreased in Patterson (NJ) during both the 6th and 10th quarters ( $p < 0.01$ ). The value of cars owned increased with home ownership, education, and in Trenton (NJ) at the 10th quarter ( $p < 0.05$ ) and with family earnings at the 6th quarter ( $p < 0.01$ ). However, the value of owned cars decreased with age at the 6th quarter ( $p < 0.01$ ) and for Black residents at the 10th quarter ( $p < 0.01$ ).

Nicholson 1977 found that homeowners enrolled in GBI increased spending on both home production appliances and other appliances by 45% ( $p < 0.05$ ). Meanwhile, renters decreased spending on furniture, autos, and total durable products by 28%, 43%, and 31% respectively ( $p < 0.05$ ).

### *Physical health outcomes*

Ten studies of eight experiments investigated physical health outcomes: B-Mincome (Todeschini 2019), Gary (Kehrer 1979), Mincome (Forget 2011 and Forget 2013), New Jersey (Elesh 1977 and Kerachsky 1977), RIME/Rural (O'Connor 1979), SEED (West 2021), Finnish BI (Simanainen 2021), and Dutch (Muffels 2021). An overview of these outcomes, categorized into nine subgroups, is provided in Table 4.7.

#### Child Health (Administrative Data):

Kehrer 1979 examined birth weight and identified a significant increase of 530g ( $p < 0.01$ ) for the highest risk group and a decrease of 118g ( $p < 0.01$ ) for the lowest risk group based on factors including age, smoking, and time between pregnancies.

#### Child Health (Self-Reported):

Todeschini 2019 study examined young people reporting poor health and found a significant decrease of 21.4% ( $p < 0.05$ ) for the unconditional arm with partial withdrawal.

#### Physical Health (Administrative Data):

Forget 2011 and 2013 investigated total hospital separations of 1978 in contrast to 1973 and found a decrease of 19.2 per 1,000 (95% CI: 17.1 to 21.3). In addition, they discovered a decrease of 8.5% ( $p < 0.01$ ) for all causes of total hospital separations, and a decrease of 10% for accidents and injuries ( $p < 0.01$ ).

#### Physical Health (Self-Reported):

West 2021 explored 'energy over fatigue' and pain and found improvements in both ( $p = 0.023$  and  $p = 0.047$ , respectively). In Kerachsky 1977, a gender-based decrease was observed in the number of times males entered the hospital during the first out of three years ( $d = 0.154$ , 95% CI: 0.002 to 0.306). Simanainen 2021 indicated an increase in subjective state of health ( $\chi^2$  test  $p$ -value = 0.051).

**Table 4.7***Results for Physical Health Outcomes*

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Child health (administrative data)	Forget 2011	Small-for-gestational age, newborns	--	
		Low birth weight	--	
		At-risk birth weight	--	
	Kehrer 1979	Birth weight	--	<i>Age, smoking/not smoking, time between pregnancies:</i>  Increase of 530g ( $p<0.01$ ) for highest risk group (smoking, <16 months between pregnancies, age <18);  ∇ decrease of 118g ( $p<0.01$ ) for lowest risk group (not smoking, 16+ months between pregnancies, age 18-34)
Child health (self-reported)	Elesh 1977	Number of hospital days (children)	--	
		Number of bed days (children)	--	
		Number of chronic illnesses (children)	--	
	Todeschini 2019	Young people reporting bad health		Decrease of 21.4% ( $p<0.05$ ) for unconditional with partial withdrawal arm
		New obesity diagnostics on people under 15 years	--	
Physical health (administrative data)	Forget 2011, 2013	Total hospital separations (1978 vs 1973)		Decrease of 19.2 per 1,000 (95% CI: 17.1 to 21.3)

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Total hospital separations, all causes	Decrease of 8.5% ( $p < 0.01$ )	
		Hospital separations, accidents and injuries	Decrease of 10% ( $p < 0.01$ )	
Physical health (self- reported)	West 2021	Energy over fatigue	Increase ( $t(186)=7.30, p=0.023, d=0.335$ )	
		Pain (higher score is better)	Increase ( $t(189)=7.87, p=0.047, d=0.283$ )	
	Elesh 1977	Number of hospital days (husband and wife)	--	
		Number of chronic illnesses (husband and wife)	--	
	Kerachsky 1977	Number of Times Entered Hospital - Adults	--	<i>Gender/sex</i> : decrease for males during first year (out of three, ( $t(669)= 1.986$ ; calculated $d = 0.154$ , 95% CI: 0.002 to 0.306)
		Illness Lasting More Than 3 months - Adults	--	
	Todeschini 2019	Self-reported serious health problems	--	
Overall physical health (self-reported)	Muffels 2021	Subjective health	--	
	Simanainen 2021	Subjective state of health	Increase ( $\chi^2$ test $p$ -value = 0.051; calculated $d = 0.146$ , 95% CI: 0.044 to 0.247)	
	Todeschini 2019	Self-rated health being good, very good or excellent	--	
	West 2021	General Health	--	
Overall health and wellbeing	West 2021	Overall Health and Wellbeing	--	
Health-related impairments/limitations	Kerachsky 1977	Illness Interfering With Work	--	

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Illness Preventing Work - Males Only	--	
	Simanainen 2021	Having a disease, disability or mental disorder that hinders daily life	Decrease ( $\chi^2$ test $p$ -value of 0.026; calculated $d = -0.126$ , 95% CI: -0.227 to -0.025)	
	West 2021	Physical functioning	--	
		Role limitations due to physical health	--	
		Social functioning (due to health)	--	
Nutrition	O'Connor 1979	Quality of dietary intake	--	<i>Place</i> : increase in North Carolina <sup>1</sup> ( $t(372)=2.42, p=0.02$ ; calculated $d=0.251, 95\% \text{ CI: } 0.047 \text{ to } 0.455$ )
Sleep	Todeschini 2019	Quality of sleep	Increase of 7.6% ( $p<0.05$ ) for unconditional arm with partial withdrawal	
		Sleep deprivation - hours slept	--	

<sup>1</sup> In North Carolina, 62% of families had pre-enrollment incomes below the poverty line, compared to 37% in the other experimental site of Iowa.

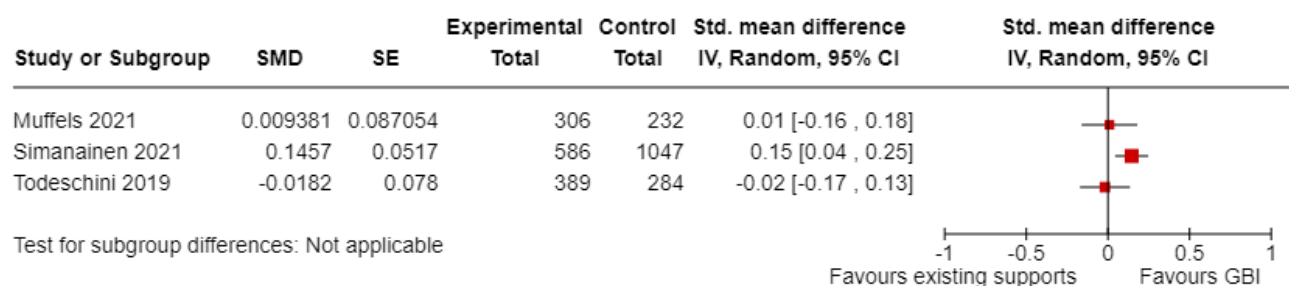
∇ denotes an adverse result.

### Overall Physical Health (Self-Reported):

Self-rated overall physical health was measured in four of the experiments: B-Mincome (Todeschini 2019), the Dutch experiments (Muffels 2021), the Finnish experiment (Simanainen 2021), and SEED (West 2021). The effect estimates from the first three are visually represented in Figure 4.6. The result from SEED was reported only as non-significant, so we did not have the effect estimate to include.

**Figure 4.6**

#### *Effects of GBI on Self-Rated Overall Physical Health*



The GBI interventions in B-Mincome and the Dutch experiments both replaced most of the existing social assistance programs, whereas the intervention in the Finnish experiment was of the supplemental GBI type, so benefits were not reduced with increased income from other sources. The effect estimate from the Finland study is significant but small ( $d = 0.146$ ). The SEED intervention was also of the supplemental GBI type but would likely have resulted in a smaller pooled estimate (if combined with the Finnish result) since it was not statistically significant.

### Health-Related Impairments or Limitations:

Simanainen 2021 also found a decrease in having a disease, disability, or mental disorder that hinders daily life ( $\chi^2$  test  $p$ -value of 0.026).

#### Nutrition:

O'Connor 1979 assessed dietary intake quality, noting an increase by geographical location in North Carolina ( $p < 0.05$ ;  $d = 0.251$ , 95% CI: 0.047 to 0.455).

#### Sleep:

Todeschini 2019 reported a quality of sleep increase of 7.6% ( $p < 0.05$ ) for the unconditional arm with partial withdrawal.

### ***Psychological and mental health outcomes***

The outcomes in this category were grouped into seven subcategories, as described in the following paragraphs. A summary of the outcomes is also presented in Table 4.8.

#### Cognitive functioning:

One of the included studies (Simanainen 2021, Finnish experiment) reported outcomes in this subcategory, and found statistically significant positive effects of the supplemental GBI intervention on memory (calculated  $d = 0.212$ , 95% CI: 0.110 to 0.313), learning (calculated  $d = 0.281$ , 95% CI: 0.179 to 0.383), and ability to concentrate (calculated  $d = 0.264$ , 95% CI: 0.162 to 0.365).

**Table 4.8***Results for Psychological/Mental Health Outcomes*

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Cognitive function (self-rated)	Simanainen 2021	Memory	Increase ( $\chi^2$ test $p$ -value of 0.001; calculated $d = 0.212$ , 95% CI: 0.110 to 0.313)	
		Learning	Increase ( $\chi^2$ test $p$ -value < 0.001; calculated $d = 0.281$ , 95% CI: 0.179 to 0.383)	
		Ability to concentrate	Increase ( $\chi^2$ test $p$ -value < 0.001; calculated $d = 0.264$ , 95% CI: 0.162 to 0.365)	
Psychological well-being (self-rated)	Middleton 1977	Perceived quality of life	--	
	Bonilla 2019	Life satisfaction (0-10 scale)	Increase of 0.92 points (calculated $d = 0.35$ , 95% CI: 0.22 to 0.48)	<p><i>Race/ethnicity</i>: increase for non-EU ethno-cultural background (calculated <math>d = 0.14</math>, 95% CI: 0.01 to 0.27)</p> <p><i>Sex/gender</i>: increase for female (calculated <math>d = 0.21</math>, 95% CI: 0.08 to 0.34)</p> <p><i>SEP</i>: increase with income decile (calculated <math>d = 0.21</math>, 95% CI: 0.08 to 0.34)</p> <p><i>Social capital</i>: increase with support network (calculated <math>d = 0.12</math>, 95% CI: 0.01 to 0.24)</p>

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
	Muffels 2021	Life satisfaction and subjective well-being (0-10 scale)	--	
	Simanainen 2021	General life satisfaction (0-10 scale)	Increase of 0.5 points ( $p < 0.001$ )	
	Todeschini 2019	General life satisfaction (0-10 scale)	Increase of 1.2 points ( $p < 0.01$ ) for all unconditional arms combined	
		Being very satisfied with their life (score of >7 on 0-10 scale)	Increase of 15.4% ( $p < 0.01$ ) for all unconditional arms combined, 16.1% ( $p < 0.01$ ) for unconditional with full withdrawal, 17.5% ( $p < 0.01$ ) for unconditional plus activation policy	
Mental health (administrative data)	Forget 2011, 2013	Hospital separations, non-congenital mental health diagnoses	Decrease of 16% ( $p < 0.01$ )	
Mental health (self-reported, composite score)	Simanainen 2021	Clinical mental distress (MHI-5 score below 53/100)	Decrease of 7.5% ( $p = 0.001$ )	
	Thoits 1979	Psychological distress score (adapted Macmillan Health Survey)	--	Reported for 30 different combinations of race/ethnicity (white, Black, Chicano), marital status (married, single), gender/sex (men, women), intervention length (3 or 5 years) and site (Denver, Seattle);  ∇ 6 of 30 results were statistically significant, all indicating increased distress.

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Mental health (self-reported, single item)	West 2021	Psychological distress score (Kessler 10 scale)	--	
		Emotional health (Kessler 10 subscale)	Increase (t(183)=14.85, p=0.012, d=0.370)	
		Emotional well-being (Kessler 10 subscale)	Increase (t(191)=7.70, p=0.022, d=0.332)	
	Middleton 1977	General happiness	--	
		Psychosomatic and nervous symptoms	--	
		Self-esteem	--	
		Feeling of "nothing to do"	--	
	Simanainen 2021	I have been very nervous over the last 4 weeks	--	
		I felt so low that nothing could make me feel better over the last 4 weeks	Decrease ( $\chi^2$ test p-value = 0.003; calculated d = -0.210, 95% CI: -0.312 to -0.108)	
		I felt peaceful and calm over the last 4 weeks	--	
I felt sad and downcast over the last 4 weeks		Decrease ( $\chi^2$ test p-value = 0.003; calculated d = -0.238, 95% CI: -0.341 to -0.136)		
I have been happy over the last 4 weeks		--		
I have experienced depression		Decrease of 10.1% (p < 0.001)		
I have experienced an inability to enjoy		Decrease of 11.5% (p < 0.001)		

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		I experience loneliness	Decrease ( $\chi^2$ test $p$ -value of 0.032; calculated $d = -0.171$ , 95% CI: -0.272 to -0.069)	
	Todeschini 2019	Probability of developing a mental disorder (self-reported)	--	
		New diagnostics of anxiety and depression	--	
Outlook	Middleton 1977	Anomy	--	
		Aspirations	--	
		Control of future	--	
		Community efficacy	--	
		Expectation of better job in future	--	
Worries	Middleton 1977	Worry - money	--	
		Worry - own health	--	
		Worry - health of wife, children	∇ Increase of 0.12 points (10-point scale, $p < 0.05$ )	
		Worry - raising children	--	

Note: ∇ denotes an adverse effect.

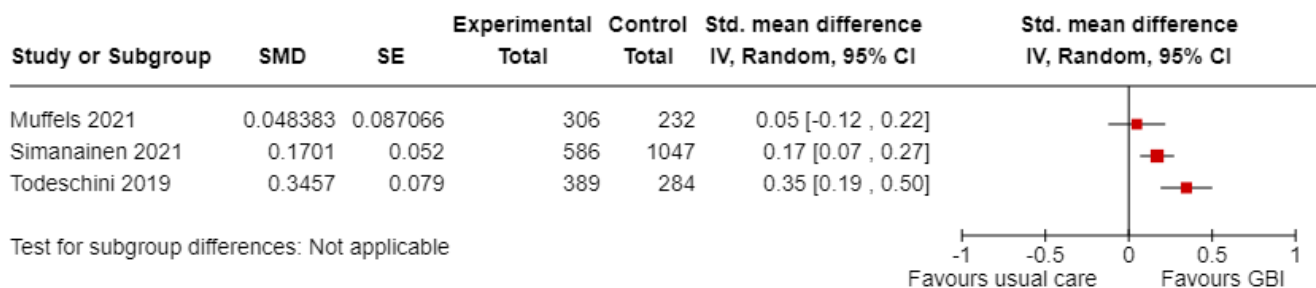
Self-rated psychological well-being:

One study (Middleton 1977, New Jersey experiment) examined perceived quality of life but did not find any significant effects of the NIT interventions.

Self-rated life satisfaction was assessed in three experiments: B-Mincome (Bonilla 2019, Todeschini 2019), the Dutch experiments (Muffels 2021), and the Finnish experiment (Simanainen 2021). The Bonilla 2019 study examined this outcome for the entire sample and did not report separate analyses by intervention arm. Since the B-Mincome experiment included arms that were conditional on participation in "activation policies" (e.g., training or community projects), we did not include this study in the meta-analysis shown in Figure 4.7.

**Figure 4.7**

*Effects of GBI on Self-Rated Life Satisfaction*



We did not pool the effect estimates for this outcome because the interventions were different in each of the three experiments. The Todeschini study on B-Mincome (GMI with partial withdrawal arms only) reported a significant result with the largest magnitude ( $d = 0.35$ , 95% CI: 0.19 to 0.50). The second-largest result came from the Finnish experiment (Simanainen 2021), while the Dutch experiments did not yield significant results at any of the municipal intervention sites (other than a negative one from a conditional (excluded) arm in the city of Oss). Bonilla 2019 reported the same effect estimate for the entire B-Mincome sample as

Todeschini 2019 reported for the unconditional/partial withdrawal arm, except with a slightly narrower confidence interval ( $d = 0.35$ , 95% CI: 0.22 to 0.48).

Mental health outcomes assessed using administrative data:

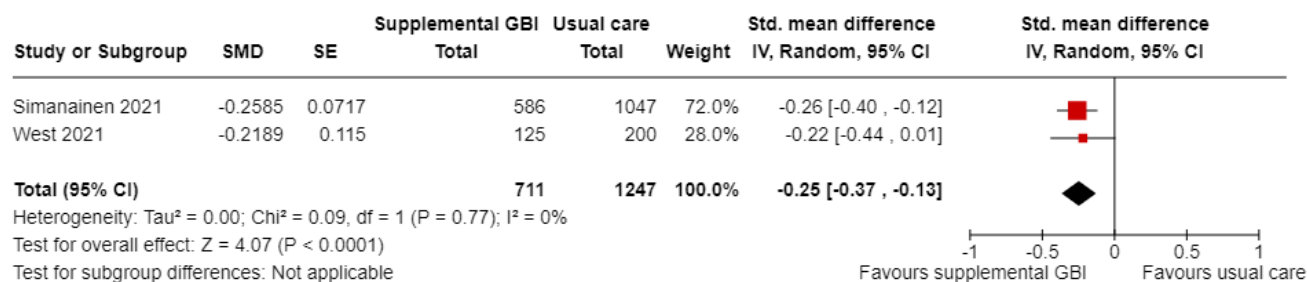
One study (Forget 2011/2013, Mincome) reported the outcome of hospital separations for non-congenital mental health diagnoses, for which a 16% community-wide reduction was found ( $p < 0.01$ ) following the NIT intervention in the ‘saturation’ site of Dauphin.

Self-reported mental health assessed using survey composite scores:

For the outcome of self-rated mental distress, we were able to pool the results of the Finnish experiment (Simanainen 2021) and SEED (West 2021), as both used the supplemental GBI approach in which benefits were not affected by changes in other income (see Figure 4.8). On its own, the result from the SEED experiment was not significant at the 5% level ( $p = 0.056$ ); however, the pooled SMD (with the larger Finnish experiment) is statistically significant ( $d = -0.25$ , 95% CI: -0.37 to -0.13), indicating a reduction in self-rated mental distress.

## Figure 4.8

### *Effect of Supplemental GBI on Self-Rated Mental Distress*



This outcome was also examined in SIME/DIME (Thoits 1979), which provided NIT benefits in various configurations of guarantee and tax rate; however, this study did not yield consistent results across sites or subgroups.

### *Social outcomes*

Table 4.9 summarizes the outcomes falling under this category, which was divided into three subcategories. The paragraphs below present the statistically significant findings for these outcomes. In most cases, we were not able to report the magnitude of the effect estimate in a meaningful way or calculate the SMDs due to missing statistical information in the included articles (e.g., regression coefficients reported without standard errors, or sample sizes not reported).

#### Social engagement:

Outcomes in this subcategory were reported in two studies: Ladinsky 1977 (New Jersey experiment) and Todeschini 2019 (B-Mincome experiment). Ladinsky 1977 observed a significant increase in social visits at the 3-year timepoint ( $p < 0.01$ ), which subsequently decreased with age ( $p < 0.01$ ). In addition, they reported a rise in the provision of financial aid to friends or relatives at the 1-year timepoint ( $p < 0.05$ ), independent of geographical location ( $p < 0.01$ ). Moreover, Ladinsky 1977 found that attendance at religious services increased significantly during the 7th quarter ( $p < 0.05$ ), and this increase was positively associated with age and home ownership ( $p < 0.01$ ). In contrast, Todeschini 2019 identified an 8.1% decrease in engagement with volunteer activities ( $p < 0.05$ ).

#### Social perception:

Muffels 2021 and Todeschini 2019 analyzed outcomes in this subcategory, but no significant findings were reported.

#### Anti-social behavior:

Among the studies considered, two (Calnitsky 2021 and Groeneveld 1979) focused on outcomes related to anti-social behaviour.

Calnitsky 2021 (Mincome experiment) focused on total, violent, property, and other crime rates. The results indicated a significant decrease in total crime rates of 1,438 per 100,000 ( $p < 0.01$ ). Education played a role, with a decrease of 977 per 100,000 associated with a percent increase in the population with any post-secondary education ( $p < 0.01$ ). Violent crime rates decreased by 346 per 100,000 ( $p < 0.01$ ), and a relationship with socioeconomic status (SEP) was observed, where average family income correlated with a decrease in violent crime rates ( $p < 0.05$ , magnitude not specified). Property crime rates decreased by 726 per 100,000 ( $p < 0.01$ ), and education again showed an effect, with a reduction of 571 per 100,000 associated with an increase in post-secondary education ( $p < 0.01$ ). For other crime rates, a decrease of 340 per 100,000 was linked to an increase in the population with any post-secondary education ( $p < 0.05$ ).

Groeneveld 1979 (SIME-DIME experiment) found a statistically significant decrease of 11% ( $p < 0.01$ ) in the probability of delinquency for males with mothers who were employed before the experiment. However, a contrasting trend was observed in males with a prior police record. In this subgroup, the probability of delinquency demonstrated an increase of 18% ( $p < 0.05$ ). Groeneveld 1979 also delved into the probability of delinquency related to more serious offences. For females, those with a sibling having a police record exhibited an increase of 26% ( $p < 0.01$ ) in the probability of delinquency. Among males, changing residence was identified as a significant Plus factor affecting the probability of serious offences. The study discovered a 22% increase ( $p < 0.05$ ) in the likelihood of delinquency for males who changed their residence during the experiment.

**Table 4.9***Results for Social Outcomes*

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Social engagement	Ladinsky 1977	Social Integration – social visits	Increase at 3-year (final) timepoint ( $p<0.01$ )	<i>Age</i> : decrease with age ( $p<0.01$ )
		Social Integration – husband-wife	--	<i>Place</i> : decrease in Trenton, NJ <sup>1</sup> ( $p<0.05$ ); <i>Age</i> : decrease with age ( $p<0.01$ );
		Social Integration – family	--	<i>Age</i> : decrease with age ( $p<0.01$ )
		Social Integration – giving financial aid to friend or relative	Increase at 1-year timepoint ( $p<0.05$ )	<i>Place</i> : increase at 1-year timepoint in all three New Jersey sites <sup>1</sup> (versus Scranton, PA; $p<0.05$ )
		Social Integration – membership in organizations	--	<i>Place</i> : decrease in Jersey City, NJ <sup>1</sup> ( $p<0.01$ ); <i>Education</i> : increase with education ( $p<0.01$ );
		Social Integration – attendance at religious services	Increase at 7th quarter ( $p<0.05$ )	<i>SEP</i> : increase with age and home ownership (both $p<0.01$ )
		Todeschini 2019	Social participation	--
	Volunteering activities	∇ Decrease of 8.1% ( $p<0.05$ ) for unconditional arm without activation policy		
	Electoral participation	--		
	Participation in social leisure	--		

<sup>1</sup> Trenton, NJ had the highest rate of families receiving social assistance benefits at 18%, followed by Scranton, PA at 15%, Paterson, NJ at 10%, and Jersey City, NJ at 5%.

∇ denotes an adverse result.

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Social perceptions	Muffels 2021	Perceived extent of social integration	--	
		Social trust	--	
	Todeschini 2019	Social support and stress - Duke Scale	--	
		Confidence support	--	
		Emotional support	--	
		Total perceived support	--	
Anti-social behavior	Calnitsky 2021	Total crime rates	Decrease of 1,438 per 100,000 ( $p < 0.01$ )	<i>Education:</i> decrease of 977 per 100,000 with percent increase in the population with any post-secondary ed. ( $p < 0.01$ )
		Violent crime rates	Decrease of 346 per 100,000 ( $p < 0.01$ )	<i>SEP:</i> decrease with average family income ( $p < 0.05$ , magnitude unclear)
		Property crime rates	Decrease of 726 per 100,000 ( $p < 0.01$ )	<i>Education:</i> decrease of 571 per 100,000 with percent increase in the population with any post-secondary ed. ( $p < 0.01$ )
		Other crime rates	--	<i>Education:</i> decrease of 340 per 100,000 with percent increase in the population with any post-secondary ed. ( $p < 0.05$ )
	Groeneveld 1979	Probability of delinquency - status offenses	--	<i>Gender/sex and Plus factor:</i>  Decrease of 0.11 ( $p < 0.01$ ) for males with mother employed before experiment  ∇ increase of 0.18 ( $p < 0.05$ ) for males with prior police record

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Probability of delinquency - serious offenses	--	<i>Gender/sex and Plus factor:</i>  ∇ increase of 0.26 ( $p < 0.01$ ) for females with sibling with police record;  ∇ increase of 0.22 ( $p < 0.05$ ) for males who changed residence

### *Educational outcomes*

Educational and training outcomes were examined in seven studies on six of the experiments: B-Mincome (Todeschini 2019), Gary (Maynard 1979), Mincome (Forget 2011), New Jersey (Mallar 1977), RIME/Rural (Maynard 1977), and SIME/DIME (Manheim 1979, Venti 1984). A summary of these outcomes, grouped into five subcategories, is presented in Table 4.10.

#### Absenteeism:

Three included studies addressed absences from education and training (Maynard 1977, Maynard 1979, and Manheim 1979). Among these, only Maynard 1977 reported a statistically significant decrease in the number of days absent. This reduction, amounting to 30.4%, was observed in a specific geographical location (North Carolina) and was statistically significant ( $p < 0.05$ ).

#### Academic Performance:

Maynard 1979 noted a significant increase of 22 points in reading test scores for students in grades four through six ( $p < 0.01$ ). This improvement was even more pronounced among families with incomes below half of the poverty line (29.5 points,  $p < 0.05$ ). Conversely, they discovered a significant decrease of 1.6 points in the grade point average for students in grades seven through ten ( $p < 0.01$ ). Notably, this decrease was not evident among families below half of the poverty line, but they found a larger decrease of 2.2 points ( $p < 0.01$ ) for families above half of the poverty line.

#### Comportment:

Maynard 1977 also reported an increase in the comportment grade point average, specifically in the geographical location of North Carolina, amounting to 6.7% ( $p < 0.05$ ).

### School Continuation:

Five studies examined the subcategory of school continuation. McDonald 1979 reported an increase in the likelihood of males from families below the NIT breakeven income continuing into post-mandatory education (calculated  $d=0.406$ , 95% CI: 0.061 to 0.751). Additionally, Forget 2011 discovered an approximate 15% increase in grade 11 and 12 enrolments following the supplemental GBI intervention ( $p<0.05$ ). Similarly, Mallar 1977 found an increase in the probability of high school completion for six out of the eight NIT plans ( $p<0.01$ ) and a decrease in the remaining two plans ( $p<0.01$ ). Moreover, they observed an increase of approximately one year in the number of years of schooling attained for six of the eight NIT plans ( $p<0.05$ ). Lastly, Venti 1984 identified a 25% increase in the probability of schooling ( $p<0.05$ ), which was even more substantial among female and white individuals ( $p<0.05$ ).

**Table 4.10***Results for Educational Outcomes*

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Absenteeism	Maynard 1977	Days absent	--	<i>Place</i> : decrease in North Carolina <sup>1</sup> of 30.4% ( $p < 0.05$ )
	Maynard 1979	Days absent	--	
	Manheim 1979	Absence rate	--	
Academic performance	Todeschini 2019	Repeating course (grades 17/18 and 18/19)	--	
	Maynard 1979	Reading test score	Increase of 22 points ( $p < 0.01$ ) for grades 4-6 (score range not reported)	<i>SEP</i> : larger increase (29.5 points, $p < 0.05$ ) for grades 4-6 if pre-enrollment family income was below half of poverty line
	Maynard 1977	Deviation from expected grade equivalent score on standardized achievement test	--	<i>Place</i> : decrease (smaller deficit) in North Carolina <sup>1</sup> of 18.9% ( $p < 0.05$ )
	Maynard 1977	Standardized achievement test score - Percentile Score	--	

<sup>1</sup> In North Carolina, 62% of families had pre-enrollment incomes below the poverty line, compared to 37% in the other experimental site of Iowa.

∇ denotes an adverse result.

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
	Maynard 1979	Grade point average	∇ Decrease of 1.6 points ( $p<0.01$ ) for grades 7-10 (score range not reported)	<i>SEP</i> : no decrease if family income was below half of poverty line;  ∇ larger decrease (-2.2 points, $p<0.01$ ) if family income was above half of poverty line
	Maynard 1977		--	
	Manheim 1979		--	
	Manheim 1979	Standardized test score	--	
Comportment	Maynard 1977	Comportment grade point average	--	<i>Place</i> : increase in North Carolina <sup>1</sup> of 6.7% ( $p<0.05$ )
School continuation	Todeschini 2019	Continuing into post-mandatory education	--	
	McDonald 1979		--	<i>Gender/sex and SEP</i> : increase for males with below breakeven family income [ $t(135)=2.33$ ; calculated $d=0.406$ , 95% CI: 0.061 to 0.751]
	Forget 2011	Grade 11/12 Enrolment	Increase of ~15% ( $p<0.05$ assumed) <sup>2</sup>	

<sup>2</sup> Magnitude is estimated from bar graph in Forget 2011; significance level is not reported for this outcome, but other significant outcomes are reported at  $p<0.05$ .

∇ denotes an adverse result.

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
	Mallar 1977	Probability of high school completion	Increased probability (adjusted differential of 0.104 to 0.470) for six of eight NIT plans ( $p<0.01$ ), decrease (-0.113 to -0.140) for two of eight NIT plans ( $p<0.01$ )	
	Mallar 1977	Years of Schooling Attained	Increase (0.37 to 1.51 years) for six of eight NIT plans ( $p<0.05$ )	
	Mallar 1977	College attendance	--	
	Venti 1984	Probability of Schooling	Increase in probability of 0.088 or 25% ( $p<0.05$ )	<i>Sex/gender</i> : larger increase for female (0.123, $p<0.05$ ); <i>Race/ethnicity</i> : larger increase for white (0.140, $p<0.05$ );  <i>Age</i> : larger increase for age 18 (0.140, $p<0.05$ )
Skills development	Todeschini 2019	Number of persons in the household doing training	--	

### *Individual choice and agency outcomes*

Table 4.11 summarizes the outcomes for individual choice and agency, grouped into three subcategories. The paragraphs below describe the statistically significant findings for these outcomes.

#### Use of Time - Recreation and Entertainment:

Ladinsky 1977 (New Jersey experiment) found a significant decrease in leisure activities such as visiting parks and zoos, going to movies, restaurants, and bars at 9 months. Furthermore, they revealed differences across PROGRESS-Plus factors. For instance, Spanish-speaking individuals showed a more substantial decrease at 21 months ( $p < 0.01$ ). On the other hand, engagement in hobbies, sports activities, and vacations did not show any significant results overall. However, age seemed to play a role, with a decrease in involvement observed with increasing age at 21 months ( $p < 0.01$ ).

#### Choice/Agency:

Regarding agency and choice, Calnitsky 2019 (Mincome experiment) explored the reasons for not working. The study found that females experienced an increase in deciding not to work due to family reasons with an increase of 11.7% (95% CI: 2.7% to 20.7%), Similarly, job/work conditions were a consideration with a rise of 11.3% (95% CI: 0.5% to 22.1%), and education with an increase of 9.0% (95% CI: 0.4% to 17.6%). In addition, the study found a 4.0% increase (95% CI: 0.4% to 7.6%) in individuals who did not want to work, with a more significant increase observed in the age group of 26 to 49 years, which was 5.9% (95% CI: 1.7% to 10.1%).

#### Agency (Wife):

Only one study examined outcomes in this subcategory. In terms of financial disagreements, Gonalons-Pons (2021) (Mincome experiment) observed a significant decrease within geographical locations (Winnipeg/urban areas) for the financial disagreement index,

having enough money, and deciding to save or spend (all with  $p < 0.05$ ). In addition, they found that non-financial disagreements showed a decrease in Dauphin rural site related to husband's habits (calculated  $d = -0.526$ , 95% CI: -0.785 to -0.267) as well as the Winnipeg urban site concerning religious beliefs (calculated  $d = -0.575$ , 95% CI: -0.814 to -0.336) and choice of friends (calculated  $d = -0.644$ , 95% CI: -0.884 to -0.403).

**Table 4.11***Results for Individual Choice and Agency Outcomes*

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
Use of time - recreation and entertainment	Ladinsky 1977	Leisure Activities – parks and zoos, movies, restaurants, and bars	∇ Decrease at 9 months ( $p < 0.05$ )	∇ <i>Race/ethnicity</i> : decrease for Spanish- speaking at 21 months ( $p < 0.01$ );  <i>Education</i> : Increase with education at 21 months ( $p < 0.01$ )
		Leisure Activities – involvement in hobbies, sports activities, and vacations	--	∇ <i>Age</i> : decrease with age at 21 months ( $p < 0.01$ )
	Todeschini 2019	Participation in individual leisure	--	
Choice/agency	Calnitsky 2019	Reason for not working – any reason	--	<i>Gender/sex</i> : increase for females of 11.7% (95% CI: 2.7% to 20.7%)
		Reason for not working – family	--	
		Reason for not working – job/work conditions	--	<i>Gender/sex</i> : increase for females of 11.3% (95% CI: 0.5% to 22.1%)
		Reason for not working – unpaid vacation	--	
		Reason for not working – education	--	<i>Gender/sex</i> : increase for females of 9.0% (95% CI: 0.4% to 17.6%)

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Reason for not working – did not want to work	Increase of 4.0% (95% CI: 0.4% to 7.6%)	<i>Age</i> : increase for ages 26-49 of 5.9% (95% CI: 1.7% to 10.1%)
		Reason for not working – ill or disabled	--	
		Reason for not working – self-employed	--	
		Reason for not working – retired	--	
		Reason for not working – other/unknown	--	
	Muffels 2021	Perceived capabilities, freedom of choice	--	
Agency (wife)	Gonalons-Pons 2021	Bargaining and decision-making power - on wife's job	--	
		Bargaining and decision-making power - on important decisions	--	
		Bargaining and decision-making power - who wins out	--	
		Financial disagreement index (6-item scale)	--	<i>Place</i> : decrease in Winnipeg/urban ( $p < 0.05$ )
		Financial disagreement - have enough money	--	<i>Place</i> : decrease in Winnipeg/urban ( $p < 0.05$ )
		Financial disagreement - save or spend	--	<i>Place</i> : decrease in Winnipeg/urban ( $p < 0.05$ )

Outcome subcategory	Study	Outcome	Study findings	
			Full study sample (-- denotes no evidence of effect)	By PROGRESS-Plus factor (for which evidence of effect was reported)
		Non-financial disagreement index (7-item scale)	--	
		Non-financial disagreement - husband's habits	--	<i>Place:</i> decrease in Dauphin/rural (calculated $d = -0.526$ , 95% CI: -0.785 to -0.267)
		Non-financial disagreement - religious beliefs	--	<i>Place:</i> decrease in Winnipeg/urban (calculated $d = -0.575$ , 95% CI: -0.814 to -0.336)
		Non-financial disagreement - choice of friends <sup>1</sup>	--	<i>Place:</i> decrease in Winnipeg/urban (calculated $d = -0.644$ , 95% CI: -0.884 to -0.403)

*Note:* ∇ denotes an adverse result.

## Discussion

### *Summary of main results*

This systematic review examines the effects of guaranteed basic income interventions on poverty-related outcomes in developed high-income countries. Using very specific inclusion criteria, we identified 10 experiments and 27 related studies examining GBI interventions that resemble how GBI could potentially be implemented as full-scale programs. Therefore, we excluded studies of interventions, policies, or programs that were conditional, not cash-based, or not paid in regular, fixed or predictable amounts. As a result, the evidence examined in this review was more applicable to real-world GBI proposals.

**GBI typology.** We developed a framework for categorizing GBI approaches to assist in the evaluation and synthesis of the various approaches. We discovered that this was essential for a meaningful comparison of empirical evidence because each type of GBI approach provides financial assistance differently. To compare the effects of GBI interventions without classifying them by their type would be similar to conducting an evidence synthesis of drug trials testing the efficacy of either aspirin, ibuprofen, or acetaminophen, but not knowing which drug was given in each trial.

Based on the empirical and conceptual versions of guaranteed basic income that we found in the literature on guaranteed basic income, we identified five general types: subsistence-level fixed amount, supplemental fixed amount, guaranteed minimum income (GMI) with full benefit withdrawal, GMI with partial benefit withdrawal, and negative income tax.

The actual benefit amount varies within each GBI type, and once the type is identified, the next step in future research could be to examine 'dose' responses (i.e., the effects of various benefit amounts of one GBI type). This was attempted in the early NIT experiments by providing varying guarantee levels and withdrawal rates to different subgroups of participants. Unfortunately, the experiments were so complex that even statisticians later

debated over the appropriate analysis methods to use. One of the researchers involved in the SIME/DIME experiment wrote the following: "We decide on research questions; we get together to develop the survey instruments; and then, almost as an afterthought we realize that we have to process the data. We are finally learning that the design of the data processing and the data management system has to be done before the rest of the design of the project" (Bell et al., 1979, p. 52).

Due to the considerable diversity of reported outcomes and the limited reporting of statistical data for each intervention arm in the included studies, we did not have enough information to examine dose responses by GBI type. However, this will likely be possible in the near future because many more GBI experiments are currently underway. In the U.S., 100 guaranteed income pilots have been announced or started since 2017, involving a total of 38,000 participants (Economic Security Project, 2022). In Germany, the privately funded Mein Grundeinkommen (My Basic Income; 2023) was launched in 2020 and will provide €1,000 per month to 1,500 recipients for three years. The Government of Ireland (2022) has also launched a 3-year Basic Income for the Arts pilot which pays €325 per week to 2,000 recipients. Also, the two pilots in England and Wales described above will be started soon. The results of all these interventions will be easier to understand, compare, and meta-analyze (possibly including dose responses) if they are categorized by the type of GBI using the framework presented above.

**Primary outcomes:**

***Food insecurity.*** Food insecurity was only examined in two included studies: McIntyre 2016a on the Canada public pension, and Todeschini 2019 on the B-Mincome pilot. Although the first one used a quasi-experimental design (repeated cross-sectional) examining individuals, and the other was an RCT with household allocation, both studies reported substantial reductions in food insecurity when participants received a guaranteed basic income. The Canada public pension is based on a negative income tax approach, while B-

Mincome tested the two types of guaranteed minimum income (GMI): one with full (dollar-for-dollar) withdrawal of benefits, and the other with partial withdrawal, which is similar to NIT. We did not include the full-withdrawal arms in our synthesis because, while there were no conditions for receipt of benefits, we consider this approach to be a quasi-GBI because it doesn't meet the criterion of providing an income base for all recipients (e.g., if other income reaches 98% of the guaranteed amount, the benefit would be reduced by 98%)

B-Mincome also included intervention arms with "activation policies": training and employment, social entrepreneurship, room rental (by homeowners), and community participation. In the conditional arms, participants were required to engage in one of the four policies to be eligible for benefits, while in the unconditional-with-activation-policy arms, participants were assigned to one of the four policies, but participation was optional. In the "cash transfer only" arm (Todeschini 2019), participants received the benefits unconditionally without being assigned to any of the activation policies.

For all the unconditional arms in B-Mincome (i.e., those included in this review), the mean food insecurity score at the final timepoint was 0.224 points lower on a 10-point scale than for the control group ( $p < 0.05$ ). For the unconditional arms with assigned (but optional) activation policies, the result was not statistically significant; however, the largest reduction (0.299 points,  $p < 0.01$ ) of all the subgroups was observed with the unconditional arm with no activation policy (cash transfer only). Interestingly, Todeschini (2019) reported that the participation rate was the same for the training and employment programs (81%) whether they were mandatory (conditional arm) or optional (unconditional arm), and the change in food insecurity was not statistically significant for either of these arms. One possible explanation is that participants who engaged in the training and employment programs incurred work-related expenses that cut into their household food budget. This reallocation of income, if necessary, would be relevant to the problem of in-work poverty.

***Official, national, and international poverty measures.*** As reported above, we did not find any GBI studies that used national poverty measures (official or alternative), or internationally used poverty indexes or multidimensional measurement scales.

**Secondary outcomes:**

***Economic and material.*** The results in this category were mostly favourable with respect to poverty outcomes, which would be expected if interventions provide more income than the existing social assistance programs. Adverse results were rare and may have been due to multiple hypothesis tests for different outcomes and subgroups of participants. Many of the included studies performed over twenty tests of statistical significance on the data, so with a significance level of 5% it is likely that at least one result that appears significant is due to chance. There were no adverse results when the entire sample was analyzed.

Subjective financial well-being was examined in three studies, along with "ability to cover a \$400 emergency" in a fourth. The only study that did not find a significant improvement evaluated the Dutch experiments, in which the amount of the GBI benefit was equal to the existing social assistance benefit, except that the GBI benefit was given unconditionally. The other three studies (on B-Mincome, the Finnish experiment, and SEED), which provided higher amounts than social assistance, found statistically significant improvements.

***Physical health.*** Improvements were reported for some specific health-related outcomes (energy over fatigue, pain, hospital separations, quality of sleep), but no change in general health was found, except in one study. In the Finnish experiment, a statistically significant result was found for self-rated health; however, the Stockton study (SEED) which provided a similar supplemental GBI intervention did not find a significant effect. The Finnish study also found an improvement in a similar outcome variable, "having a disease, disability or mental disorder that hinders daily life," The absence of a significant result for

overall health in the U.S. SEED study may be due to population differences between the two experiments.

There is also the question of whether a limited-duration experiment can have an impact on overall health. The Forget (2011, 2013) study of Mincome in Canada found significant reductions in hospital separations in the 'saturation' site of Dauphin, reductions which persisted for several years after the experiment ended even though only about 20% of the Dauphin residents received the GBI benefit. The study authors proposed that people with the lowest income had poorer health and needed to be hospitalized more often, so improvements in their health may explain the observed reduction. On the other hand, Green (2022) conducted a re-analysis of the data used by Forget, controlling for "pre-trends," and found that the reduction in hospitalizations was part of a long-term trend and not due to the Mincome benefits.

***Psychological and mental health.*** The results in this category were more conclusive, especially from the newer experiments (B-Mincome, Finland, and SEED). The two studies of the Dutch experiments did not find significant results, as was the case with the economic and material outcomes, which again may be due to the similarity of the intervention to the existing social assistance programs in the eight Dutch sites.

The older U.S. NIT experiments did not find improvements in psychological outcomes. The three included studies actually found a few adverse results, although these may also have been due to chance, considering the large numbers of subgroup analyses that were conducted on numerous outcome variables.

**Social outcomes.** Overall, the included studies did not yield many significant or conclusive results for social engagement. There were increases in some aspects of social integration in the New Jersey experiment, but they were not consistent (i.e., observed either at the midpoint or endpoint, but not both). In B-Mincome, there was a reduction in the

probability of volunteering for participants who received GBI benefits and who were not assigned to an activation policy (mandatory or optional).

In the Mincome saturation site of Dauphin, Manitoba, significant reductions in crime rates were found, especially for property crimes. While only about 20% of the residents enrolled and received the NIT benefits, crime rates are higher in low-income settings and most of the recipients were residents with low incomes, so it is conceivable that the GBI benefits reduced the economic motives for people who may otherwise have committed break-and-enter and auto thefts (Calnitsky 2021).

**Educational outcomes.** GBI interventions did not appear to have significant effects on academic performance, other than in the Gary experiment where the largest improvement in reading test scores in grades 4 to 6 was found for children from the lowest income families (less than half of the official poverty level). The limited duration of the experiments may limit the ability to assess whether GBI can affect academic performance, as success in higher grades may even depend on the level of poverty in early childhood.

The results for post-compulsory school continuation were more compelling, with all five studies finding that more children stayed in school longer after the compulsory age for school attendance. McDonald 1979 reported results by income level and found a significant increase for males from families with incomes below the NIT breakeven amount. The intervention group also included families with higher incomes to avoid truncation bias; however, they would not have received NIT benefits unless their incomes decreased during the experiment. As such, the findings for the low-income group are more relevant to this review.

The Todeschini 2019 study found an increase in post-compulsory education in the group that received benefits unconditionally, without a mandatory or optional activation policy ("cash transfer only"). The result was reported as significant at the 10% level (calculated  $d = 0.09$ , 95% CI: -0.07 to 0.25), which isn't a strong finding on its own, but that

adds to the evidence from the other four studies, which was statistically significant at the 5% level.

School continuation is an important result for poverty reduction because the high-school dropout rate is much higher for children from low-income families (NCES, 2017), and the amount of income that people earn after graduating is highly correlated with their level of education. For example, the median of full-time earnings of 25- to-34-year-olds in the U.S. who had not completed high school was \$29,800 in 2020, which is exactly one half of the \$59,600 median earned by the same age group with a bachelor's degree (NCES, 2021). Thus, if GBI benefits allow children to stay in school longer, the long-term effects on poverty reduction may be substantial.

**Individual choice and agency.** The effects in this category were not statistically significant overall for whole study samples, although there were some differential effects found when subgroup results were examined, as described in the following section.

**PROGRESS-Plus factors.** Considering the socioeconomic determinants of poverty, the included experiments and studies did not investigate subgroup effects to a large extent. Interestingly, the older experiments seemed to consider differential effects across subgroups more than the newer ones; however, the choice of measures in the 1970s experiments is somewhat outdated now (e.g., "occupational prestige"), as are the gender references (e.g., two-parent families referred to as male-headed) and the division by race and ethnicity (e.g., Black, Spanish-speaking, and white).

Some of the researchers involved with the design of the U.S. NIT experiments did recognize the limitations of the latter: "The white group is surely heterogeneous ethnically" (Long 1971, p. 95); however, all four of these experiments still operationalized race and ethnicity as 'white', 'Black', and sometimes a third choice depending on the U.S. setting (Puerto Rican, Chicano, or Hispanic).

The most frequent subgroup analyses that matched PROGRESS-factors were in the categories of place of residence, race/ethnicity, sex and gender, and socioeconomic position. In the Plus category, age was the most commonly considered factor.

Place of residence was usually considered when the experiment was conducted in multiple sites, which was the case for the older NIT experiments in the U.S. and Canada. Some of the sites in each experiment had higher rates of poverty, and the estimated effects usually indicated larger improvements for some outcomes (quality of dietary intake, academic test score, absence from school and comportment, value of car owned).

Findings across race and ethnicity were generally inconsistent, with some exceptions. In the Seattle-Denver experiment, white youths were found to stay in school longer than non-white youths, which may reflect the additional obstacles to education for non-white youths aside from economic constraints. Since this experiment was conducted (1971-1976), dropout rates for non-white children in the U.S. have fallen by more than half (NCES, 2019) so the experimental result may no longer be relevant. In the Bonilla (2019) study of B-Mincome, self-rated life satisfaction was found to be higher among participants with non-EU ethno-cultural backgrounds. This may be due to worse overall poverty in the countries from which they originated being their point of reference.

In terms of gender and sex, the B-Mincome study also found significantly higher self-rated life satisfaction among women than men, although the study authors do not elaborate on possible reasons for this. The Canada public pension study found that men were less likely to be food insecure than women after receiving the GBI-like pension. The Calnitsky (2019) study on Mincome in Canada found that women receiving GBI benefits reported that they were less likely to work for reasons related to job/work conditions or choosing to pursue education. In 2022, the median hourly wage for women in Canada was 83.7% of the median for men (Statistics Canada, 2023), so the result from Mincome may still hold today, that

women would make use of GBI benefits to attain a higher level of education and find better paying jobs.

The differential effects across socioeconomic position were based on the extent of financial constraints: higher incomes and more assets (e.g., home ownership) were associated with less food insecurity, less non-home debt, higher values of appliances and cars, and greater life satisfaction.

The Plus factor of age was not found to significantly affect the magnitude or direction of outcomes, other than in reduced social integration with higher age, and more participants aged 26 to 49 giving the reason for not working as "did not want to work". Both of these findings were from NIT experiments in the 1970s, so it is uncertain if they can be generalized to the present time.

### ***Overall completeness and applicability of evidence***

In general, the evidence from the included experiments and studies is directly relevant to the reduction of poverty using guaranteed basic income approaches. All the reported outcomes relate to different aspects of poverty - economic, health-related, psychological, social, and individual. What we did not anticipate was the great diversity in the outcome variables examined and reported in these experiments and studies. As such, the evidence base is expansive but very 'thin', with most outcome variables reported in only one study. Taken as a whole though, the body of evidence still suggests that GBI interventions can lead to favourable outcomes in regard to poverty reduction.

Because of the potentially confounding impacts of the COVID-19 pandemic, we excluded studies on experiments conducted since March 2020. One of the included studies (West 2021) examined the first year of the Stockton Economic Empowerment Demonstration (SEED) experiment, which ended in February 2020. The final report (West & Castro, 2023) of the entire two-year experiment was published recently; however, the data were analyzed in separate stages for the first year and the second (March 2020 to February 2021). The second

stage addressed “COVID questions” and the associated “environmental, and health threats” (p. 228), and thus was not within the scope of this review, which examined GBI interventions that could inform long-term policies and programs for reducing poverty.

### *Quality of the evidence*

Based on the GRADE assessments of the included outcomes, the quality of the evidence is moderate to low, as shown in Table 4.12. We assessed the two primary outcomes and five secondary outcomes which were examined in more than one included study. This comprised the maximum of seven outcomes to include in a summary of findings table (Schünemann 2019).

In addition to being reported in multiple studies, the five secondary outcomes were selected on the basis of relevance to the present time, so at least two studies that reported the outcome had to be relatively recent. For example, three of the NIT experiments from the 1970s examined grade point averages of youths, but the results may not be applicable to the present time because the welfare program that the control groups were eligible for, Aid to Families with Dependent Children (AFDC), was less stringent than the current Temporary Assistance for Needy Families (TANF), introduced in 1996 (Parolin 2021).

The primary outcome of food security level was reported in two studies, one using an RCT design (Todeschini 2019), and the other using a repeated cross-sectional design (McIntyre 2016a). In GRADE assessments, non-randomized studies are normally given an initial rating of 'low' (i.e., downgraded two levels from 'high') because of "the inherent risk of bias associated with the lack of randomization, namely confounding and selection bias" (Schünemann 2019, p. 391). However, we assessed the risk of bias in these two domains as being low in the McIntyre study, so we assigned an initial rating of 'high' for the quality of evidence for the food security outcome, and then arrived at a final rating of 'moderate' as described in Table 4.12.

None of the included studies reported results for second primary outcome: poverty level measured using official, national, or international measures. Therefore, the summary of findings table contains six of the 176 eligible outcomes reported in the included studies. For the other 170 outcomes, GRADE assessments would have yielded ratings of either low or very low for each one. This is due to two reasons: risk of bias concerns and inconsistency across studies, the latter of which cannot be determined based on only one or two studies. Each of these two reasons reduces the GRADE rating by one level, so ratings of high or moderate certainty were not attainable for these studies. Additionally, imprecision (i.e., wide confidence intervals) of some of the effect estimates would have further reduced the rating from 'low' to 'very low'. Thus, it would not have been productive to conduct and report individual assessments for each of the 170 outcomes.

**Table 4.12***Summary of Findings and GRADE Ratings*

Outcomes	Anticipated absolute effects (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
Self-reported food insecurity Assessed with: interview/survey Follow-up: range 2 to 4 years	Two studies found a reduction in food insecurity. 1 RCT: calculated SMD of 0.41 (95% CI: 0.26, 0.57) 1 retrospective cohort study: calculated SMD of 0.57 (95% CI: 0.49, 0.65)	5030 (1 RCT, 1 NRS)	⊕⊕⊕○ Moderate <sup>1,2</sup>	Upgraded by one level due to very large estimated effects in both studies. Pooling/meta-analysis was not possible for this outcome because of different study designs.
Poverty level Assessed with: official/national or international poverty measures		(0 studies)	-	None of the included studies reported this outcome.
Self-rated physical health Assessed with: interview/survey Follow-up: range 12 months to 2 years	1 of 4 studies found a significant improvement, compared to controls	3169 (4 RCTs)	⊕⊕⊕○ Moderate <sup>3</sup>	Pooling/meta-analysis was not possible for this outcome because of different GBI interventions (2 studies provided supplemental GBI, 2 studies provided GMI with partial withdrawal).

<sup>1</sup> The retrospective study (using health system records) had a low risk of bias, the RCT had a high risk of bias due to potentially high measurement and analysis biases.

<sup>2</sup> Interventions delivered differently and in different settings.

<sup>3</sup> 1 study with moderate overall risk of bias, 2 studies with high risk of bias in 2 of 7 domains, 1 study with high risk in 4 of 7 domains.

Outcomes	Anticipated absolute effects (95% CI)	Nº of participants (studies)	Certainty of the evidence (GRADE)	Comments
Self-rated mental distress Assessed with: interview/survey Follow-up: range 1 to 2 years	Pooled SMD is 0.25 SD lower versus control group (0.37 lower to 0.13 lower)	1958 (2 RCTs)	⊕⊕○○ Low <sup>4</sup>	
Overall life satisfaction and subjective well-being Assessed with: interview/survey Follow-up: range 16 months to 2 years	2 of 3 studies found a significant improvement compared to controls	2844 (3 RCTs)	⊕⊕⊕○ Moderate <sup>5,6</sup>	Pooling/meta-analysis was not possible for this outcome because of different GBI interventions (1 study provided supplemental GBI, 2 studies provided GMI with partial withdrawal).
Subjective financial well-being Assessed with: interview/survey Follow-up: range 1 to 2 years	3 of 4 studies found significantly improved subjective (self-reported) financial well-being, compared to controls	3169 (4 RCTs)	⊕⊕○○ Low <sup>7,8</sup>	Pooling/meta-analysis was not possible for this outcome because of different GBI interventions (2 studies provided supplemental GBI, 2 studies provided GMI with partial withdrawal).

<sup>4</sup> 1 study with high risk in 2 of 7 domains, 1 study with high risk in 4 of 7 domains.

<sup>5</sup> 1 study with moderate overall risk of bias, 2 studies with high risk of bias in 2 of 7 domains.

<sup>6</sup> There is considerable heterogeneity among the three results; however, this is likely due to differences in the interventions (i.e., GBI benefits were of various monetary amounts).

<sup>7</sup> 1 study with moderate overall risk of bias, 2 studies with high risk in 2 of 7 domains, 1 study with high risk in 4 of 7 domains.

<sup>8</sup> High degree of heterogeneity (Chi<sup>2</sup> = 26.89 (P < 0.00001), I<sup>2</sup> = 93%).

Outcomes	Anticipated absolute effects (95% CI)	Nº of participants (studies)	Certainty of the evidence (GRADE)	Comments
Post-mandatory school continuation Assessed with: interview/survey or educational system records Follow-up: range 2 to 4 years	4 of 5 studies found significantly higher post-mandatory school enrollment (after age 16 or 17) for youth from families receiving the intervention, versus control groups.  1 study found a larger effect for boys, 1 study found a larger effect for girls. The other studies did not report results by sex or gender.	Total N not available (4 RCTs, 1 NRS)	⊕⊕⊕○ Moderate <sup>9,10</sup>	Upgraded by one level due to large estimated effect in 3 of 5 studies.  2 studies used school board data, 3 studies used interview/survey data. Pooling/meta-analysis was not possible for this outcome because sample sizes were not reported by study group (2 studies reported the total sample sizes (N), 2 studies reported the number of families in the experiment, 1 study reported total numbers of observations across all time points).

<sup>9</sup> 1 study with high risk in 2 of 7 domains, 1 study with high risk in 3 of 7 domains, 2 studies with high risk in 6 of 7 domains.

<sup>10</sup> Sample sizes were not reported by study group (n) or at all (unreported sample size, N). Two studies gave total sample sizes that were not large (N=138 and N=266).

### *Limitations and potential biases in the review process*

The strategies used to identify studies through published articles and sources as well as through grey literature were thorough and exhaustive. We ran comprehensive and sensitive searches across 16 databases, and we consulted various other resources, including websites of specific conferences, organizations, and governments. In addition, hand searching, and citation searching were done to ensure that as many relevant studies as possible could be identified. However, we acknowledge that search strategies and techniques are prone to subjectivity and may have been designed differently, which means that some studies could have been missed. Nevertheless, we do feel confident that the approaches used to identify studies were rigorous and comprehensive. These approaches were all done between May and December 2022, and we do recognize that newer studies published since January 2023 may not have been included in this current review.

Half of the included experiments were completed over 40 years ago, so we were unable to acquire some of the full-text articles that were cited in secondary sources, such as overview articles and summary reports on the experiments. Although efforts were made to request these items via inter-library loan, some materials were still not accessible. It is not clear why some of the primary sources were no longer available in electronic form while others were. Possibly there is a 'survivor' bias at play, such that the more interesting articles have survived and have been digitized.

The availability of articles on the older experiments also depended on the particular experiment. For example, we were able to obtain hard copies of the final report of the New Jersey experiment in book form (Kershaw & Fair, 1976a, 1976b), in which some individual chapters were the primary research output. We also found a digitized, online version of the Seattle-Denver final report (SRI International, 1983), which also contained some primary research reports. For the Gary and Rural/RIME experiments, we were only able to locate primary sources in the form of journal articles that were available online.

One of the major limitations to the strength of this review's findings was the high risk of bias in most of the included studies, which was due to high rates of attrition, subjective (self-reported) and unblinded measurements, and the absence of pre-analysis plans for most of the studies. This, combined with the sparse number of studies for each type of GBI, means that the reported findings should be considered with caution.

### ***Agreements and disagreements with other studies or reviews***

As mentioned above, we excluded studies of interventions, policies, or programs that would not resemble a full-scale GBI program. Other reviews tended to cast a wider net and included interventions, programs, and policies that were conditional on participation in specific activities, not paid regularly (e.g., lottery winnings) and not paid in fixed or predictable amounts (e.g., dividends from natural resources or casinos).

We included only primary research articles to obtain accurate and complete quantitative and statistical data for each eligible study. Other reviews included secondary sources, which we examined but found to be lacking in the level of quantitative detail necessary to conduct meta-analyses.

In a synthesis of other reviews, Hasdell (2020) notes the differences between the features of interventions in empirical studies and those of a universal basic income (UBI) and proposes that modelling studies may help to predict the effects of a UBI for specific populations and contexts. Most of the other reviews that we found also refer to the lack of empirical evidence on interventions that include all the features of UBI as evidence gaps. Our review focuses on GBI approaches as they have been tested in experiments and how the various types of GBI impact poverty-related outcomes.

Yang (2021) refers to "nebulous" basic income definitions, which appear to be based on a mix of UBI and GBI criteria. We developed a typology based on empirical and conceptual variants of GBI (the latter also being implemented in new experiments), and we believe that this framework can be adapted to classify proposed variants of UBI also. This

may help to clarify and to 'name' the different types of proposals, so that discussions and debates revolve around the same concepts.

## **Authors' conclusions**

### ***Implications for practice and policy***

High-income countries that offer stringent, conditional social assistance programs have not been successful in their goal of reducing poverty by transitioning benefit recipients to paid work. This is evidenced by the escalation in food bank use since these programs were introduced. Therefore, improvements in the social safety net are needed, and a guaranteed basic income may be part of the solution.

The existing body of research on guaranteed basic income provides some evidence that unconditional income support has a beneficial effect on several poverty-related outcomes. However, because the evidence is limited, a cautious approach is necessary.

Opponents of subsistence-level GBI proposals argue that they would be unaffordable and may also be detrimental for some people because their GBI benefits may be lower than the total support they receive from various existing programs. It is also risky to generalize the findings of limited duration and dispersed RCT experiments that cannot provide information on long-term or community-level effects. As well, because of the complexities of and differences between the various GBI approaches that we identified, actual full-scale programs may be implemented differently from the experimental GBI interventions. This potential departure was noted by researchers involved in the Seattle-Denver experiment in the 1970s: "What ultimately comes out as welfare reform [...] will not correspond specifically to any treatment that has appeared in any income maintenance [experiment] to date" (Bell et al., 1979, p. 49).

Based on the findings that we could compare across the reviewed experiments and studies, the strongest evidence of improvements in poverty-related outcomes appears to be

from interventions that provided a supplemental fixed-amount type of GBI. Two of the experiments used this approach: the Finnish basic income experiment and the Stockton Economic Empowerment Demonstration (SEED), providing amounts of €560 and USD500, respectively, which were not affected by other income.

Providing a supplemental GBI would also help to address the gaps between existing programs that target specific populations, especially those that exclude employed people with precarious low-income jobs. The supplemental approach could also lead to an eventual transition from conditional programs with intrusive, labour-intensive monitoring, to a simpler income-tested approach, if providing benefits with "no strings attached" is found to yield positive individual and community-level results.

### ***Implications for research***

In light of the large number of GBI experiments that are now underway or will begin in the near future, we believe that the typology of GBI approaches presented in this review will be helpful for evaluating and synthesizing the findings of these experiments.

Another major challenge in synthesizing the results of past research is the large number of outcome variables that have been examined and reported. For research that is still in the planning phase or will be planned in the future, it would be very helpful for researchers to use standardized instruments for assessing the various dimensions of poverty, such as the HFSSM for food insecurity (USDA 2022), the K10 for mental health (Kessler 2002), and the updated Material Deprivation (MD) Index for economic hardship (Guio 2017).

Providing financial assistance to people experiencing poverty affects every aspect of their lives, so it is understandable why past studies have collectively examined close to 200 outcome variables. Using validated instruments that are commonly used in the fields of health, sociology, and economics would help to yield findings that can be compared within studies as well as to population statistics, to provide absolute measures of the effects of GBI.

It may also be helpful to avoid investigations of general health, as poverty may only impact specific conditions or illnesses, so measures of overall state of health may not be sensitive enough to detect more nuanced effects. Gregory and Coleman-Jensen (2017) found that low income was associated with increased rates of three of ten chronic illnesses (stroke, asthma, and chronic obstructive pulmonary disease), so it may be informative to examine possible impacts of GBI interventions on these conditions. Also, because of the psychological stresses associated with financial constraints, it would be important to examine whether GBI interventions can have a beneficial impact on any of the six leading causes of death which are related to stress: cancer, coronary heart disease, accidental injuries, respiratory disorders, cirrhosis of the liver and suicide (Salleh, 2008). Hospital separations for “accidents and injuries” were examined by Forget (2011, 2013); however, this study looked only at community-level effects in one arm of the Mincome experiment (i.e., the Dauphin ‘saturation’ site).

Lastly, because of the disproportionate levels of poverty experienced by some groups, it may be helpful to examine the impacts of GBI interventions across PROGRESS-Plus factors in a more comprehensive way than in previous studies. To assist researchers, guidance for reporting equity-relevant randomized studies has been published (CONSORT-Equity; Welch et al., 2017), while a guideline for reporting equity-relevant observational studies is currently under development (STROBE-Equity; Funnell et al., 2023).

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## **Declarations of interest**

AR led this review as part of her doctoral thesis on poverty, food insecurity, and guaranteed basic income.

VW is editor-in-chief and acting CEO of the Campbell Collaboration. VW will not be involved in the editorial decision process for this review.

BJS was the principal investigator in the development of the AMSTAR 2 guideline.

OM co-authored a series of reviews on interventions for people experiencing homelessness, two of which considered income interventions (Aubry 2020; Moledina 2021).

The other authors of this review declare no conflicts of interest.

## **Plans for Updating this review**

We plan to update this review 4 years after publication. If this is not possible for some reason, the lead author will communicate this to the Social Welfare Coordinating Group.

Because of the nature of the interventions being examined (cash transfers to low-income individuals), the confounding effects of pandemic relief measures, and the economic upheaval that ensued (including rapid price inflation), we propose a two-stage approach to the analyses in the updated review, examining studies separately according to when they were

started (e.g., before or after 2024). This approach may help ensure a more meaningful interpretation of the findings.

## **Sources of support**

### *Internal sources*

- No sources of support provided.

### *External sources*

- No sources of support provided.

## **Differences between protocol and review**

### *Study eligibility*

During the pilot phase of the full-text screening process, we refined our inclusion and inclusion criteria in two ways. For study design, we decided to exclude simulation and predictive modelling studies, and only include studies with analyses and findings based entirely on empirical data. Secondly, the question came up as to the minimum number of benefit payments that would qualify as 'regular' according to our definition of GBI. Because we didn't specify any limits for the duration of follow-up, we decided on three as the minimum number of payments that we could consider as regular.

### *Supplementary searches*

We added another strategy for hand searching grey literature: we searched Google Scholar for reviews (since 2017) of basic income studies, to scan their bibliographies for GBI studies we may have missed. This search also yielded two reviews (Chrisp 2022, Somers 2021) that were added to the list of other reviews in section 1.4 (Why it is important to do this review).

The protocol noted that the website of the government of Italy did not have an English search option. We found the same for the website of the government of France, so their website link was removed from the list of G7 government sites that were checked.

We stated in the protocol that we would contact the authors of the included studies, to ask if they knew of any other GBI studies that we hadn't already identified. However, because of the highly publicized nature of GBI experiments, spanning the areas of politics, economics, public health, social advocacy, among others, we were confident that we had identified all the eligible GBI experiments through academic databases and grey literature/Internet searches. Using these strategies, we reached a 'saturation point', after which we only came across the same studies that were already included. As well, due to our specific and restrictive inclusion criteria (more so than in other GBI reviews), we expected that we would receive many suggestions for studies and secondary sources that we had already excluded, and we believed this would have been an unproductive use of time for both the study authors and the review authors.

### ***Data extraction***

We stated in the protocol that we would pilot the extraction form with ten articles, and we did not specify how many reviewers would conduct the pilot. Instead, five reviewers extracted data from two articles each, resulting in five articles done in duplicate. We believe that this yielded sufficient feedback to improve the extraction form.

### ***Excluded poverty-related outcomes***

We extracted all outcome data from the included studies; however, we did not include some of the outcomes in the synthesis of results because, while these were associated with poverty in general (e.g., number of parents in a family), it was not clear if or how changes in these outcomes impacted poverty for the participants in the experiments. We also excluded employment-related outcomes (i.e., if participants worked more or less during the experiment) because it was not clear how transitioning between experimental GBI benefits

and low-paid work impacted on their experience of poverty. A complete listing of outcomes, included and excluded, is provided in Appendix 7 and Appendix 8, respectively.

### ***Subgroup analysis***

We had planned to conduct subgroup analyses according to the study design (cluster randomized controlled trials (cRCTs), controlled before and after (CBA), etc.), study duration (<2 years, 2-4 years, >4 years), generosity of GBI benefits (relative to the official poverty line), individual/household level payment modality, poverty level threshold for eligibility (e.g., income below official poverty line, no income threshold), and take-back rate if there is additional income from other sources. However, these analyses were not possible due to the diversity of outcome measures across different types of interventions.

### ***Reporting of the review findings***

Due to the relevance of the review topic to societal equity, we had planned to follow the PRISMA-Equity guideline extension (Welch 2012). However, after examining the body of evidence from the included studies, it was clear that, even though some of the studies assessed the impacts of GBI interventions across factors such as gender and race/ethnicity, the interventions were not intended to address inequities, but rather, poverty in general. The PRISMA-Equity guideline was intended for reviews of epidemiological studies addressing health inequities, which are due to systemic and structural barriers to healthcare. This review compared conditional social assistance ('usual care') and guaranteed basic income interventions. While there may be barriers to eligibility for marginalized populations with existing social assistance programs, this would require the examination of other studies which were not within the scope of this review.

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## Chapter 5: General Discussion

### Main Findings – Article 1

The first article in this thesis (Chapter 2) described a quantitative longitudinal study examining traditional and novel approaches of food banks in Ottawa, Canada. We investigated whether the various food bank approaches had an impact on food insecurity over an 18-month period, and we found that the two novel approaches were associated with less food insecurity. Participants who accessed food banks that allowed clients to choose their food items reported less food insecurity, on average (0.53 points on a 10-point scale), compared to those who accessed food banks that provided pre-packed hampers. As well, participants who accessed food banks integrated within a Community Resource Centre reported lower food insecurity (0.59 points on average), compared to those who accessed conventional stand-alone food banks.

Overall, the prevalence of severe food insecurity among participants decreased from 38.5% to 24.6% during the 18-month study. Most of this decrease appears to be due to participants transitioning from the severely to the moderately food insecure categories. Although food insecurity was lower overall at the end of the study, most participants still reported being moderately or severely food insecure in the last survey.

We also examined self-reported physical and mental health across the four waves of the study. We did not find any significant changes in perceived physical health. For perceived mental health, there was a small but statistically significant improvement between waves 1 and 4; however, we do not know if this due to the decrease in food insecurity over time or to one or more of specific food bank approaches, or to some other unobserved factor.

The overall low mental health scores of our participants underscored the importance of considering people who depend on food banks as a special subset of all food insecure people. Past research has shown that people who access food banks have lower incomes and are more likely to subsist primarily on social assistance benefits. Our study also showed that

the mental health of participants was much more compromised than that of the general population, especially for participants who reported being moderately or severely food insecure, who had mean mental health scores that were more than one standard deviation below the general population mean.

### **Main findings – Article 2**

The second article in this thesis (Chapter 3) described a qualitative follow-up study examining the experiences of eleven people who accessed food banks in Ottawa, Canada and who also participated in the longitudinal quantitative study in Chapter 2.

This study provided the longest duration of follow-up interviews with people who access food banks; previous studies were all conducted within six months of the initial interviews. The overall finding in our study was that the participants continued to rely on food banks over the long term and that little had changed in their lives with respect to food insecurity and food bank access during the 18-month study period.

All eleven participants described coping with compromised physical or mental health, which also elucidated the bidirectional association between poverty and health. Some of the participants described challenges in managing their health conditions due to living on a low income, while others described physical and psychological challenges that prevented them from finding employment.

### **Main Findings – Article 3**

The third article in this thesis (Chapter 4) was a systematic review on the effects of guaranteed basic income (GBI) on poverty-related outcomes in developed high-income countries, as defined by UN DESA (United Nations Department of Economic and Social Affairs, 2022). We conducted this review because GBI has been proposed as a potentially effective solution to poverty and food insecurity in these countries, which provide social assistance to people with limited incomes through a complex array of targeted and means-tested programs. These programs have several drawbacks, including low uptake, high

administrative costs, and insufficient benefit amounts. As well, sanctions for non-compliance (in the form of benefit reductions or interruptions) and the intrusive monitoring of recipients have been described as paternalistic. The requirements to demonstrate financial need, followed by regular monitoring, also evoke feelings of stigma and shame for recipients. Due to the unconditional nature of GBI, it has been proposed as a better alternative to current social assistance approaches because of much lower administrative costs and the elimination of policies that marginalize people experiencing poverty.

One of the main findings of our systematic review was that GBI is not a singular concept, but rather, it can be implemented in many different ways. Therefore, discussions and arguments about GBI can be frustrating since the concept in question has not been properly defined in advance. One of the objectives of our systematic review was to conduct quantitative meta-analyses of the effects of GBI interventions, and in doing so, we realized that there was no single ‘GBI’ intervention. This led to the development of a typology of GBI approaches so that we did not combine “apples and oranges” in our analyses. Based on empirical and theoretical considerations of how unconditional monetary benefits would be provided, we identified five types of GBI which have been or could be implemented. The studies included in our review operationalized four of the five GBI types. The fifth type – a subsistence level GBI regardless of other income – was based on theoretical conceptualizations of GBI in literature. We later discovered that new experiments using this approach had been planned. In fact, the Welsh basic income pilot, which provides £1,600 per month to eligible individuals, was launched in November 2022. When these new experiments are completed, empirical evidence will be available on all five GBI types.

Six of the ten experiments examined in our review tested the impacts of negative income tax (NIT) interventions, two experiments tested subsistence-level guaranteed minimum incomes (GMI, with full or partial withdrawal of benefits as other income

increases), and two experiments tested a supplementary or ‘partial’ GBI approach in which benefits are smaller and not affected by other income.

The main findings of our systematic review with respect to specific outcomes are discussed in the sections below.

### **Physical and Mental Health Effects**

Overall, the evidence from GBI experiments points to a greater impact on mental health than physical health. It is possible that the latter is impacted by changes in income, and associated increases or decreases in psychological stress, but the physical manifestations may take longer to develop.

Aggregate measures of health may miss problems that exist at a more granular level, such as for a specific condition or disease. In the SEED experiment, the overall health and wellbeing of the participants was assessed using the SF-36 survey (West et al., 2021), and a significant difference was not found between GBI recipients and controls. However, statistically significant differences were found when analyzing the responses for specific categories within the SF-36: emotional health, energy over fatigue, emotional wellbeing, and pain. The improvements for these outcomes also appear to be clinically significant, with  $d$  values of 0.37, 0.335, 0.332, and 0.283, respectively.

Most of the newer studies in our review found improvements in various psychological and mental health outcomes, when the GBI benefits were greater than through social assistance. The Dutch experiments provided the same amounts as social assistance, but without conditions such as training and job search requirements. The studies of the other recent experiments (since 2017) found improvements in cognitive functioning, self-rated psychological wellbeing, and self-rated mental health.

The results from the older experiments were mixed. The NIT experiments in the US from the late 1960s and the 1970s did not find statistically significant improvements in psychological and mental health outcomes. In fact, some adverse effects were found,

although they were not consistent across subgroups, experimental sites, or survey waves. It is possible that the more generous national welfare program of that period (Aid to Families with Dependent Children) provided enough of an income floor that the larger NIT benefits did not have a significant impact on measured outcomes such as financial worries, psychological distress, and perceived quality of life.

The newer experiments from Finland, Spain (B-Mincome), and the US (SEED) that found psychological and mental health improvements were conducted within a modern context of social assistance policies, which prioritize welfare-to-work initiatives. The participants in our food bank studies would have received this type of social assistance (if they were eligible for it) through the provincial Ontario Works (OW) program (<https://www.ontario.ca/page/ontario-works>). Because many of the participants also had poor mental health, they would likely have been eligible for the Ontario Disability Support Program (ODSP; <https://www.ontario.ca/page/ontario-disability-support-program>) instead of OW. We did not collect information on participants' sources of income in the quantitative food bank study; however, in the qualitative study, we ascertained from the interview responses that five participants were receiving social assistance (OW) benefits and three were receiving disability (ODSP) benefits.

Based on the income amounts reported in the quantitative study (which not all participants provided), the majority of respondents had monthly incomes between \$600 and \$1799, which covers the range of benefits provided by either OW or ODSP. This matches the 59% figure cited by Food Banks Canada as the percentage of people accessing food banks for whom social assistance benefits (general and disability supports) are the main source of income (Food Banks Canada, 2019a).

Several of the participants in our qualitative study who were receiving social assistance benefits described problems in affording adequate amounts of foods to meet their

dietary preferences or requirements. Some described cutting back on their meals so that their children had more to eat.

### **Education and Poverty**

In terms of its impact on youths, GBI seems to provide a better ‘safety net’ that offers protection from losing the opportunity to obtain a secondary-school education. Although attaining this level of education is intended for all children in high-income countries, children who experience poverty are not always able to take advantage of this opportunity if they must work to support themselves.

All five studies in our systematic review that examined school continuation after the compulsory schooling age found that youths stayed in school longer ( $p < 0.05$  in four studies,  $p < 0.1$  in the fifth) when families received GBI benefits. This is an important finding with respect to poverty reduction because low education level is strongly correlated with low income – for example, 25-to-34-year-olds in the U.S. who had not completed high school were found to have, on average, only half of the income of the same age group who had completed a bachelor’s degree. Additionally, the unemployment rate of those who had not completed high school was 11%, compared to 4% for those with a bachelor’s degree or higher (NCES, 2021). Therefore, it appears that prolonging the education of youths could have a major beneficial impact on poverty in the long term.

In addition to better paying and more secure employment, “benefits of education [...] also include wider advantages such as better health (Lleras-Muney 2005), higher life satisfaction (Powdthavee, Lekfuangfu, and Wooden 2015), reduced criminal behavior (Lochner 2020), and greater civic participation (Lochner 2011)” (as cited in Blanden et al., 2022).

In our quantitative food bank study, we found that 70.6% of the participants did not have a postsecondary certificate, diploma or degree, compared to 36.3% of all people in

Ottawa. If the receipt of GBI by families allowed youths to stay in school longer, the probability of needing assistance from food banks later in their lives would likely decrease.

### **Advantages of a Supplemental GBI Approach**

Due to the multiple dimensions of poverty, and the continuum that exists for each dimension, it would be impossible to calculate a full GBI that would provide a subsistence-level income that would eliminate poverty for everyone. Although a GBI using the guaranteed minimum income (GMI) approach is supposed to provide a livable income, the benefit amount would have to be based on the estimated total cost of basic needs, and that amount can vary from person to person. Some proposals for a livable income are based on the national poverty line; however, this threshold is income-based (even if it considers geographic variations in the cost of living) and is therefore not an accurate indicator of poverty on which to base a guaranteed income amounts. More generous GMI proposals include the costs of continuing education, entertainment, community participation, and vacations, which adds further complexity to determining appropriate GBI amounts. The negative income tax (NIT) approach has the additional limitation that the basic guaranteed amount is arbitrary in terms of what basic expenses it would cover, so people who are not able to work may receive less money than from existing social assistance, which would mean a deeper level of poverty for those people.

GBI approaches that are intended to provide a subsistence level of income are usually proposed as a replacement for existing general-support social assistance (i.e., income supports such as disability benefits would remain). However, it would be impossible to predict – and measure – if the new system met everyone's needs to a greater or lesser degree. As well, a 'wholesale reform' of the social safety net through the implementation of a subsistence-level GBI would be disruptive and risky, as it would cause unemployment for people working in social services (e.g., case workers and administrative staff), and

implementing a completely new program could entail startup problems with benefit payments that could be devastating for people without other sources of income.

Perhaps most importantly, the evidence on the effects of GBI interventions is limited, both because of the paucity of research for each type of GBI, and because the findings from experimental settings may not be applicable to a full-scale ‘real world’ program.

A supplemental type of GBI would avoid the problems above because it would be provided in addition to existing benefits, for which one of the primary criticisms is that they are insufficient. This approach would also alleviate the concerns of critics who argue that a subsistence-level GBI would be unaffordable.

A supplemental GBI would be a safer way of introducing an unconditional type of income support. Then, once implemented, if this approach is found to be effective in improving various poverty-related outcomes, then it could potentially act as a springboard for the expansion of unconditional programs and the gradual replacement of conditional ones.

### **Guaranteed Basic Income and Food Bank Access**

The examination of food bank access is critical in exploring solutions to poverty and food insecurity through the provision of a guaranteed income because: (i) poverty is very difficult to measure due to its multidimensionality and differences in individuals’ experiences; and (ii) the concept of food insecurity includes worrying about being able to afford enough food, whereas people who have to rely on food banks actually experience the deprivation of this basic need. Therefore, food bank access provides a more precise indicator of deep poverty than food insecurity alone.

According to the Market Basket Measure, the poverty rate in Canada declined by almost half, from 14.5% in 2015 to 7.4% in 2021 (Statistics Canada, 2021). During the same 6-year period, the number of Canadians accessing food banks in one month increased from 0.85 million to 1.3 million (Food Banks Canada, 2022). If a guaranteed basic income program was implemented in Canada (or other high-income countries), it would be crucial to

evaluate its impact on food bank access, in order to gauge the effectiveness of the program in alleviating deep poverty. If food bank access declined, then it would be important to determine which people still need to rely on food banks, even after receiving GBI benefits. This analysis may identify a particularly vulnerable population which is missed entirely by conventional income-based poverty measures.

## **Conclusion**

In recent decades, food banks have become the primary resource in Canada and other high-income countries for alleviating one of the basic aspects of poverty: food insecurity.

Our longitudinal quantitative and qualitative studies of food bank access in Ottawa, Canada provided additional evidence that food banks are invaluable to people who cannot afford to buy adequate amounts of the food they need to feed themselves and their families, but that food banks cannot solve the problem of food insecurity. This is especially true for people who have specific dietary needs due to compromised health. An effective solution for eliminating food insecurity would need to address its underlying causes.

Food banks offering novel approaches – integration within Community Resource Centres or providing choice models for clients – seem to be more effective at alleviating food insecurity, but they are still limited by the amount of cash donations and types of food they receive. As such, even choice models at food banks can only provide a limited choice. The key to ensuring adequate choice for everyone to meet their dietary needs and preferences can be gleaned from the definition of household food insecurity, which refers to financial constraints – that is, not having enough money. Thus, an effective solution must ensure that people have enough money to buy the food they need.

Food banks were originally established in Canada as temporary emergency resources in the 1980s during the economic recession of that decade. Since then, food banks have continued to proliferate – in Canada and in other high-income countries – which could be interpreted as an indication of a “perpetual emergency.” Although this term seems to be

paradoxical, it may actually be an accurate way to describe the experience of poverty and food insecurity. Most of the food banks in our study provided food assistance to clients only once a month, and social assistance benefits were also paid on a monthly basis, so participants described a cyclical monthly period of scarcity after these resources were depleted.

The participants we interviewed provided an overall impression that they were surviving by passing up on essential needs that they could not afford – for example, by skipping meals, not eating fresh fruits and vegetables all year (due to seasonal availability at food banks), and foregoing health services not covered by social assistance. All of these concessions seem to be such that they would not be needed if the participants' income was moderately higher, on the order of hundreds of dollars per month. A supplemental type of guaranteed basic income could provide this type of relief.

The potential impacts of a guaranteed basic income on food insecurity, food bank access, and the stress of living in poverty were succinctly summarized by participant #6 in our qualitative study, who described the effect of transitioning from social assistance to Canada pension benefits (approximately \$500 more per month):

“I'm more even keeled now [and] there's a certain peace of mind [...] It's still borderline poverty living, but once a month a cheque comes in and we go buy groceries.”

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### Appendix 1. Consolidated criteria for reporting qualitative studies (COREQ) checklist.

Domain 1: Research team and reflexivity	Section – Subsection – Paragraph No.
<b>Personal Characteristics</b>	
1. Interviewer/facilitator - Which author(s) conducted the interview or focus group?	Methods – Data Collection – Para 2
2. Credentials - What were the researcher's credentials?	Declarations – Author's Information
3. Occupation - What was their occupation at the time of the study?	Declarations – Author's Information
4. Gender - Was the researcher male or female?	Methods – Data Collection – Para 2
5. Experience and training - What experience or training did the researcher have?	Methods – Data Collection – Para 2
<b>Relationship with participants</b>	
6. Relationship established - Was a relationship established prior to study commencement?	Methods – Participants and Setting – Para 1
7. Participant knowledge of the interviewer - What did the participants know about the researcher? e.g., personal goals, reasons for doing the research?	Methods – Participants and Setting – Para 1
8. Interviewer characteristics - What characteristics were reported about the interviewer/facilitator? e.g., bias, assumptions, reasons, and interests in the research topic?	Declarations – Author's Information
<b>Domain 2: study design</b>	
<b>Theoretical framework</b>	
9. Methodological orientation and Theory - What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods – Data Analysis – Para 1
<b>Participant selection</b>	
10. Sampling - How were participants selected? e.g., purposive, convenience, consecutive, snowball	Methods – Participants and Setting – Para 1
11. Method of approach - How were participants approached? e.g., face-to-face, telephone, mail, email	Methods – Data Collection – Para 2
12. Sample size - How many participants were in the study?	Methods – Participants and Setting – Para 1

13. Non-participation - How many people refused to participate or dropped out? Reasons?	Methods – Participants and Setting – Para 1
Setting	
14. Setting of data collection - Where was the data collected? e.g., home, clinic, workplace	Methods – Data Collection – Para 2
15. Presence of non-participants - Was anyone else present besides the participants and researchers?	Methods – Data Collection – Para 2
16. Description of sample - What are the important characteristics of the sample? e.g., demographic data, date	Methods – Participants and Setting – Para 1
Data collection	
17. Interview guide - Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods – Data Collection – Para 1 (guide was tested in previous phase of study)
18. Repeat interviews - Were repeat interviews carried out? If yes, how many?	Methods – Participants and Setting – Para 1
19. Audio/visual recording - Did the research use audio or visual recording to collect the data?	Methods – Data Collection – Para 2
20. Field notes - Were field notes made during and/or after the interview or focus group?	n/a (phone interviews only, recorded, and transcribed verbatim)
21. Duration - What was the duration of the interviews or focus group?	Methods – Data Collection – Para 2
22. Data saturation - Was data saturation discussed?	Discussion – Limitations – Para 3
23. Transcripts returned - Were transcripts returned to participants for comment and/or correction?	n/r (not part of the methodology)
Domain 3: analysis and findings	
Data analysis	
24. Number of data coders - How many data coders coded the data?	Methods – Data Analysis – Para 1
25. Description of the coding tree - Did authors provide a description of the coding tree?	n/r (coding process is described in Methods – Data Analysis – Para 1)

26. Derivation of themes - Were themes identified in advance or derived from the data?	Methods – Data Analysis – Para 1
27. Software - What software, if applicable, was used to manage the data?	Methods – Data Analysis – Para 1
28. Participant checking - Did participants provide feedback on the findings?	n/r (not part of the methodology)
<b>Reporting</b>	
29. Quotations presented - Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g., participant number	Results (all subsections)
30. Data and findings consistent - Was there consistency between the data presented and the findings?	Results (all subsections, three main themes)
31. Clarity of major themes - Were major themes clearly presented in the findings?	Results (all subsections, three main themes)
32. Clarity of minor themes - Is there a description of diverse cases or discussion of minor themes?	n/a (not applicable to study objective)

*Note.* n/a = not applicable; n/r = not reported

## **Appendix 2. Food bank client interview guide.**

### **Experience and interactions at the food bank:**

1. Have you used the food bank in the past 6 months? If yes, how often did you go to the food bank?
2. How would you describe your overall experiences with the food bank over the past 6 months?
3. Have you noticed any changes at the food bank in the past 6 months? [changes in the food, volunteers, how it's run, people you interact with, anything at all]

### **Perceived diet & health:**

4. In the past 6 months, have there been any changes to your diet? Have you made any changes in the foods you usually eat?
5. Have there been any recent changes in your physical health?
6. Have there been any recent changes in things that affect your mental health? Has anything changed that affects your mood, stress, happiness, or anything else related to your mental well-being?

### **Social support:**

7. In the past 6 months, did you get involved in any new community programs? If so, could you please describe them? In what ways, if any, have these programs been helpful?
8. Have there been any other changes in your social support in the past 6 months?
9. What kinds of support, services, or programs, if any, would be most helpful for you right now?

### **Background and life circumstances:**

10. Over the past 6 months have you experienced any major life changes? E.g., changes in where you live, your employment or income source, or anything else major?

### **Closing reflection:**

11. Is there anything else you would like to share with us?

### Appendix 3. Complete search strategy

The following databases were searched on May 16 or May 17, 2022:

- APA PsycInfo (Ovid) – 387 results
- Academic Search Complete (EBSCOhost) – 2125 results
- Business Source Complete (EBSCOhost) – 2785 results
- CENTRAL (Ovid) – 73 results
- CINAHL (EBSCOhost) – 542 results
- EconLit (EBSCOhost) – 3080 results
- Embase (Ovid) – 761 results
- Global Health (EBSCOhost) – 487 results
- International Bibliography of the Social Sciences (ProQuest) – 2911 results
- International Political Science Abstracts (EBSCOhost) – 236 results
- MEDLINE (Ovid) – 610 results
- PAIS Index (ProQuest) – 1198 results
- ProQuest Dissertations & Theses Global (PQDT) – 1014 results
- Sociological Abstracts (including Social Services Abstracts; ProQuest) – 2341 results
- Web of Science (various indexes; Clarivate) – 4745 results
- Worldwide Political Science Abstracts (ProQuest) – 1181 results

The following strategies were used for each database.

#### APA PsycInfo (Ovid)

1. ("basic income").ti,ab.
2. ((guarantee\* or universal\*) adj2 (income or allowance\*)).ti,ab.
3. (minim\* adj2 income).ti,ab.
4. (citizen\* adj2 (income or dividend\*)).ti,ab.
5. ("negative income tax\*").ti,ab.
6. (optimal adj2 income).ti,ab.
7. (income adj2 maintenance).ti,ab.
8. (unconditional adj2 (cash or transfer\*)).ti,ab.
9. mincome\*.ti,ab.
10. demogrant\*.ti,ab.
11. or/1-10

**Academic Search Complete (EBSCOhost)**

1. DE "income maintenance programs" OR DE "basic income" OR DE "negative income tax"
2. TI("basic income") OR AB("basic income")
3. TI((guarantee\* or universal\*) N2 (income or allowance\*)) OR AB((guarantee\* or universal\*) N2 (income or allowance\*))
4. TI(minim\* N2 income) OR AB(minim\* N2 income)
5. TI(citizen\* N2 (income or dividend\*)) OR AB(citizen\* N2 (income or dividend\*))
6. TI("negative income tax\*") OR AB("negative income tax\*")
7. TI(optimal N2 income) OR AB(optimal N2 income)
8. TI(income N2 maintenance) OR AB(income N2 maintenance)
9. TI(unconditional N2 (cash or transfer\*)) OR AB(unconditional N2 (cash or transfer\*))
10. TI(mincome\*) OR AB(mincome\*)
11. TI(demogrant\*) OR AB(demogrant\*)
12. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11
13. From results, limit to "Academic Journals" as "Source Type"

**Business Source Complete (EBSCOhost)**

1. DE "income maintenance programs" OR DE "basic income" OR DE "negative income tax"
2. TI("basic income") OR AB("basic income")
3. TI((guarantee\* or universal\*) N2 (income or allowance\*)) OR AB((guarantee\* or universal\*) N2 (income or allowance\*))
4. TI(minim\* N2 income) OR AB(minim\* N2 income)
5. TI(citizen\* N2 (income or dividend\*)) OR AB(citizen\* N2 (income or dividend\*))
6. TI("negative income tax\*") OR AB("negative income tax\*")
7. TI(optimal N2 income) OR AB(optimal N2 income)
8. TI(income N2 maintenance) OR AB(income N2 maintenance)
9. TI(unconditional N2 (cash or transfer\*)) OR AB(unconditional N2 (cash or transfer\*))
10. TI(mincome\*) OR AB(mincome\*)
11. TI(demogrant\*) OR AB(demogrant\*)
12. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11
13. From results, limit to "Academic Journals" as "Source Type"

**CENTRAL (Ovid)**

1. ("basic income").ti,ab.
2. ((guarantee\* or universal\*) adj2 (income or allowance\*)).ti,ab.
3. (minim\* adj2 income).ti,ab.
4. (citizen\* adj2 (income or dividend\*)).ti,ab.
5. ("negative income tax\*").ti,ab.

6. (optimal adj2 income).ti,ab.
7. (income adj2 maintenance).ti,ab.
8. (unconditional adj2 (cash or transfer\*)).ti,ab.
9. mincome\*.ti,ab.
10. demogrant\*.ti,ab.
11. or/1-10

### **CINAHL (EBSCOhost)**

1. TI("basic income") OR AB("basic income")
2. TI((guarantee\* or universal\*) N2 (income or allowance\*)) OR AB((guarantee\* or universal\*) N2 (income or allowance\*))
3. TI(minim\* N2 income) OR AB(minim\* N2 income)
4. TI(citizen\* N2 (income or dividend\*)) OR AB(citizen\* N2 (income or dividend\*))
5. TI("negative income tax\*") OR AB("negative income tax\*")
6. TI(optimal N2 income) OR AB(optimal N2 income)
7. TI(income N2 maintenance) OR AB(income N2 maintenance)
8. TI(unconditional N2 (cash or transfer\*)) OR AB(unconditional N2 (cash or transfer\*))
9. TI(mincome\*) OR AB(mincome\*)
10. TI(demogrant\*) OR AB(demogrant\*)
11. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10

### **EconLit (EBSCOhost)**

1. TI("basic income") OR AB("basic income")
2. TI((guarantee\* or universal\*) N2 (income or allowance\*)) OR AB((guarantee\* or universal\*) N2 (income or allowance\*))
3. TI(minim\* N2 income) OR AB(minim\* N2 income)
4. TI(citizen\* N2 (income or dividend\*)) OR AB(citizen\* N2 (income or dividend\*))
5. TI("negative income tax\*") OR AB("negative income tax\*")
6. TI(optimal N2 income) OR AB(optimal N2 income)
7. TI(income N2 maintenance) OR AB(income N2 maintenance)
8. TI(unconditional N2 (cash or transfer\*)) OR AB(unconditional N2 (cash or transfer\*))
9. TI(mincome\*) OR AB(mincome\*)
10. TI(demogrant\*) OR AB(demogrant\*)
11. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10

### **Embase (Ovid)**

1. ("basic income").ti,ab.
2. ((guarantee\* or universal\*) adj2 (income or allowance\*)).ti,ab.

3. (minim\* adj2 income).ti,ab.
4. (citizen\* adj2 (income or dividend\*)).ti,ab.
5. ("negative income tax\*").ti,ab.
6. (optimal adj2 income).ti,ab.
7. (income adj2 maintenance).ti,ab.
8. (unconditional adj2 (cash or transfer\*)).ti,ab.
9. minincome\*.ti,ab.
10. demogrant\*.ti,ab.
11. or/1-10

### **Global Health (EBSCOhost)**

1. TI("basic income") OR AB("basic income")
2. TI((guarantee\* or universal\*) N2 (income or allowance\*)) OR AB((guarantee\* or universal\*) N2 (income or allowance\*))
3. TI(minim\* N2 income) OR AB(minim\* N2 income)
4. TI(citizen\* N2 (income or dividend\*)) OR AB(citizen\* N2 (income or dividend\*))
5. TI("negative income tax\*") OR AB("negative income tax\*")
6. TI(optimal N2 income) OR AB(optimal N2 income)
7. TI(income N2 maintenance) OR AB(income N2 maintenance)
8. TI(unconditional N2 (cash or transfer\*)) OR AB(unconditional N2 (cash or transfer\*))
9. TI(minincome\*) OR AB(minincome\*)
10. TI(demogrant\*) OR AB(demogrant\*)
11. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10

### **International Bibliography of the Social Sciences (ProQuest)**

1. TI,AB("basic income")
2. TI,AB((guarantee\* or universal\*) N/2 (income or allowance\*))
3. TI,AB(minim\* N/2 income)
4. TI,AB(citizen\* N/2 (income or dividend\*))
5. TI,AB("negative income tax\*")
6. TI,AB(optimal N/2 income)
7. TI,AB(income N/2 maintenance)
8. TI,AB(unconditional N/2 (cash or transfer\*))
9. TI,AB(minincome\*)
10. TI,AB(demogrant\*)
11. 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10
12. From results, limited to "Scholarly Journals OR Dissertations & Theses OR Other Sources OR Reports" as Source Types

**International Political Science Abstracts (EBSCOhost)**

1. TI("basic income") OR AB("basic income")
2. TI((guarantee\* or universal\*) N2 (income or allowance\*)) OR AB((guarantee\* or universal\*) N2 (income or allowance\*))
3. TI(minim\* N2 income) OR AB(minim\* N2 income)
4. TI(citizen\* N2 (income or dividend\*)) OR AB(citizen\* N2 (income or dividend\*))
5. TI("negative income tax\*") OR AB("negative income tax\*")
6. TI(optimal N2 income) OR AB(optimal N2 income)
7. TI(income N2 maintenance) OR AB(income N2 maintenance)
8. TI(unconditional N2 (cash or transfer\*)) OR AB(unconditional N2 (cash or transfer\*))
9. TI(mincome\*) OR AB(mincome\*)
10. TI(demogrant\*) OR AB(demogrant\*)
11. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10

**MEDLINE (Ovid)**

1. ("basic income").ti,ab,kf.
2. ((guarantee\* or universal\*) adj2 (income or allowance\*)).ti,ab,kf.
3. (minim\* adj2 income).ti,ab,kf.
4. (citizen\* adj2 (income or dividend\*)).ti,ab,kf.
5. ("negative income tax\*").ti,ab,kf.
6. (optimal adj2 income).ti,ab,kf.
7. (income adj2 maintenance).ti,ab,kf.
8. (unconditional adj2 (cash or transfer\*)).ti,ab,kf.
9. mincome\*.ti,ab,kf.
10. demogrant\*.ti,ab,kf.
11. or/1-10

**PAIS Index (ProQuest)**

1. MAINSUBJECT.EXACT("Income Maintenance Programs")
2. TI,AB("basic income")
3. TI,AB((guarantee\* or universal\*) N/2 (income or allowance\*))
4. TI,AB(minim\* N/2 income)
5. TI,AB(citizen\* N/2 (income or dividend\*))
6. TI,AB("negative income tax\*")
7. TI,AB(optimal N/2 income)
8. TI,AB(income N/2 maintenance)
9. TI,AB(unconditional N/2 (cash or transfer\*))
10. TI,AB(mincome\*)
11. TI,AB(demogrant\*)
12. 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11

13. From results, limited to "Scholarly Journals OR Reports OR Dissertations & Theses" as Source Types

**Sociological Abstracts (including Social Services Abstracts; ProQuest)**

1. MAINSUBJECT.EXACT("Income Maintenance Programs")
2. TI,AB("basic income")
3. TI,AB((guarantee\* or universal\*) N/2 (income or allowance\*))
4. TI,AB(minim\* N/2 income)
5. TI,AB(citizen\* N/2 (income or dividend\*))
6. TI,AB("negative income tax\*")
7. TI,AB(optimal N/2 income)
8. TI,AB(income N/2 maintenance)
9. TI,AB(unconditional N/2 (cash or transfer\*))
10. TI,AB(mincome\*)
11. TI,AB(demogrant\*)
12. 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11
13. From results, limited to "Scholarly Journals OR Dissertations & Theses OR Conference Papers & Proceedings OR Working Papers OR Other Sources" as Source Types

**Web of Science (Science Citation Index, Social Sciences Citation Index, Arts & Humanities Citation Index, Emerging Sources Citation Index, Conference Proceedings Citation Index – Science, Conference Proceedings Citation Index – Social Sciences & Humanities; Clarivate)**

1. TS=("basic income")
2. TS=((guarantee\* or universal\*) NEAR/2 (income or allowance\*))
3. TS=(minim\* NEAR/2 income)
4. TS=(citizen\* NEAR/2 (income or dividend\*))
5. TS=("negative income tax\*")
6. TS=(optimal NEAR/2 income)
7. TS=(income NEAR/2 maintenance)
8. TS=(unconditional NEAR/2 (cash or transfer\*))
9. TS=(mincome\*)
10. TS=(demogrant\*)
11. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10

## Search strategies used to identify other review articles

### *Cochrane Database of Systematic Reviews (Ovid)*

1. ("basic income").ti,ab.
2. ((guarantee\* or universal\*) adj2 (income or allowance\*)).ti,ab.
3. (minim\* adj2 income).ti,ab.
4. (citizen\* adj2 (income or dividend\*)).ti,ab.
5. ("negative income tax\*").ti,ab.
6. (optimal adj2 income).ti,ab.
7. (income adj2 maintenance).ti,ab.
8. (unconditional adj2 (cash or transfer\*)).ti,ab.
9. mincome\*.ti,ab.
10. demogrant\*.ti,ab.
11. or/1-10

### *Campbell Systematic Reviews (Wiley)*

- "basic income" OR "unconditional cash transfer" OR "unconditional cash transfers" OR "negative income tax" OR "guaranteed annual income"
- Two searches were done: one limiting results to keywords appearing in the title and the other limiting to the abstract.

### *Epistemonikos (Wiley)*

- "basic income" OR ((guarantee\* OR universal\*) NEAR/2 (income OR allowance\*)) OR (minim\* NEAR/2 income) OR (citizen\* NEAR/2 (income or dividend\*)) OR "negative income tax\*" OR (optimal NEAR/2 income) OR (income NEAR/2 maintenance) OR (unconditional NEAR/2 (cash or transfer\*)) OR mincome\* OR demogrant\*

### *Social Systems Evidence (<https://www.socialsystemsevidence.org/>)*

- "basic income" OR "unconditional cash transfer" OR "unconditional cash transfers" OR "negative income tax" OR "guaranteed annual income"

### *Google Scholar (<https://scholar.google.com>)*

- intitle:"basic income" OR intitle:"unconditional cash transfer" OR intitle:"unconditional cash transfers" OR intitle:"negative income tax" OR intitle:"guaranteed annual income" intitle:review OR intitle:meta
- Search results were limited to 2017 to 2022.

#### Appendix 4. Table of study inclusion and exclusion criteria

	Include	Exclude
Article type	Primary research	<ul style="list-style-type: none"> <li>- any literature that synthesizes, summarizes or refers to the results of primary research - e.g. reviews, compilations, news and magazine articles, editorials, opinion pieces, textbook chapters, blogs</li> <li>- proposals for studies, programs or policies</li> </ul>
Intervention	<p>Any cash transfer intervention for adults (18+ years old) that: (1) is unconditional, (2) has regular payment intervals, (3) provides a guaranteed minimum amount, and (4) provides fixed or predictable amounts</p> <p>Negative income tax (NIT) interventions are eligible if receipt of benefits is unconditional</p>	<ul style="list-style-type: none"> <li>- interventions that are conditional - e.g. require having or seeking employment, taking training courses, participating in educational or counselling programs, having children of a certain age, caring for adults, having a disability</li> <li>- unconditional cash transfers of amounts that vary by more than 10% during the study period due to changes in program funding/budget</li> <li>- interventions that provide in-kind benefits (e.g. food vouchers, store gift cards, paid courses/training)</li> </ul>
Study design	<p>Any design that collects quantitative or quantifiable data about the effects of GBI on recipients</p> <p>Multi-arm studies if one or more intervention arms meet the inclusion criteria</p>	<ul style="list-style-type: none"> <li>- simulations and predictive modelling (i.e. with no analysis of empirical data about GBI recipients)</li> <li>- cross-sectional studies using data from a single time point</li> <li>- interrupted time series (ITS) with less than three time points before and three time points after the intervention</li> <li>- qualitative studies - e.g. case reports, interviews, focus groups</li> <li>- process evaluations</li> </ul>

Setting	Any setting in high-income countries classified as developed by UN DESA*	Not in a developed high-income country*
Participants	Persons living in a developed high-income country (including children of GBI recipients)	People and organizations involved with the study but not receiving GBI benefits (e.g. program administrators and staff, businesses offering employment)

\*Developed high-income countries are listed in Table A of the Statistical Annex of *World Economic Situation and Prospects 2022* ([https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2022\\_ANNEX.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2022_ANNEX.pdf))

## Appendix 5. Data extraction template

General information	
Covidence ID#	
Reviewer's initials	
First author's last name and year	
Corresponding author's contact info	
Source (e.g. journal name, organization/government name)	
Publication type	Select from: journal article, report, other (please specify)
Country	Select from: Canada, Finland, France, Germany, Italy, Japan, Netherlands, United Kingdom, Spain, United States, other (please specify)
Region (city, state/province, or region described in study)	
Study start date (MM/YYYY)	
Study end date (MM/YYYY)	
Duration of follow-up (baseline to final measurement)	
Study objectives (if presented)	
Main conclusions (as reported)	
Funder	
Ethics approval	
Methods	
Study design	Select from: RCT, cRCT, before-after (w/o control), CBA, RDD, ITS, other (please specify)
Statistical methods used	(Can use article text with page numbers)
Number of intervention arms	
Description of intervention(s)	(Can use article text with page numbers)
Type of control/comparison	Select from: no intervention, other intervention, no control/comparison group, other control (please specify)
Allocation type	Select from: individual, household
Units of analysis	Individual, household and/or community level
Sociodemographic characteristics used to describe sample and/or compare groups at baseline	
Sociodemographic characteristics used in subgroup analyses of intervention effects.	

Population	
Setting (e.g. urban, low-income neighbourhood, rural)	
Age (mean, SD, range, as reported)	
Sociodemographic characteristics for eligibility in study	e.g. income below x, age between x and y, sex, released from prison
Reasons for exclusion from study (if reported)	
Total number of participants at baseline	
Number of participants in each group at baseline	
Number of participants in each group at end of study	
Number of participants lost in each group	
Outcomes	
Outcomes reported	e.g. food insecurity, subjective financial stress, education level, self-reported health, material deprivation index score
Method of assessment for each outcome	Type of scale, instrument, source of income data or health data, etc.
Validity of each measure (if reported)	
Timing of outcome assessment (e.g. baseline, 18 months, 36 months)	
Results	
Effect estimates reported for each outcome (Summarize separately for each intervention if multi-arm study)	e.g. mean difference and SD, <i>p</i> -value or confidence interval
(Note if reported effect estimates are adjusted for covariates)	
Type of effect estimate for each outcome	e.g. standardized mean difference, difference in differences, mean ratio, odds ratio (for dichotomous measures)
Statistically significant differences across subgroups for each outcome (and each intervention if multi-arm study)	

### Appendix 6. Studies excluded after the screening stage or during data extraction

Study	Reason for exclusion
Calnitsky 2017	Ambiguous poverty-related outcome (employment)
Choudhry 1995	Ambiguous poverty-related outcome (marital dissolution)
Choudhry 2001	Ambiguous poverty-related outcome (household transition dynamics)
Cogan 1983	Ambiguous poverty-related outcome (employment)
Greenberg 1983	Ambiguous poverty-related outcome (employment)
Groeneveld 1980	Ambiguous poverty-related outcome (marital dissolution)
Hannan 1977	Ambiguous poverty-related outcome (marital dissolution)
Heffernan 1977	Ambiguous poverty-related outcome (awareness of social services)
Hum 1992	Ambiguous poverty-related outcome (marital dissolution)
Keeley 1980a	Ambiguous poverty-related outcome (migration)
Keeley 1980b	Ambiguous poverty-related outcome (fertility)
Keeley 1987	Ambiguous poverty-related outcome (marital dissolution)
McDowell 2020	Ineligible study design (cross-sectional with one timepoint)
McDowell 2021	Ineligible study design (cross-sectional with one timepoint)
McIntyre 2016b	Ineligible study design (cross-sectional with one timepoint)
Pencavel 1982	Ambiguous poverty-related outcome (employment)
Robins 1980	Ambiguous poverty-related outcome (employment)
West 1980	Ambiguous poverty-related outcome (employment)

### Appendix 7. Included outcomes

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Bonilla 2019, B-Mincome (Barcelona)	Mental/psychological health	Life satisfaction	Life satisfaction	Self-rated, 0-10 scale	baseline (Oct 2017), 1 year, and ~21/22 months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – any reason	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – family	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – job/work conditions	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – unpaid vacation	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – education	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – did not want to work	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – ill or disabled	Study survey data	Baseline, 1 year, and 7 more times every four months

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – self- employed	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – retired	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2019, Mincome (Canada)	Individual choice and agency	Choice/agency	Reason for not working – other/unknown	Study survey data	Baseline, 1 year, and 7 more times every four months
Calnitsky 2021, Mincome (Canada)	Social outcomes	Anti-social behavior	Total crime rates	Uniform Crime Report data (UCR)	annual
Calnitsky 2021, Mincome (Canada)	Social outcomes	Anti-social behavior	Violent crime rates	Uniform Crime Report data (UCR)	annual
Calnitsky 2021, Mincome (Canada)	Social outcomes	Anti-social behavior	Property crime rates	Uniform Crime Report data (UCR)	annual
Calnitsky 2021, Mincome (Canada)	Social outcomes	Anti-social behavior	Other crime rates	Uniform Crime Report data (UCR)	annual
Elesh 1977, New Jersey, USA	Physical health	Child health (self- reported)	Number of hospital days (children)	Study survey data	2nd, 8th, and 12th quarters
Elesh 1977, New Jersey, USA	Physical health	Child health (self- reported)	Number of bed days (children)	Study survey data	2nd, 8th, and 12th quarters
Elesh 1977, New Jersey, USA	Physical health	Child health (self- reported)	Number of chronic illnesses (children)	Study survey data	2nd, 8th, and 12th quarters

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Elesh 1977, New Jersey, USA	Physical health	Physical health (self-reported)	Number of hospital days (husband and wife)	Quartely interviews	Pre-enrollment, 2nd, 6th, 10th quarters
Elesh 1977, New Jersey, USA	Physical health	Physical health (self-reported)	Number of chronic illnesses (husband and wife)	Quartely interviews	Pre-enrollment, 2nd, 6th, 10th quarters
Forget 2011, Mincome (Canada)	Education/training	School continuation	Grade 11/12 Enrolment	Department of Education	Unclear
Forget 2011, Mincome (Canada)	Mental/psychological health	Mental health (records data)	Hospital separations, non-congenital mental health	Manitoba Population Health Research Data Repository	ITS model, 6-month intervals from 1970 to 1985
Forget 2011, Mincome (Canada)	Physical health	Child health (administrative data)	Low birth weight	Manitoba Population Health Research Data Repository	Unclear
Forget 2011, Mincome (Canada)	Physical health	Child health (administrative data)	At-risk birth weight	Manitoba Population Health Research Data Repository	Unclear
Forget 2011, Mincome (Canada)	Physical health	Child health (administrative data)	Small-for-gestational age, newborns	Manitoba Population Health Research Data Repository	Unclear

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/source of data	Timing of assessment
Forget 2011, Mincome (Canada)	Physical health	Physical health (records data)	Total hospital separations (1978 vs 1973)	Manitoba Health Services Insurance Plan registry	Baseline (1973) and 5 years later
Forget 2011, Mincome (Canada)	Physical health	Physical health (records data)	Total hospital separations, all causes	Manitoba Health Services Insurance Plan registry	ITS model, 6-month intervals from 1970 to 1985
Forget 2011, Mincome (Canada)	Physical health	Physical health (records data)	Hospital separations, accidents and injuries	Manitoba Health Services Insurance Plan registry	ITS model, 6-month intervals from 1970 to 1985
Forget 2013, Mincome (Canada)	Mental/psychological health	Mental health (records data)	Hospital separations (mental health diagnoses)	Manitoba Health Services Insurance Plan registry	6-mo. periods beginning 1974
Forget 2013, Mincome (Canada)	Physical health	Physical health (records data)	Overall hospital separations	Manitoba Health Services Insurance Plan registry	6-mo. periods beginning 1974
Forget 2013, Mincome (Canada)	Physical health	Physical health (records data)	Hospital separations (accidents and injuries)	Manitoba Health Services Insurance Plan registry	6-mo. periods beginning 1974
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Bargaining and decision-making power ("voice") - on wife's job	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Bargaining and decision-making power ("voice") - on important decisions	Couples Survey	baseline, 2 years

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Bargaining and decision-making power ("voice") - who wins out	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Financial disagreement index (marital conflict/"loyalty")	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Financial disagreement (marital conflict/"loyalty") - have enough money	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Financial disagreement (marital conflict/"loyalty") - save or spend	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Non-financial disagreement index (marital conflict/"loyalty")	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Non-financial disagreement (marital conflict/"loyalty") - husband's habits	Couples Survey	baseline, 2 years

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Non-financial disagreement (marital conflict/"loyalty") - religious beliefs	Couples Survey	baseline, 2 years
Gonalons-Pons 2021, Mincome (Canada)	Individual choice and agency	Agency (wife)	Non-financial disagreement (marital conflict/"loyalty") - choice of friends	Couples Survey	baseline, 2 years
Groeneveld 1979, SIME-DIME, USA	Social outcomes	Anti-social behavior	Probability of delinquency - status offences	Police records/survey data	48/60 months
Groeneveld 1979, SIME-DIME, USA	Social outcomes	Anti-social behavior	Probability of delinquency - serious offences	Police records/survey data	48/60 months
Kaluzny 1979, Gary, USA	Economic/material	Non-food expenditures	Probability of becoming a homeowner	Study survey data	Baseline, 1 year, 2 year, 3 year
Kaluzny 1979, Gary, USA	Economic/material	Non-food expenditures	Rental expenditure	Study survey data	Baseline, 1 year, 2 year, 3 year
Kehrer 1979, Gary, USA	Physical health	Child health (administrative data)	Birth weight	Indiana State Board of Health records	Once (birth weight)
Kerachsky 1977, New Jersey, USA	Physical health	Health-related impairments/limitat ions	Illness Interfering With Work - Adults	Study survey data	Pre-enrollment, 2nd, 6th, 10th quarters

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Kerachsky 1977, New Jersey, USA	Physical health	Health-related impairments/limitat ions	Illness Preventing Work - Adult Males Only	Study survey data	Pre-enrollment, 2nd, 6th, 10th quarters
Kerachsky 1977, New Jersey, USA	Physical health	Physical health (self-reported)	Number of Times Entered Hospital - Adults	Study survey data	Pre-enrollment, 2nd, 6th, 10th quarters
Kerachsky 1977, New Jersey, USA	Physical health	Physical health (self-reported)	Illness Lasting More Than 3 months - Adults	Study survey data	Pre-enrollment, 2nd, 6th, 10th quarters
Ladinsky 1977, New Jersey, USA	Economic/material	Non-food expenditures	Lifestyle enhancement – value of appliances owned	Study survey data	Baseline (1st quarter), 6th quarter, 10th quarter
Ladinsky 1977, New Jersey, USA	Economic/material	Non-food expenditures	Lifestyle enhancement – value of cars owned	Study survey data	Baseline (1st quarter), 6th quarter, 10th quarter
Ladinsky 1977, New Jersey, USA	Economic/material	Non-food expenditures	Lifestyle enhancement – home improvements and repair	Study survey data	Baseline, 3rd quarter, 7th quarter, 11th quarter
Ladinsky 1977, New Jersey, USA	Individual choice and agency	Use of time - recreation and entertainment	Leisure Activities – parks and zoos, movies, restaurants, and bars	Study survey data	Baseline, 3rd quarter, 7th quarter, 11th quarter,
Ladinsky 1977, New Jersey, USA	Individual choice and agency	Use of time - recreation and entertainment	Leisure Activities – involvement in hobbies, sports activities, and vacations	Study survey data	Baseline, 7th quarter, 11th quarter,
Ladinsky 1977, New Jersey, USA	Social outcomes	Social engagement	Social Integration – giving financial aid to friend or relative	Study survey data	Baseline, 4th quarter, 8th quarter

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Ladinsky 1977, New Jersey, USA	Social outcomes	Social engagement	Social Integration – social visits	Study survey data	Baseline, 4th quarter, 8th quarter, 12th quarter
Ladinsky 1977, New Jersey, USA	Social outcomes	Social engagement	Social Integration – husband-wife	Study survey data	Baseline, 5th quarter
Ladinsky 1977, New Jersey, USA	Social outcomes	Social engagement	Social Integration – family	Study survey data	Baseline, 5th quarter
Ladinsky 1977, New Jersey, USA	Social outcomes	Social engagement	Social Integration – membership in organizations	Study survey data	Baseline, 5th quarter, 9th quarter
Ladinsky 1977, New Jersey, USA	Social outcomes	Social engagement	Social Integration – attendance at religious services	Study survey data	Baseline, 7th quarter
Lassander 2021, Finnish BI Experiment	Mental/psychological health	Subjective financial well-being	Subjective financial well-being (SFWB) - financial stress	Study survey data	2 years
Lassander 2021, Finnish BI Experiment	Mental/psychological health	Subjective financial well-being	Subjective financial well-being (SFWB) - financial management/control	Study survey data	2 years
Lassander 2021, Finnish BI Experiment	Mental/psychological health	Subjective financial well-being	Subjective financial well-being (SFWB) - financial freedom	Study survey data	2 years
Lassander 2021, Finnish BI Experiment	Mental/psychological health	Subjective financial well-being	Subjective financial well-being (SFWB) - emergency funds	Study survey data	2 years
Mallar 1977, New Jersey, USA	Education/training	School continuation	Probability of high school completion	Study survey data	3 years (end of the experiment)

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Mallar 1977, New Jersey, USA	Education/training	School continuation	Years of Schooling Attained	Study survey data	3 years (end of the experiment)
Mallar 1977, New Jersey, USA	Education/training	School continuation	College attendance	Study survey data	3 years (end of the experiment)
Manheim 1979, SIME-DIME, USA	Education/training	Absenteeism	School absences	School records and survey data	Seattle 1972-73; Denver 1973-74
Manheim 1979, SIME-DIME, USA	Education/training	Academic performance	Grade point average	School records and survey data	Seattle 1972-73; Denver 1973-74
Manheim 1979, SIME-DIME, USA	Education/training	Academic performance	Standardized test score	School records and survey data	Seattle 1972-73; Denver 1973-74
Maynard 1977, RIME, USA	Education/training	Absenteeism	Absenteeism	Unclear	“at the time of the most recent observations on any school performance measure”
Maynard 1977, RIME, USA	Education/training	Academic performance	Academic Grade Point Average	Unclear	“at the time of the most recent observations on any school performance measure”
Maynard 1977, RIME, USA	Education/training	Academic performance	Deviation from expected grade equivalent score on standardized achievement test	Unclear	“at the time of the most recent observations on any school performance measure”
Maynard 1977, RIME, USA	Education/training	Academic performance	Standardized achievement test score - Percentile Score	Unclear	“at the time of the most recent observations on any school performance measure”

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Maynard 1977, RIME, USA	Education/training	Comportment	Comportment grade point average	Unclear	“at the time of the most recent observations on any school performance measure”
Maynard 1979, Gary, USA	Education/training	Absenteeism	Days absent	Unclear	baseline, year 1, year 2, year 3 or 4
Maynard 1979, Gary, USA	Education/training	Academic performance	Reading test score	Unclear	baseline, year 1, year 2, year 3 or 4
Maynard 1979, Gary, USA	Education/training	Academic performance	Academic grade point average	Unclear	baseline, year 1, year 2, year 3 or 4
McDonald 1979, Gary, USA	Education/training	School continuation	School enrollment	Study survey data	3rd periodic interview, 2nd school year
McIntyre 2016a, Canada public pension	Economic/material	Food insecurity	Food insecurity	Household Food Security Survey Module (HFSSM)	2007-2008, 2009-2010, 2011- 2012, and 2013
Middleton 1977, New Jersey, USA	Mental/psychological health	Life satisfaction	Quality of life and aspirations	Modified from Cantril (1965)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Mental health (self- reported, single item)	Psychosomatic and nervous symptoms	Based on items appearing in Star (1950); Gurin, Vcroff, and Feld (1960); Srole et al. (1962); Leighton et al. (1963); and Langner (1962)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Mental health (self- reported, single item)	General happiness	Developed by researchers	Unclear

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Middleton 1977, New Jersey, USA	Mental/psychological health	Mental health (self- reported, single item)	Feeling of "nothing to do"	Developed by researchers	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Mental health (self- reported, single item)	Self-esteem	Modified from Rosenberg (1965)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Outlook	Community efficacy	Developed by researchers	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Outlook	Expectation of better job in future	Developed by researchers	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Outlook	Anomy	From McClosky and Schaar (1965)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Outlook	Control of future	From Strodtbeck (1958]	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Worries	Worry about money	Modified from Bradburn and Caplovitz (1965)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Worries	Worry about own health	Modified from Bradburn and Caplovitz (1965)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Worries	Worry about health of wife, children	Modified from Bradburn and Caplovitz (1965)	Unclear
Middleton 1977, New Jersey, USA	Mental/psychological health	Worries	Worry about raising children	Modified from Bradburn and Caplovitz (1965)	Unclear

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Middleton 1977, New Jersey, USA	Mental/psychological health	Worries	Worry about losing job	Modified from Bradburn and Caplovitz (1965)	Unclear
Muffels 2021, Dutch (Netherlands)	Individual choice and agency	Choice/agency	Perceived capabilities, freedom of choice	7-item question	16-24 months
Muffels 2021, Dutch (Netherlands)	Mental/psychological health	Life satisfaction	Life satisfaction and subjective well being (self-rated, 0-10 scale)	Study survey data	16-24 months
Muffels 2021, Dutch (Netherlands)	Mental/psychological health	Mental health (self- reported, composite score)	Mental health index (MHI-5)	MHI-5	16-24 months
Muffels 2021, Dutch (Netherlands)	Mental/psychological health	Subjective financial well-being	Financial stress and poverty	5-item question	16-24 months
Muffels 2021, Dutch (Netherlands)	Physical health	Overall physical health (self- reported)	Subjective health	Single item question (5 choice Likert scale)	16-24 months
Muffels 2021, Dutch (Netherlands)	Social outcomes	Social perceptions	Perceived extent of social integration	Study survey data	16-24 months
Muffels 2021, Dutch (Netherlands)	Social outcomes	Social perceptions	Social trust	Study survey data	16-24 months
Nicholson 1977, New Jersey, USA	Economic/material	Food expenditure	Expenditures - Food eaten at home	Study survey data	Unclear
Nicholson 1977, New Jersey, USA	Economic/material	Food expenditure	Expenditures - Food eaten out	Study survey data	Unclear

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Rent	Study survey data	8th Quarter
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Total durables	Study survey data	Quarters 1, 2, 3, 4, 5, and 6
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Clothing	Study survey data	Unclear
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Autos	Study survey data	Unclear
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Home production appliances	Study survey data	Unclear
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Furniture	Study survey data	Unclear
Nicholson 1977, New Jersey, USA	Economic/material	Non-food expenditures	Expenditures - Other appliances	Study survey data	Unclear
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	Home debt	Study survey data	1st and 6th quarters
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	Total nonhome debt	Study survey data	1st and 6th quarters
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	Auto debt	Study survey data	1st and 6th quarters
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	Medical debt	Study survey data	1st and 6th quarters
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	All other debt (non- auto, non-medical)	Study survey data	1st and 6th quarters
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	Financial assets	Study survey data	Unclear

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Nicholson 1977, New Jersey, USA	Economic/material	Personal finances	Cash	Study survey data	Unclear
O'Connor 1979, RIME, USA	Physical health	Nutrition	Quality of dietary intake	24-hour recall method	Quarter 3, quarter 11 (i.e. 2 years apart)
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Cognitive function	Ability to concentrate (self-rated)	Single item (1-5 scale)	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Cognitive function	Memory (self-rated)	Single item (1-5 scale)	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Cognitive function	Learning (self-rated)	Single item (1-5 scale)	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Life satisfaction	General life satisfaction (self- rated)	Single item (0-10 scale)	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, composite score)	Clinical mental distress (MHI-5 score below 53/100)	MHI-5	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Being very nervous over the last 4 weeks	MHI-5 item	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Feeling so low that nothing could make me feel better over the last 4 weeks	MHI-5 item	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Feeling peaceful and calm over the last 4 weeks	MHI-5 item	Unclear

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Feeling sad and downcast over the last 4 weeks	MHI-5 item	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Being happy over the last 4 weeks	MHI-5 item	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Experiencing loneliness	Study survey data	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Experiencing depression	Study survey data	Unclear
Simanainen 2021, Finnish BI Experiment	Mental/psychological health	Mental health (self- reported, single item)	Experiencing an inability to enjoy	Study survey data	Unclear
Simanainen 2021, Finnish BI Experiment	Physical health	Health-related impairments/limitat ions	Having a disease, disability or mental disorder that hinders daily life	Study survey data	Unclear
Simanainen 2021, Finnish BI Experiment	Physical health	Overall physical health (self- reported)	Subjective state of health	Study survey data	Unclear
Thoits 1979, SIME-DIME, USA	Mental/psychological health	Mental health (self- reported, composite score)	Psychological distress score (adapted Macmillan Health Survey)	Adapted Macmillan Health Survey	Males: 4 months, 20 months; females: 8 months, 24 months

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Financial hardship	Falling behind in mortgage repayments or rent	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Financial hardship	Borrowing money from family or friends	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Financial hardship	Falling behind in utilities expenditures	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Financial hardship	Forced to leave current residence	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Food insecurity	Food insecurity	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Food insecurity	Going to bed hungry	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Material deprivation	Severe material deprivation	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Material deprivation	Having roof leaks and moisture problems	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Material deprivation	Material deprivation	Study survey data	Baseline, 11-12 months, 21 months (July 2019)

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Personal finances	Having outstanding debt	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Personal finances	Buffer for unexpected financial expenses	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Education/training	Academic performance	Repeating course (grades 17/18 and 18/19)	Consorci Educació de Barcelona (CEB)	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Education/training	School continuation	Continuing into post mandatory education	Consorci Educació de Barcelona (CEB)	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Education/training	Skills development	Number of persons in the household doing training	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Individual choice and agency	Use of time - recreation and entertainment	Participation in individual leisure	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Mental/psychological health	Life satisfaction	General satisfaction with life (self-rated, 0- 10 scale)	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Mental/psychological health	Life satisfaction	Being very satisfied with their life	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Mental/psychological health	Mental health (self- reported, single item)	Probability of developing a mental disorder (self- reported)	GHQ12	Baseline, 11-12 months, 21 months (July 2019)

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Todeschini 2019, B-Mincome (Barcelona)	Mental/psychological health	Mental health (self- reported, single item)	New diagnostics of anxiety and depression	Health care records	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Mental/psychological health	Subjective financial well-being	Satisfaction with economic situation (0- 10 scale)	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Child health (self- reported)	New obesity diagnostics on people under 15 years	Health care records	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Child health (self- reported)	Number of young people inhousehol reporting bad health	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Overall physical health (self- reported)	Self-rated health being good, very good or excellent	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Physical health (self-reported)	Self-reported serious health problems	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Sleep	Quality of sleep	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Sleep	Sleep deprivation - hours slept during last week	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social engagement	Social participation	Study survey data	Baseline, 11-12 months, 21 months (July 2019)

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social engagement	Volunteering activities	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social engagement	Electoral participation	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social engagement	Participation in social leisure	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social perceptions	Social support and stress - Duke Scale	Duke Scale	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social perceptions	Confidence support	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social perceptions	Emotional support	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Todeschini 2019, B-Mincome (Barcelona)	Social outcomes	Social perceptions	Total perceived support	Study survey data	Baseline, 11-12 months, 21 months (July 2019)
Venti 1984, SIME-DIME, USA	Education/training	School continuation	Probability of Schooling	Study survey data	"three points in time" after start of benefits
West 2021, SEED, USA	Economic/material	Aggregate expenditure	Aggregate spending data	Benefit (debit card) transaction data	Baseline, monthly
West 2021, SEED, USA	Economic/material	Personal finances	Ability to cover a \$400 emergency	Study survey data	Baseline (-3 months), Month 1, Month 6, Month 12

Study	Outcome category	Outcome sub-category	Outcome	Instrument/scale/s ource of data	Timing of assessment
West 2021, SEED, USA	Economic/material	Personal finances	Income volatility - monthly fluctuation	Unclear	Baseline, monthly
West 2021, SEED, USA	Mental/psychological health	Mental health (self- reported, composite score)	Psychological distress score	Kessler 10	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Mental/psychological health	Mental health (self- reported, composite score)	Emotional health (Kessler 10 subscale)	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Mental/psychological health	Mental health (self- reported, composite score)	Emotional well-being (Kessler 10 subscale)	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Physical health	Health-related impairments/limitat ions	Physical functioning	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Physical health	Health-related impairments/limitat ions	Role limitations due to physical health	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Physical health	Health-related impairments/limitat ions	Social functioning (due to health)	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Physical health	Overall health and wellbeing	Overall Health and Wellbeing	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Physical health	Overall physical health (self- reported)	General Health	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12
West 2021, SEED, USA	Physical health	Physical health (self-reported)	Energy over fatigue	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12

Study	Outcome category	Outcome sub- category	Outcome	Instrument/scale/s ource of data	Timing of assessment
West 2021, SEED, USA	Physical health	Physical health (self-reported)	Pain (higher score means less)	Short Form Health Survey 36 (SF-36)	baseline (-3 months), Month 1, Month 6, Month 12

### Appendix 8. Excluded poverty-related outcomes and non-relevant outcomes

Study	Category	Outcome
Calnitsky 2019, Mincome (Canada)	Other	Reason for not working – laid off
Elesh 1977, New Jersey, USA	Physical health	Number of work days lost (husband and wife)
Elesh 1977, New Jersey, USA	Physical health	Total physician visits (husband and wife)
Elesh 1977, New Jersey, USA	Physical health	private physician visits (husband and wife)
Elesh 1977, New Jersey, USA	Physical health	other physician visits (husband and wife)
Elesh 1977, New Jersey, USA	Physical health	Total physician visits (children)
Elesh 1977, New Jersey, USA	Physical health	private physician visits (children)
Elesh 1977, New Jersey, USA	Physical health	other physician visits (children)
Forget 2011, Mincome (Canada)	Other	Proportion of Women with at Least One Child by Age 25
Forget 2011, Mincome (Canada)	Other	Mean Number of Children before Age 25 by Mother's Birth Cohort
Forget 2011, Mincome (Canada)	Other	Family dissolution
Forget 2011, Mincome (Canada)	Physical health	Physician visits
Gonalons-Pons 2021, Mincome (Canada)	Other	Couple Splits (separation/"exit")
Gonalons-Pons 2021, Mincome (Canada)	Other	Divorce talk frequency (separation/"exit")
Gonalons-Pons 2021, Mincome (Canada)	Other	Wives' temporary break-ups (separation/"exit")
Kaluzny 1979, Gary, USA	Other	Probability of moving
Kerachsky 1977, New Jersey, USA	Physical health	Number of Physician Visits - Adult Males
Kerachsky 1977, New Jersey, USA	Physical health	Number of Clinic Visits - Adult Males
Kerachsky 1977, New Jersey, USA	Physical health	Visit to Specialist - Adult Males

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Kerachsky 1977, New Jersey, USA	Physical health	Number of Dentist Visits - Adult Males
Kerachsky 1977, New Jersey, USA	Physical health	Number of Days in Bed - Adult Males
Kerachsky 1977, New Jersey, USA	Physical health	Number of Days Not Working - Adult Males Only
Kerachsky 1977, New Jersey, USA	Physical health	Number of Physician Visits - Adult Females
Kerachsky 1977, New Jersey, USA	Physical health	Number of Clinic Visits - Adult Females
Kerachsky 1977, New Jersey, USA	Physical health	Visit to Specialist - Adult Females
Kerachsky 1977, New Jersey, USA	Physical health	Number of Dentist Visits - Adult Females
Kerachsky 1977, New Jersey, USA	Physical health	Number of Days in Bed - Adult Females
Ladinsky 1977, New Jersey, USA	Other	Mass media exposure – tv
Ladinsky 1977, New Jersey, USA	Other	Mass media exposure – newspaper and magazine reading
Mallar 1977, New Jersey, USA	Economic/material	Labor-Supply Activity of Youths (Predicted Marginal Effects in Middle Two Years)
Mallar 1977, New Jersey, USA	Economic/material	Labor Force Participation of Youths (Predicted Marginal Effects Evaluated at Appropriate Probabilities)
McDonald 1979, Gary, USA	Economic/material	Labor-force participation by youths
Middleton 1977, New Jersey, USA	Mental/psychological health	Support government social programs
Muffels 2021, Dutch (Netherlands)	Economic/material	Employment outcomes (fulltime, partime, temporary)
Muffels 2021, Dutch (Netherlands)	Other	Self-efficacy in finding work
Muffels 2021, Dutch (Netherlands)	Other	Job search efforts
Muffels 2021, Dutch (Netherlands)	Other	Trust in case worker
Simanainen 2021, Finnish BI Experiment	Physical health	Use of health services: Public Health Nurse
Simanainen 2021, Finnish BI Experiment	Physical health	Use of health services: Hospital physician

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Simanainen 2021, Finnish BI Experiment	Physical health	Use of health services: Dentist
Simanainen 2021, Finnish BI Experiment	Physical health	Use of health services: Other health care services
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Labor participation (using survey data)
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Using social services
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Number of people working in the household
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Having an indefinite full-time job
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Engaging in entrepreneurship
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Receiving housing subsidy
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Receiving discretionary transfer from municipal social services
Todeschini 2019, B-Mincome (Barcelona)	Economic/material	Receiving the RGC
Todeschini 2019, B-Mincome (Barcelona)	Other	Use of time - household common tasks
Todeschini 2019, B-Mincome (Barcelona)	Physical health	Prescription of painkillers
Venti 1984, SIME-DIME, USA	Economic/material	Probability of Working
Venti 1984, SIME-DIME, USA	Education/training	Joint probability of neither attending school nor working
West 2021, SEED, USA	Economic/material	Aggregate spending data
West 2021, SEED, USA	Economic/material	Employment

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