

Food Assistance During and After the Great Recession in Metropolitan Detroit

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Abstract

Economic shocks produced by the Great Recession have contributed to rising food insecurity, with 14.7 percent of U.S. households being food insecure in 2009, compared to 11.1 percent in 2007. At the same time, SNAP caseloads increased by nearly 60 percent since 2007 and the program now reaches more than 40 million persons. Using data from the first two waves of the Michigan Recession and Recovery Survey (MRRS), a unique panel survey of a representative sample of working-age adults in the Detroit Metropolitan Area, this project explores three research questions related to the receipt of SNAP among low-income households: How have low-income families in the Detroit Metropolitan Area bundled SNAP with other types of public assistance and help from charitable nonprofits in the wake of the Great Recession? When controlling for economic shocks and respondent characteristics, to what extent is access to local food assistance resources related to receipt of SNAP and charitable nonprofit food assistance? How are receipt of SNAP assistance and economic shocks related to household food shopping behaviors and food security? Several important findings emerge from this project that should be of interest to scholars, policymakers, and advocates. Among them is the finding that food insecurity is quite prevalent among poor and near-poor households in metro Detroit following the Great Recession. Fifty-one percent of households below the federal poverty line were food insecure in the year prior to the Wave 1 survey.

Keywords: Food insecurity; Great Recession; SNAP; Michigan Recession and Recovery Survey

Executive Summary

BACKGROUND AND METHODOLOGY

Economic shocks produced by the Great Recession have contributed to rising food insecurity, with 14.7 percent of U.S. households being food insecure in 2009, compared to 11.1 percent in 2007. At the same time, SNAP caseloads increased by nearly 60 percent since 2007 and the program now reaches more than 40 million persons. Nonprofit food pantry use also increased during the Great Recession, with an estimated 37 million persons using charitable food programs in 2009. Financial hardship has increased as well in recent years due to the economic downturn, placing greater importance on understanding the connections between food assistance, food security, and other types of material need.

Using data from the first two waves of the Michigan Recession and Recovery Survey (MRRS), a unique panel survey of a representative sample of working-age adults in the Detroit Metropolitan Area, this project explores three research questions related to the receipt of SNAP among low-income households: How have low-income families in the Detroit Metropolitan Area bundled SNAP with other types of public assistance and help from charitable nonprofits in the wake of the Great Recession? When controlling for economic shocks and respondent characteristics, to what extent is access to local food assistance resources related to receipt of SNAP and charitable nonprofit food assistance? How are receipt of SNAP assistance and economic shocks related to household food shopping behaviors and food security?

Data for this project comes from the first two waves of the Michigan Recession and Recovery Survey (MRRS), which gathers detailed information about employment history, income sources, food security, safety net program participation, private social support, material hardships, health and mental health, grocery shopping habits, and basic household demographics from a representative sample of households with adults aged 19 to 64 years living in the three-county Detroit metropolitan Area. Wave 1 of the MRRS completed hour-long in-person interviews between late October 2009 and March 2010 with 914 adults between the ages of 19 and 64 (response rate of 82.8 percent). The second wave (also hour-

long in-person interviews) was completed between April and August 2011 with 847 respondents (response rate of 93.9 percent). Information about the residential location of each MRRS respondent is used to assess household proximity and accessibility to a number of different food assistance and retail resources: SNAP administrative offices; food pantries; SNAP authorized retailers; and food retailers as reported by InfoUSA marketing data. In doing so, this study is in a unique position to connect household-level food outcomes (i.e., program participation, food security, grocery shopping habits) to the local food resource infrastructure with a precision not found in most published food policy research.

FINDINGS

Several important findings emerge from this project that should be of interest to scholars, policymakers, and advocates. First, food insecurity is quite prevalent among poor and near-poor households in metro Detroit following the Great Recession. Fifty-one percent of households below the federal poverty line were food insecure in the year prior to the Wave 1 survey. Consistent with recent research findings that food insecurity is more prevalent among non-poor populations than is commonly realized, 36.3 percent of households with income between 100 to 200 percent of the federal poverty line and 33.4 percent of households with income between 200 to 300 percent of federal poverty were classified as food insecure in the twelve months prior to Wave 1. Perhaps reflecting effects of the economic recovery, the prevalence of food insecurity declined slightly between waves of the MRRS. Nevertheless, more than 40 percent of poor households and about one-third of near-poor households were food insecure in Wave 2.

Nearly 70 percent of Wave 1 households with income below the poverty line report receiving SNAP benefits at some point in the prior year, compared to 27.9 percent of households with income between 100 and 200 percent of federal poverty. Receipt of charitable food assistance is less common among poor and near-poor households in Detroit than is receipt of SNAP. About one-third of poor households report receiving charitable food assistance and less than 15 percent of households between 100 percent and 200 percent of poverty report receiving help from nonprofit charities. As might be

expected, we find that households experiencing periods of unemployment and detachment from the labor force due to work limiting health conditions are more likely to receive public and private food assistance than households that do not experience spells of unemployment or detachment from the labor force.

This study also finds evidence that low-income households receiving SNAP reside closer on average to both SNAP administrative offices and food pantries than low-income households that do not receive SNAP. There also is some evidence that poor households receiving SNAP are located slightly closer to SNAP retailers and chain grocery stores than poor households not receiving SNAP. In contrast to expectations from some of the existing literature on food deserts, however, we find that poor households in Detroit on average are slightly closer to the nearest SNAP retailer, SNAP grocery store, or chain grocery store. Differences in spatial access to food assistance program resources (e.g., SNAP offices or food pantries) is found to be associated with increased likelihood that a household receives assistance, even after controlling for relevant demographic and economic factors. For example, being within 1 mile of a SNAP administrative office increases the likelihood of receiving SNAP assistance by about one-third over the baseline case where the household is more than a mile away from a SNAP office.

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INTRODUCTION¹

While the Great Recession officially ended in June 2009, rates of food insecurity and receipt of food assistance persist above their pre-recession levels. From 2008 to 2011, over 14 percent of households were food insecure at some time during the year, compared to about 11 percent of households from 1999 to 2007 (Coleman-Jensen, Nord, Andrews, and Carlson, 2012). SNAP participation rates and use of emergency food assistance programs similarly increased in the last five years. Between December 2007 and October 2010 the SNAP caseload increased by nearly 60 percent and reached more than 40 million persons during a typical month in 2010 (Center on Budget and Policy Priorities, 2010; Eslami, Filion, and Strayer, 2011). Nonprofit food pantry use increased during the Great Recession and an estimated 37 million individuals received help from charitable food programs in 2009, including a large percentage of SNAP recipients (Mathematica Policy Research, 2010; U.S. Conference of Mayors, 2008). Financial hardship has increased as well in recent years due to the economic downturn, placing greater importance on understanding the connections between food assistance, food security, and other types of material need (Nord and Golla, 2009; Pan and Jensen, 2008; Shaefer and Gutierrez, 2012; Yen, Andrews, Chen, and Eastwood, 2008).

At the same time, there has been a surge in interest around the impact of spatial context on the presence, prevalence, and persistence of food insecurity. Much of the research to date has been focused on the presence of “food deserts,” where limited spatial access to grocery stores or outlets of affordable and fresh food is thought to be associated with lower household food security for adults and children.

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Other aspects of place matter as well. For instance, some evidence suggests that the presence of nonprofit food assistance programs also can vary widely by neighborhood and across communities, ironically being less accessible to low-income populations most in need (Allard, 2009b).

Combined, these trends place greater importance on understanding the connections between food assistance, food resource access, and food security (Nord and Golla 2009; Pan and Jensen 2008; Shaefer and Gutierrez 2012; Yen, Andrews, Chen, and Eastwood 2008). Identifying where low-income households found help during the downturn and subsequent recovery will highlight which population subgroups today's safety net is most likely to reach and which subgroups may be better served. Inquiry into the use of public and private assistance may be especially important in the current context, as the Great Recession was the most severe test of the contemporary safety net's capacity to respond to persistent need. Improved understanding of the spatial antecedents of food assistance and food insecurity also could translate into more efficient allocation of public program dollars, private capital, entrepreneurial activity, and philanthropic resources.

Using data from the first two waves of the Michigan Recession and Recovery Survey (MRRS), a unique panel survey of a representative sample of working-age adults in the Detroit Metropolitan Area, this IRP RIDGE Center for National Food and Nutrition Assistance Research grants program-supported project explores several research questions related to the receipt of SNAP among low-income households: How have low-income families in the Detroit Metropolitan Area bundled SNAP with other types of public assistance and help from charitable nonprofits in the wake of the Great Recession? When controlling for economic shocks and respondent characteristics, to what extent is spatial access to local food assistance resources related to receipt of SNAP and charitable nonprofit food assistance? How are receipt of SNAP assistance and economic shocks related to household food shopping behaviors and food security?

Our findings to date provide insight into how low-income families combine governmental and nongovernmental food assistance with other safety net programs to weather the effects of job loss and economic recession. Such insights could prove useful for program outreach and efforts to enroll

households eligible for different types of public assistance. Our results further highlight how the spatial distribution of food assistance resources may affect program take-up and indirectly shape food behaviors among low-income households. Although nested within the Detroit metropolitan area, we think these findings will help planning and coordination efforts in a variety of urban and suburban locations.

UNDERSTANDING RECEIPT OF FOOD ASSISTANCE IN THE CONTEXT OF THE GREAT RECESSION

The Great Recession had a dramatic and sustained impact on work, earnings, and poverty in most communities in the United States. Decreases in work activity and median household income following the end of the Great Recession were far more severe than any other recession since 1970. Increases in poverty following the Great Recession were much higher than any other recession since 1980. The poverty rate increased by two percentage points during the recession from 2007 to 2009, and then continued to increase by almost a full percentage point in 2010 to peak at 15.1 percent nationally. During that three-year span, nearly 10 million Americans fell below the federal poverty line (DeNavas-Walt, Proctor, and Smith, 2011; DeNavas-Walt, Proctor, and Smith, 2012). Also in contrast to past recessions, the impact of the Great Recession was felt in suburban, as well as urban and rural, communities.²

Consistent with the severity of the economic downturn, participation rates for most public assistance programs increased directly in response to the Great Recession. According to a recent Census Bureau report, 17.8 percent of the U.S. population—roughly 42 million persons—received assistance from Temporary Assistance for Needy Families (TANF); General Assistance; Supplemental Nutrition Assistance Program (SNAP, formerly food stamps); Supplemental Security Income (SSI); Medicaid; or housing assistance in 2005. In 2009, about 45 million people (18.6 percent of the population) received assistance from these public programs, an increase of about 6 percent (Kim, Irving, and Loveless, 2012). Combined, public cash and in-kind safety net programs such as TANF, SNAP, the Earned Income Tax

²In fact, the initial effects of the recession were more severe in suburban areas than in the urban centers of the largest metropolitan areas in the United States, see Garr (2011).

Credit (EITC), Medicaid, and Unemployment Insurance (UI) help delivered more than \$300 billion in benefits to tens of millions of low-income households in 2009 (Center on Budget and Policy Priorities, 2012; Isaacs, Vericker, Macomber, and Kent, 2009; Kneebone, 2009; Simms, 2008; U.S. Department of Health and Human Services, 2010).

Even though the recession officially ended in 2009, the effects of the downturn persisted for many low-income households whose work opportunities and earnings have not returned to pre-recession levels. Many safety net programs continued to expand, therefore, in the several years following the end of the recession. Between December 2007 and April 2012, the SNAP caseload increased by about 70 percent to serve more than 46 million persons, with the steepest growth in the program occurring between 2009 and 2011 (Center on Budget and Policy Priorities, 2012; Eslami, Filion, and Strayer, 2011). Medicaid expenditures and enrollment have increased steadily since 2007 with the program serving 10 million more individuals in 2011 than four years before (Kaiser Commission of Medicaid and the Uninsured, 2012; Smith, Gifford, Ellis, Rudowitz, and Snyder, 2012). SSI caseloads continued to steadily increase following the Great Recession, with the total caseload rising from about 7 million in 2007 to about 8 million individuals in 2012 (Congressional Budget Office, 2007, 2012; Schmidt, 2012). Similarly, per capita expenditures for the EITC continued to increase in the few years following the recession (Moffitt, 2012).

As suggested by the discussion above, SNAP is one of the largest public assistance programs in place today and is the largest public food assistance program in operation. SNAP provides monthly food assistance benefits to households with gross monthly income at or below 130 percent of the federal poverty level. Food stamps caseloads fell in the 1990s due to historic economic growth and welfare reform, but SNAP caseloads have risen past pre-welfare reform levels since 2000. Particularly sharp increases in SNAP participation occurred in the years during and after the Great Recession. Nationally, SNAP caseloads increased by 69 percent from 2007 to 2012 and the program reached nearly 45 million individuals in 2012 (Klerman and Danielson, 2012; U.S. Department of Agriculture, 2012a). The average

SNAP recipient received about \$133 a month in benefits in 2012 and SNAP program expenditures in that year reached about \$81 billion (Center on Budget and Policy Priorities, 2013).

Complementing SNAP and other public food assistance programs are private nonprofit charities and social service organizations that provide food and meals to low-income families in need. Nonprofit food pantry use has increased since the Great Recession and an estimated 37 million individuals received help from charitable food programs in 2009, including a large percentage of SNAP recipients (Feeding America, 2011; Mathematica Policy Research, 2010). About one-third of food pantry clients received help from a program at least once every month in a calendar year (Feeding America, 2011). Food pantry use is more prevalent in cities and rural places, and in the South—areas where poverty rates tend to be higher and families are at greater risk of not having enough food (Nord, Andrews, and Carlson, 2008).

SNAP assistance and other types of food assistance are expected to reduce hunger and improve household food security. Food assistance, however, simultaneously seeks to improve food security and allow households greater flexibility to reallocate income to other pressing needs or bills. In-kind assistance programs like SNAP are intended to reduce household financial hardship by increasing household purchasing power. Increasingly food assistance may serve as a gateway to other types of public and private assistance. Although not a stated goal in many instances, therefore, receipt of food assistance also may build awareness or connection to other programs of assistance for which low-income households may be eligible.

Factors Associated with Receipt of Food Assistance

The existing research literature points to many factors that may shape how households draw upon public or private sources of support and whether they bundle many different types of assistance over the course of a year. Household economic circumstances are critical determinants of program participation. Income poverty, job loss, decreased work earnings, and periods of unemployment or detachment from the labor force lead to financial and material hardships. Families in poverty are more likely to seek public and private assistance to address such hardships than households above the poverty line who also may be

experiencing such hardships.³ Households below and just above the federal poverty line are eligible for many types of public assistance, but income eligibility varies by program. For example, SNAP reaches households with income at or below 130 percent of the federal poverty line, but Medicaid can reach uninsured adults and children above 150 percent of poverty. Private charities similarly consider poverty status or income when delivering programs of support, although income eligibility rules often are more flexible than those in public programs (Johnson, 2012; Kim, Irving, and Lovelace, 2012).

Several demographic factors are thought to matter as well. Female-headed households, who are more likely to be poor and qualify for public programs than married couples or single male-headed households, are much more likely to participate in means-tested public programs (Kim, Irving, and Lovelace, 2012). Individuals without a high school or college degree may be more likely to receive public assistance because of the difficulty finding a good paying job.⁴ Older women who head households and those in good health have been found less likely to receive welfare cash assistance, food stamps, or public housing assistance than younger women or those with poor health conditions (Keane and Moffitt, 1998; Ratcliffe, McKernan, and Finegold, 2008). Participation rates in public programs are much higher among blacks and Hispanics than whites.⁵ Race and ethnic differences in program participation may reflect lower income and higher incidence of poverty among race and ethnic minorities. Legal restrictions on immigrant access to public assistance programs, as well as gaps in cultural competency, and race or ethnic discrimination lead to lower take-up of government cash and in-kind benefit programs.⁶ In addition, there

³Nearly three-quarters of persons with income below the federal poverty line received some type of public assistance in 2009, see Kim, Irving, and Lovelace (2012).

⁴Participation in means-tested public programs has been found to be twice as high among individuals without a high school degree, as among those with a high school degree (33.1 percent versus 17.8 percent respectively), see Kim, Irving, and Loveless (2012). Keane and Moffitt (1998) similarly find higher levels of education related to lower rates of welfare, food stamp, and housing assistance receipt.

⁵Kim, Irving, and Loveless (2012) find that 46.3 percent of blacks and 44.1 percent of Hispanics received assistance from a means-tested public program at some time in 2009, compared to 16.9 percent of whites.

⁶For instance, children from low-income immigrant households are roughly half as likely to access SNAP (or food stamp) benefits or TANF assistance as children from low-income native-born households, see Chaudry and

is evidence that predominantly black and Hispanic neighborhoods have less access to government and nonprofit social service offices than predominately white neighborhoods (Allard, 2008; Allard and Roth, 2014).

A number of policy-related factors also shape program participation. Due to shared administrative processes and categorical eligibility determinations, participation in certain public assistance programs is highly correlated with participation in other public programs. For example, the vast majority of low-income families receiving TANF, SSI, or SNAP benefits also are enrolled in Medicaid because those programs often are coordinated in the same government offices or application procedures (Ratcliffe, McKernan, and Finegold, 2008; Reese, 2006). As a result, more than 96 percent of TANF clients and 88 percent of SNAP clients in 2004 were receiving supports from at least two other public assistance programs. On the other hand, programs like Unemployment Insurance often are administered through government offices that do not provide other means-tested public programs. Thus, receipt of UI is only weakly correlated with other means-tested programs (Reese, 2006). State-level variation in eligibility and recertification policies can lead to state-level differences in program utilization. There is evidence that states with more lenient food stamp eligibility rules or longer recertification periods see higher rates of program participation than states with more restrictive eligibility or recertification policies (Ratcliffe, McKernan, and Finegold, 2008). Additionally, there are complex interactions between benefit levels and eligibility determinations that can dampen participation. Even though TANF and food stamp receipt are highly correlated, stronger TANF sanction policies and TANF limitations on immigrant eligibility lower rates of food stamp receipt among otherwise eligible individuals (Ratcliffe, McKernan, and Finegold, 2008; Fix, Capps, and Kaushal, 2009; Borjas, 2004).

Household characteristics of SNAP recipients provide insight into factors that may be associated with food assistance program take-up. Roughly eight in ten households receiving SNAP have income

Fortuny (2010), Fix, Capps, and Kaushal (2009), Ratcliffe, McKernan, and Finegold (2008), and Soss, Fording, and Schram (2011).

below the federal poverty line. Families in extreme poverty—those in great need or risk—are more likely to participate in the program.⁷ Households experiencing unemployment and those in areas with higher unemployment rates are more likely to participate in the program.⁸ Controlling for other household characteristics, studies find that blacks are more likely to receive SNAP than whites. Low levels of completed education are found to be associated with higher likelihood of SNAP receipt. About half of all households receiving SNAP contain children and slightly more than half of SNAP households with children are single-parent households. Disability and health limitations also increase the likelihood that a household receives SNAP (U.S. Department of Agriculture, 2009b; Hanratty, 2006; Klerman and Danielson, 2011; Purtell, Gershoff, and Aber, 2012; U.S. Department of Agriculture, 2012a). Roughly three of every four SNAP recipients are children, elderly adults, or individuals with a disability (Congressional Budget Office, 2012).

Similar factors have been found to shape use of food pantries or other charitable emergency food assistance programs. Racial minorities, single-parent households, individuals and households with low levels of income, individuals in poor health, and low educational attainment have been found more likely to receive food pantry assistance (Bartfeld, 2003; Bhattarai, Duffy, and Raymond, 2005; Feeding America, 2011; Martin, Cook, Rogers, and Joseph, 2003). Many who use food pantries may lack access to SNAP. For example, Algert, Reibel, and Renvall (2006) find that about 80 percent of food pantry clients in two cities in Southern California received no SNAP benefits, despite having very low levels of income. Low take-up of SNAP among these food pantry clients is associated with housing instability, immigrant status, and lack of English language skills.

⁷Bartlett, Burstein, and Hamilton (2004) find that eligible families are less likely to believe they were eligible to participate in SNAP if they have income above the federal poverty line, had some assets (e.g., car or bank account), and were not experiencing food insecurity.

⁸A majority of SNAP households with a non-disabled working age adult are working while receiving benefits, but many recipients who are working are under-employed or have unstable attachment to the labor force (McKernan and Ratcliffe, 2003; Rosenbaum, 2013; U.S. Department of Agriculture, 2012b). Nevertheless, the percentage of recipients with work earnings has increased substantially over the past fifteen years (McKernan and Ratcliffe, 2003). Of working-age recipients that aren't working, only about 40 percent were found to be not in the labor force, often because of a disability or caring for an adult or child with a disability (Rosenbaum, 2013).

Apart from understanding which factors are associated with food assistance program participation, it is important to assess how receipt of food assistance affects household food security and other aspects of hardship due to recession, unemployment, or income poverty. Selection effects, however, make it difficult to produce unbiased estimates of the association between food assistance receipt and household food security because of unmeasured or unobserved characteristics likely correlated with both food assistance receipt and household hardship (Daponte, Sanders, and Taylor, 1999; Gibson-Davis and Foster, 2006; Gundersen and Oliveira, 2001; Nord and Golla, 2009). Many studies address selection by using state-level food assistance policy variation to instrument for food assistance receipt. When using instrumental variable approaches, these studies often find food assistance receipt to be associated with lower risk of household food insecurity (Bartfeld and Dunifon, 2006; Shaefer and Gutierrez, 2012; Yen, Andrews, Chen, and Eastwood, 2008).

Access to Food Assistance Resources and Food Retailers

Apart from standard household and individual characteristics commonly understood to shape food assistance program participation, there is growing interest in degree to which spatial context affects food assistance program participation rates and food security. Even though public assistance programs are funded and regulated by the federal and state government, program application and administration often occurs in local offices. While state-level program eligibility policies can affect the size of food assistance program caseloads, such policies may be implemented less consistently or evenly between and within local places (Bartlett, Burstein, and Hamilton, 2004; Klerman and Danielson, 2011; Soss, Fording, and Schram, 2011). Moreover, nonprofit social service providers have discretion over what programs to offer, which client populations to serve, and where to locate operations. Many factors constrain where public and private nonprofit food assistance program offices are located, but chief among them can be considerations about public transit accessibility, the cost of suitable office space, and the location of key partners or funders (Allard, 2009b). Not all neighborhoods or communities will have easy access to public

or nonprofit providers, and the presence of such supports varies widely from place to place (Allard, 2009b; Allard and Roth, 2010).

Indeed, there is evidence that food assistance programs may not be as well-matched to the location of need as might be imagined. Allard (2009b) finds high-poverty neighborhoods in metropolitan Chicago, Los Angeles, and Washington, D.C., to have about 50 percent less access to emergency food and cash assistance providers than low-poverty neighborhoods. Kissane (2010) underscores that spatial access to community-based social service organizations, many of which offer emergency food assistance, is critical to understanding which programs low-income households utilize. Interviews with low-income women from the Kensington neighborhood in Philadelphia yielded evidence that even distances up to a mile were too far for low-income households to manage. Interviews also underscore that perceived safety and race or ethnic composition of the community, along with other aspects of social context, powerfully shape which local organizations individuals feel comfortable to visit. In more suburban or rural areas, the distances that clients and providers must travel to receive or deliver food assistance are higher and place greater burdens on individuals or organizations. On top of these considerations, research has found rural and suburban communities to have fewer, less well-resourced, and less accessible food assistance providers than urban communities (Allard, 2009a; Allard and Roth, 2010).

There is evidence that greater proximity to safety net program providers will increase the likelihood that low-income households will know about programs of assistance, receive referrals, and be able to commute to those opportunities, which should translate into higher take-up of assistance (Allard, 2009b; Allard, Tolman, and Rosen, 2003; Bartlett, Burstein, and Hamilton, 2004; Kissane, 2003). For example, SNAP clients may be expected to make re-certification visits and submit application materials in-person (McKernan and Ratcliffe, 2003). Challenges finding child care and accessing administrative offices during the workday are associated with lower SNAP take-up among eligible families (Widom and Martinez, 2007). Distance from SNAP offices may increase time or commuting costs and thus discourage participation (Bartlett, Burstein, and Hamilton, 2004; U.S. Department of Agriculture, 2010). Lack of access to a car, lack of information about local programs, and difficulty carrying food home were the

most prominently cited reasons that low-income households in Hartford, CT, did not participate in local food pantry assistance programs (Martin, Cook, Rogers, and Joseph, 2003).

Along with interest in the spatial dimension of food assistance resources, there has been a significant rise in research examining the prevalence and location of “food deserts,” neighborhoods and areas containing no or very few grocery stores or stores carrying fresh food items. The retail food environment may be causally connected to food security because it shapes what households can purchase and the extent to which the costs of food shopping are higher for residents of disadvantaged communities. Closer proximity to food retailers, particularly those accepting SNAP benefits, may be related to food assistance take-up as well. Not only may proximity to supermarkets or food stores accepting SNAP benefits reduce time and transportation costs for food assistance recipients, but the presence of such stores may also increase awareness of the program and its benefits. Access to supermarkets and chain stores may be particularly important to food outcomes among food assistance recipients, as these types of stores have been found to carry a wider array of fresh food items and to offer lower food prices than other types of food retailers (U.S. Department of Agriculture, 2009a).

While the median U.S. household is 0.81 miles to the nearest supermarket and the average time spent on travel to grocery shopping is about 15 minutes per day (U.S. Department of Agriculture, 2009a), many studies find access to food retailers has been found to vary by race, ethnicity, and class composition of a community. Studies often report that predominantly black and Hispanic neighborhoods have less access to supermarkets and large chain grocery stores than predominately white areas. For example, Gallagher (2006) finds that residents of majority African-American neighborhoods in Chicago have to travel almost 40 percent farther on average to reach the nearest chain grocery store compared to residents of majority white neighborhoods (0.77 miles versus 0.57 miles on average). Nationally, zip codes with “higher proportions” of African-Americans have been found to contain half as many chain grocery stores on average as zip codes with higher proportions of whites (Powell, Slater, Mirtcheva, Bao, and Chaloupka, 2007). Lower income areas also have been found to contain fewer chain grocery stores than middle or upper income areas (Powell et al., 2007; Moore and Diez Roux, 2006). A study of three

communities located in Maryland, New York, and North Carolina finds that “predominantly white” and affluent census tracts contain twice as many supermarkets on average than predominantly black and poorer areas when controlling for population size (Moore and Diez Roux, 2006). Similarly, Zenk and colleagues (2005) find that high-poverty predominantly African-American census tracts in Detroit are about 1.1 miles farther from the nearest chain supermarket compared to high-poverty predominantly white tracts in Detroit.

Whether looking at spatial access to food assistance programs or food retailers, however, very few studies can link the residential location of low-income individuals, food assistance recipients, or food insecure households to the location of food resources with any real precision (Allard, 2014). Most studies use census tracts or zip codes as the unit of analysis and focus on whether a program or store location falls within those geographic boundaries, providing only blunt measures of access that risk misstating the scope of gaps in food resource access. Most of the empirical work examining the relationship between place, food assistance, and food security, therefore, emerges from studies that lack the conceptual and empirical clarity required to assess local-level spatial processes.

RESEARCH QUESTIONS AND DATA

We propose to extend this literature in two ways. First, we propose to use the spatial variation in the administration and availability of food assistance resources in Detroit to create a unique set of instruments for modeling how SNAP program participation affects household outcomes in the Michigan Recession and Recovery Survey (MRRS). Second, in addition to looking at food security and financial hardship, we argue that studies of food assistance should look at changes in specific food consumption or shopping behavior that would directly affect quality of diet or food security. A growing literature on food deserts examines the presence of grocery stores and supermarkets in high poverty areas (Gallagher, 2006; Haider and Bitler, 2009; Neckerman, Bader, Purciel, and Yousefzadeh, 2009; Sparks, Bania, and Leete, 2011), yet very little work has explored how food assistance is related to changes in where low-income households shop.

Using data from the first two waves of the Michigan Recession and Recovery Survey (MRRS), a unique panel survey of a representative sample of working-age adults in the Detroit Metropolitan Area, this IRP RIDGE Center for National Food and Nutrition Assistance Research Grants Program-supported project explores several research questions related to the receipt of SNAP among low-income households: How have low-income families in the Detroit Metropolitan Area bundled SNAP with other types of public assistance and help from charitable nonprofits in the wake of the Great Recession? When controlling for economic shocks and respondent characteristics, to what extent is spatial access to local food assistance resources related to receipt of SNAP and charitable nonprofit food assistance? How are receipt of SNAP assistance and economic shocks related to household food shopping behaviors and food security?

To answer these questions, we use unique panel data from the Detroit Metropolitan Area during 2008 and 2010 to examine food security, food assistance, and coping responses to hardship among households with income at or below 300 percent of the federal poverty line. Our data come from the first two waves of the MRRS, which gathers detailed information about employment history, income sources, education and training, safety net program participation, private social support, material hardships, health and mental health, marital and relationship status, and basic household demographics from a representative sample of households with adults aged 19 to 64 years living in the three-county Detroit metropolitan area. Wave 1 of the MRRS completed hour-long in-person interviews between late October 2009 and March 2010 with 914 adults between the ages of 19 and 64 (response rate of 82.8 percent). The second wave (also hour-long in-person interviews) was completed between April and August 2011 with 847 respondents (response rate of 93.9 percent).⁹ Demographic characteristics of MRRS respondents at or below 300 percent of poverty can be found in Table 3 below.

⁹When survey weights are applied, the MRRS sums to the American Community Survey (ACS) estimated total population count for Macomb, Oakland, and Wayne counties of metropolitan Detroit; see Adams, Lepkowski, Elkasabi, and Battle (2011).

At each wave of the MRRS, respondents were asked a series of questions about food purchases and consumption in the 12 months prior to the survey. Wave 1 contained only five of six items from the USDA six-item food security scale collected each December in the Current Population Survey (CPS); Wave 2 contained all six items from the December CPS module. Responses were used to assess household food insecurity. Specifically, respondents were asked if “often/sometimes” in the last 12 months:

1. The food they bought just didn’t last, and they didn’t have money to get more.
2. They couldn’t afford to buy balanced meals.
3. They or other adults in household cut the size of their meals or skipped meals because there wasn’t enough money for food.
4. If yes to question 3, whether this happened almost every month, some months but not every month, or in only 1 or 2 months.
5. They ate less than they felt they should because there wasn’t enough money to buy food.
6. They were hungry but didn’t eat because they couldn’t afford enough food.

We sum the number of responses indicating “often” or “sometimes” to this battery of questions to create a scale score reflecting household food insecurity. Households with scores of 0 or 1 are defined as having high or marginal food security, households with scores of 2 to 4 indicate low food security, and scores of 5 in Wave 1 or 5 to 6 in Wave 2 are defined as having very low food security. We define food insecure households as those with either low or very low food security (summed scores ranging from 2 to 5 or 6, depending on wave). Households with summed scores of 0 or 1 are defined as food secure. We classify respondents as experiencing persistent food insecurity if they report low or very low food security in both waves of the MRRS. Ideally we would have the full six-item instrument in both waves, but comparison of the five-item instrument to the full six items in Wave 2 indicates that the two instruments provide nearly identical estimates of food insecurity (see Table 1). Unless specified, we use the five-item measure in analyses reported below.

The MRRS collects self-reported information on receipt of benefits or assistance through SNAP, TANF, Social Security Disability Insurance (SSDI), SSI, public health insurance such as Medicaid, UI,

Table 1: Food Security among Households at or below 300% of the Federal Poverty Line (FPL)

| Household Income and Composition in Wave 1 | Percentage of Households with Income . . . | | |
|--|--|-------------------|-------------------|
| | <= 100% of FPL | 100–200% of FPL | 200–300% of FPL |
| Wave 1 Food Insecurity | | | |
| 0–1 Items | 49.2 ^{ab} | 63.7 ^a | 66.6 ^b |
| 2–4 Items | 30.6 ^a | 20.4 ^a | 24.8 |
| 5 Items | 20.3 ^b | 15.8 | 8.6 ^b |
| Percent Food Insecure – 5-Item Measure | 50.8 ^{ab} | 36.3 ^a | 33.4 ^b |
| Wave 2 Food Insecurity | | | |
| 0–1 Items | 56.3 ^{ab} | 70.1 ^a | 72.0 ^b |
| 2–4 Items | 29.3 | 23.5 | 22.9 |
| 5 Items (Replicating Wave 1) | 14.4 ^{ab} | 6.4 ^a | 5.2 ^b |
| 5–6 Items | 19.0 ^{ab} | 9.0 ^a | 7.7 ^b |
| Percent Food Insecure – 5-Item Measure | 43.7 ^{ab} | 29.9 ^a | 28.0 ^b |
| Percent Food Insecure – 6-Item Measure | 43.7 ^{ab} | 30.3 ^a | 28.0 ^b |
| Food Insecure – Wave 1 Only | 17.7 | 16.6 | 12.6 |
| Food Insecure – Wave 2 Only | 10.6 | 10.2 | 7.2 |
| Food Insecure Both Waves (5-Item Measure) | 33.2 ^a | 19.7 ^a | 20.8 |

Notes: ^{a,b,c} – Cross-row cell-pair comparisons are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the federal poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession and Recovery Study (MRRS).

EITC, and public housing assistance. Also, the MRRS captures receipt of food or shelter assistance from a private nonprofit charity in the prior year. Eligibility for SNAP is means-tested and assistance is available only to households with income within 130 percent of the federal poverty line. Private charities have greater discretion over eligibility, but often will target help to those with low-income. Accordingly, we focus our analyses below on receipt of public safety net benefits and receipt of private support only for respondents in households who reported annual income below 300 percent of the federal poverty line. As household income rises above the poverty line, households are less likely to be eligible for public safety net assistance programs, such as SNAP. Households with annual income near the poverty line, however, may experience periods or spells during a year where income falls to the point where they may be income eligible. Due to the effects of recession, these households coping with lower work earnings also may seek help from nonprofit charities with less rigid income eligibility guidelines than public cash or in-kind assistance programs.

Apart from income, race, age, presence of children, and marital status, our analyses focus on several key household characteristics hypothesized to shape receipt of public and private supports. To capture educational attainment, we categorize respondents by whether they have less than a high school degree or equivalent, a high school degree or equivalent but no bachelor's degree, or a completed bachelor's degree. Respondents indicated whether they were working or unemployed for each month of the 12 months prior to the survey. We categorize respondents according to whether they were employed in each of the previous 12 months, unemployed 1 to 6 months out of the previous 12, unemployed 7 or more months, or whether they were out of the labor force for all twelve months prior to the interview. For those out of the labor force in all 12 months, we distinguish between those with a physical health limitation preventing them from working and those without such limitations.¹⁰ Finally, we use measures of frequent church attendance, regular access to a car, and current or past union membership to reflect

¹⁰The MRRS includes a health limitation measure used in the Panel Study of Income Dynamics that reflects whether respondents “have any health problem or disability which prevents you from working or which limits the kind or amount of work you can do?”

community connectedness, and access to professional associations that may provide short-term help during spells of unemployment.

We combine our survey data with local level data about the location of SNAP administrative offices, food pantries, SNAP retailers, and food retailers that are used to create measures of food assistance resource access. In doing so, we are in a unique position to connect household-level food outcomes (program participation, food security, grocery shopping habits) to the local food resource infrastructure with a precision not found in most published food policy research. Information about the residential location of each MRRS respondent is used to locate households in a geographic information system and street-grid, then to assess proximity and accessibility of different food assistance and retail resources. Because few studies are able to make such textured spatial connections between households and food resources, we examine several different measures of food resource access—each with its own advantages and limitations. First, we examine distance to the nearest SNAP office, food pantry, SNAP retailer, SNAP grocery store (as reported by the USDA), and grocery store or supermarket (as reported by InfoUSA marketing data). While nearest-distance measures reflect immediate proximity, not all households may shop or receive help at the closest store or provider. Distance to resources may operate as a threshold effect, than linear decay process where greater distance steadily decreases probability of using or visiting a particular resource. Thus, we create several distance bands to indicate whether a household was located within 1, 2, or 3 miles of a given type of resource. Using data from the American Community Survey (ACS), we examine the density of SNAP households within a mile of each respondent's household. We believe this local-level measure of food assistance may reflect levels of information about food assistance and the degree of stigma associated with receiving assistance. Finally, nearest-distance measures do not capture whether there are multiple resources nearby. The broader project, therefore, considers the accessibility of food resources within different commuting times by different modes of transportation. Here, we only examine the number of grocery stores or supermarkets (using InfoUSA

data) that fall within a 10-minute drive of each household.¹¹ More specific information about the MRRS, data sources used to calculate access, and the approach to calculating access can be found in the Technical Appendix.

It is important to recognize that these survey data reflect a very unique urban setting. Whereas the national unemployment rate hovered at 9 percent in August 2011, the unemployment rate for the Detroit metropolitan area remained at nearly 12 percent—several percentage points above its pre-recession level. And, at 36.2 percent in 2011, Detroit’s poverty rate was more than double the national average of 15 percent in 2011 (Bureau of Labor Statistics, 2013; DeNavas-Walt, Proctor, and Smith, 2012). The city remains one of the most racially segregated urban centers in the country. Well-documented population loss has left entire neighborhoods abandoned and led to a dramatic hollowing out of entire portions of the central city. Compounding matters, the city of Detroit has experienced substantial fiscal problems over the past several decades, culminating with its recent bankruptcy. Such fiscal problems make access to certain types of locally financed public and private sources of support less predictable.

Alternatively, because the Detroit area has experienced difficult economic conditions longer than most other metro areas, we might expect the lessons from Detroit may portend what can be expected in other cities as their labor markets slowly recover. These data also will allow future work to use geographic information about the location of respondents to accurately control for spatial access to a number of different employment, safety net, and community resources when looking at household outcomes.

Examining receipt of public and private sources of support in a single metropolitan area is advantageous for several other reasons. Most importantly, by focusing on a single metro area in a single state we are able to hold constant factors such as public program eligibility standards, benefit generosity, and the strength of the local philanthropic community that vary from place to place. The SNAP program in Michigan is called the “Food Assistance Program,” or FAP.

¹¹Roughly 90 percent of households in the MRRS report using a car when shopping for groceries.

eligibility is based on household composition, income, and an asset test added in 2011.¹² Household income must be less than 130 percent of the federal poverty line after a 20 percent earned income disregard and deductions are calculated.¹³ The income limit is 200 percent of the federal poverty line if the recipient is a senior or receives Social Security disability or Veteran's Administration disability. A household in which one member receives TANF assistance or State Disability Assistance (SDA) is automatically eligible to receive FAP (Michigan Legal Help, 2013; State of Michigan, 2010). FAP beneficiaries must recertify their benefits every 3, 12, or 24 months. Recertification requirements are specific to each client, but generally require reporting of current income, assets, and expenses and provision of verifying documents. Even though Detroit's local labor market conditions may differ from those of other areas, we believe the manner in which low-income households draw upon federal safety net programs and patterns of use related to job loss and lost earnings should be generalizable to other settings.

To this point, the Detroit metropolitan region experienced increases in SNAP caseloads commensurate with trends in other major urban areas and nationally. In 2000, there were 241,018 SNAP recipients in Wayne County, compared to 30,139 in Oakland County and 19,090 in Macomb County. SNAP receipt increased by 80 percent in Wayne County by 2009 (434,323 recipients), but increased by 213 percent in Oakland County (94,244 recipients) and by 402 percent in Macomb County (95,821 recipients). SNAP caseloads continued to increase through 2011, totaling more than 814,000 recipients in the three-county metro area and nearly tripling between 2000 and 2011, according to USDA county-level administrative data (U.S. Department of Agriculture, 2013a).¹⁴

¹² In 2011, Michigan added asset tests to the eligibility criteria for FAP, which limited savings to \$5,000 and value of a car to \$15,000.

¹³ Income includes most kinds of earned and unearned income, such as wages, self-employment earnings, rental income, Social Security benefits, veterans' benefits, and child support received. Apart from the standard deduction based on group size, household income calculations take into account shelter and dependent care deductions; see State of Michigan (2013b).

¹⁴ In 2008, the average monthly FAP benefit per household was \$212.38 and increased to \$268.60 in 2010; see U.S. Department of Agriculture (2013a).

There is reason to expect that most MRRS respondents eligible for SNAP would have applied in person and followed up on applications in person at one of 23 offices listed at the State of Michigan DHS website in 2011. In recent years the State of Michigan has pursued SNAP modernization efforts that include the creation of call centers, implementation of online eligibility screening, and completion of applications online.¹⁵ Although Michigan has modernized its SNAP application process in order to maximize outreach to potential SNAP households while minimizing administrative costs, these modernization initiatives were not in place when the Waves 1 and 2 of the MRRS were in the field. For example, in 2009 Michigan opened test call centers, but these only allowed current SNAP clients to report changes (U.S. Department of Agriculture, 2010). In Michigan, online applications did not appear until mid-2010.¹⁶ Finally, in 2010 the Michigan DHS began partnering with community organizations to test self-service sign-up kiosks. Information kiosks and trained staff were placed in nonprofit social service and food pantry locations, but the program did not become fully functional until 2011.¹⁷ Finally, SNAP policy in Michigan still required applicants to appear for face-to-face interviews until 2011. Thus, current and potential SNAP participants in 2008 and 2010 would still have been dependent on local SNAP offices.

¹⁵Modernization efforts were in response to studies that showed that nonparticipating but eligible SNAP households cited the difficulty of getting to a food stamp office as a barrier to participation; see Bartlett and Burstein (2004).

¹⁶ Schwabish (2012) notes that although SNAP participation rates are higher in states with online applications, the impact of online applications on participation does not manifest itself immediately. Rather, participation grows minimally in the first three years after online applications are introduced, and accelerates thereafter.

¹⁷Michigan more intentionally engaged community-based organizations in outreach as part of its modernization, but a study by the USDA uncovered that applications submitted through community organizations constitute a “small minority of applications”; see U.S. Department of Agriculture (2013b).

EMPIRICAL RESULTS—RATES OF FOOD SECURITY AND PROGRAM PARTICIPATION IN METRO DETROIT

Food insecurity is quite prevalent among poor and near-poor households in metro Detroit following the Great Recession.¹⁸ Nearly 51 percent of households below the federal poverty line were food insecure in the year prior to the Wave 1 survey (50.8 percent, see Table 1). Twenty percent of poor households—almost half of all poor households qualifying as food insecure—responded in the affirmative to all five items, an indication of severe levels of food insecurity in the prior year. Consistent with expectations that food insecurity is more common among nonpoor populations than is commonly realized, 36.3 percent of households with income between 100 and 200 percent of the federal poverty line and 33.4 percent of households with income between 200 and 300 percent of federal poverty were classified as food insecure in the 12 months prior to Wave 1. Again, while these figures do not represent food insecurity in all weeks or months of the preceding year, these high rates of food insecurity reflect the economic and financial hardships that a wide range of poor and near-poor households grapple with in metropolitan Detroit.

Possibly a reflection of the impact of economic recovery, the prevalence of food insecurity declined slightly between waves of the MRRS across all income groups. The percentage of poor households qualifying as food insecure (using the five-item measure) declined by about 14 percent between waves (50.8 percent of households to 43.7 percent). Comparably sized declines in rates of food insecurity occurred among near-poor households between the two waves. Across both waves of the MRRS, however, food insecurity remained much more prevalent among poor households than near-poor households.

¹⁸Overall, 23 percent of all MRRS respondents were food insecure at Wave 1 (Danziger, Allard, Wathen, Burgard, Seefeldt, Rodems, and Cohen, 2014). MRRS food insecurity estimates are comparable to estimates of population-level food insecurity generated by Gunderson, Waxman, Engelhard, Satoh, and Chawla (2013) in the three counties that compose the Detroit area in 2009: 23.8 percent for Wayne County; 15.3 percent for Oakland County; and, 17.7 percent for Macomb County.

Finally, although a majority of food insecure households were food insecure in each wave of the survey, we find some evidence of churning in and out of food insecurity in Detroit following the Great Recession. For example, roughly one-third of those households reporting food insecurity in Wave 1 were food secure in Wave 2. Similarly, about one-quarter of poor households that were food insecure in Wave 2, were food secure in Wave 1. One-third of poor households, however, were persistently food insecure across the two waves of the survey, as were about 20 percent of households with income between 100 and 300 percent of poverty (see column 3). While the experience of food insecurity may be temporary for some families, there is a sizeable percentage of poor and near-poor households who experience food insecurity persistently over time.

As should be expected given income eligibility standards, receipt of SNAP and charitable food assistance was more common among poor households than near-poor households in metro Detroit. In large part this reflects income eligibility thresholds for SNAP (130 percent of federal poverty or 200 percent for seniors or those receiving Social Security disability or Veteran's Administration disability). Roughly 70 percent of poor households received SNAP in a given wave and more than 6 in 10 poor households received SNAP in both waves (see top panel of Table 2, columns 1 through 3). Rates of receipt are even higher among poor households with minor children, which is to be expected given that the federal poverty line is determined by income and household size. About 85 percent of poor households with children under 18 years of age reported receiving SNAP in the previous year.

Even households just above the poverty line or income eligibility thresholds may experience a shock to household income at some point in the year that qualifies them to receive SNAP benefits. Indeed, the second panel in Table 2 shows that 28.1 percent of households with income between 100 and 200 percent of federal poverty in Wave 1 reported receiving SNAP. As income moves above 200 percent of poverty, receipt of SNAP is much less common with only 6.4 percent of households reporting such assistance in Wave 1.

In contrast to the prevalence of food insecurity, we observe that the share of households receiving SNAP increased slightly between waves—although the difference in SNAP receipt between waves does

Table 2: Food Assistance Receipt among Households at or below 300% of the Federal Poverty Line (FPL)

| Household Income and Composition in Wave 1 | Percentage of Households | | | | | |
|---|--------------------------|-------------------------|--------------------------|---|-------------------------|--------------------------|
| | Receiving SNAP | | | Receiving Assistance from Charitable Nonprofits | | |
| | Wave 1 Only (1) | Wave 2 Only (2) | Both Waves (3) | Wave 1 Only (4) | Wave 2 Only (5) | Both Waves (6) |
| <= 100% of FPL | 6.1 | 8.8^a | 61.7^{ab} | 12.5^a | 11.8^a | 21.1^{ab} |
| Households with Children under 18 | 3.3 | 6.1 | 81.4 ^d | 18.7 ^b | 16.3 | 21.2 |
| Households with no Children under 18 | 8.2 | 10.9 | 46.3 ^d | 7.6 ^b | 8.2 | 21.0 |
| 100-200% of FPL | 9.6 | 15.3^a | 18.5^{ac} | 7.9 | 8.4 | 5.7^{ac} |
| Households with Children under 18 | 14.2 | 14.5 | 14.3 | 6.5 | 12.5 | 6.6 |
| Households with no Children under 18 | 5.5 | 16.0 | 22.3 | 9.1 | 4.8 | 4.8 |
| 200-300% of FPL | 3.6 | 12.4 | 2.8^{bc} | 6.4^a | 4.6^a | 1.2^{bc} |
| Households with Children under 18 | 0.0 | 16.5 | 4.7 | 3.9 | 3.6 | 0.9 |
| Households with no Children under 18 | 5.9 | 9.7 | 1.6 | 8.0 | 5.3 | 1.5 |

Notes: ^{a,b,c} – Within column cell-pair comparisons of FPL are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the federal poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession and Recovery Study (MRRS).

not quite reach conventional levels of statistical significance. Nevertheless, these findings indicate that receipt of SNAP food assistance in Detroit at least held steady almost two years after the recession officially ended. Persistent receipt of food assistance is more common among households with income below the federal poverty line. About 90 percent of poor households receiving SNAP in Wave 1 reported SNAP benefits in both waves. We believe this reflects the low likelihood that poor households in Detroit were able to find work or enough work to lift them above SNAP eligibility thresholds for an extended period of time in the wake of the recession. As we also might expect, there is evidence that SNAP receipt is more transitory among higher-income households. More frequent SNAP entry and exits likely reflect short-term use by households that temporarily meet the income threshold in the course of the year.

Receipt of charitable food assistance is less common than SNAP assistance among poor and near-poor households in Detroit. One-third of poor households report receiving charitable food assistance in either wave of the MRRS (see top panel of Table 2, columns 4 through 6), compared to nearly 70 percent of poor households who reported receiving SNAP in the previous year. Less than 15 percent of households between 100 and 200 percent of poverty report receiving help from nonprofit charities in Waves 1 or 2; less than 10 percent of households between 200 and 300 percent of poverty report help from nonprofit charities in any given wave. Receipt of charitable food assistance also is less persistent across the two waves of the MRRS compared to SNAP assistance. Approximately 2 of 3 poor households reporting charitable food assistance received such assistance in both waves. Such findings fit with evidence that nonprofit food pantries or soup kitchens often are a resource of last resort for households experiencing persistent deep need or hardship (Feeding America, 2011).

Despite differences in prevalence and persistence, we find that the SNAP and charitable food assistance caseloads in metropolitan Detroit share many similarities. Table 3 reports the demographic characteristics of those on SNAP and receiving charitable food assistance. For instance, almost two-thirds of SNAP recipients and recipients of nonprofit charity have income below the federal poverty line. Reflecting the racial composition of Detroit and the disproportionately high rates of poverty among blacks in Detroit, roughly 70 percent of SNAP and charity assistance recipients are black. More than three-

Table 3: Characteristics of MRRS Households at or below 300% of the Federal Poverty Level (FPL)

| Household or Respondent Characteristic | All HHs <= 300% FPL | SNAP Recipients | Charity Recipients |
|--|------------------------|--------------------|-----------------------|
| Income at or below 100% of the FPL | 35.1 | 61.9 | 63.3 |
| Income 100% to 200% of the FPL | 33.1 | 30.4 | 23.1 |
| Income 200% to 300% of the FPL | 31.8 | 7.7 | 13.6 |
| Food Insecure | 37.6 | 48.3 | 64.6 |
| Food Secure | 62.4 | 51.7 | 35.4 |
| SNAP Recipients | 38.1 | — | 67.8 |
| No SNAP | 61.9 | — | 32.2 |
| Charity Recipients | 17.7 | 31.8 | — |
| No Charity | 82.3 | 68.2 | — |
| Black | 43.7 | 68.5 | 73.5 |
| Nonblack | 56.3 | 31.5 | 26.5 |
| HH with children | 45.3 | 54.2 | 48.1 |
| HH without children | 54.7 | 45.8 | 51.9 |
| Age 19–24 | 15.3 | 18.5 | 10.3 |
| Age 25–34 | 21.9 | 23.4 | 21.0 |
| Age 35–44 | 19.0 | 18.6 | 19.7 |
| Age 45+ | 43.8 | 39.5 | 49.0 |
| Married | 29.4 | 16.6 | 23.6 |
| Not married | 70.6 | 83.4 | 76.4 |
| Less than HS | 18.8 | 30.6 | 26.6 |
| HS but no BA | 65.7 | 63.6 | 67.5 |
| BA or more | 15.5 | 5.7 | 5.8 |
| No unemployment | 40.5 | 23.4 | 23.7 |
| 1–6 mos. unemployed | 16.3 | 16.2 | 21.9 |
| 7–12 mos. unemployed | 29.9 | 41.3 | 32.2 |
| NILF all 12 months w/o health limitation | 3.8 | 3.1 | 2.2 |
| NILF all 12 months w/health limitation | 9.5 | 15.9 | 20.0 |
| Frequent Religious Attendance | 41.1 | 40.4 | 41.5 |
| Owns or Leases a Car | 69.3 | 55.8 | 54.4 |
| Was or is a Union Member | 26.4 | 30.1 | 31.3 |

Note: Data are pooled across Waves 1 and 2 of the survey. Column percentages are reported. Household survey weights applied. Unweighted $N = 969$.

Source: Michigan Recession & Recovery Study (MRRS).

quarters of assistance recipients are not married and more than 90 percent have a high school degree or less.

Other interesting features of food assistance caseloads stand out in Table 3. First, 64.6 percent of households receiving help from nonprofit charities also are food insecure, compared to 48.3 percent of SNAP recipients. Again, this finding reflects the heightened financial distress associated with receipt of food assistance from emergency service providers. Almost one-quarter of food assistance recipients—both those reporting SNAP benefits or help from charitable nonprofits—reported no months of unemployment in the prior year. Slightly more than half of SNAP recipients and households receiving help from nonprofit charities experienced unemployment for more than 6 of the previous 12 months or were out of the labor force altogether for the entire previous year. Finally, about 55 percent of food assistance recipients have regular access to an automobile. Although not shown in Table 3, poor households are much less likely to have regular access to a car than households with income above the poverty line. Combined, these findings reflect the limited mobility of a large share of the food assistance population in metropolitan Detroit, particularly those most in need or most at-risk of experiencing food insecurity.

Food assistance programs may be important gateways to other types of safety net assistance. Apart from categorical eligibility provisions in Michigan that automatically qualify those on TANF or disability assistance for food stamps, the process of applying for SNAP may lead low-income households to learn of other public programs for which they are eligible. Similarly, many food pantries or emergency assistance providers offer clients information about public assistance programs and help with application for public benefits (Allard, 2014). One possible pathway through which food assistance may reduce food insecurity or economic hardship, therefore, may be through increasing take-up of other sources of support. To begin to consider whether such pathways exist, Table 4 reports rates of program participation for SNAP recipients and recipients of charitable food assistance across six types of public assistance: TANF, SSI, public health insurance, EITC, UI, and public housing.

Table 4: Bundling of Food Assistance among Households at or below 300% of the Federal Poverty Line (FPL)

| Given that a household receives and has income: | Percentage of Households that then Receive . . . | | | | | | | | | |
|---|--|---------|------|------|-------------------------|------|------|----------------|--------------------------------|----------------------------|
| | SNAP | Charity | TANF | SSI | Public Health Insurance | EITC | UI | Public Housing | Mean Number of Public Programs | Public Program and Charity |
| SNAP | | | | | | | | | | |
| <100% of FPL | — | 36.9 | 30.0 | 41.1 | 67.2 | 55.1 | 9.2 | 30.3 | 2.9 | 36.9 |
| 100–200% of FPL | — | 25.6 | 12.9 | 29.7 | 50.9 | 53.7 | 21.3 | 14.6 | 2.5 | 25.6 |
| 200–300% of FPL | — | 15.1 | 26.5 | 19.7 | 19.5 | 35.8 | 25.6 | 13.4 | 2.2 | 15.1 |
| Charity | | | | | | | | | | |
| <100% of FPL | 73.3 | — | 25.9 | 34.3 | 65.3 | 62.8 | 17.9 | 25.6 | 2.6 | 93.4 |
| 100–200% of FPL | 68.4 | — | 8.1 | 34.3 | 50.2 | 41.4 | 14.5 | 9.7 | 2.0 | 83.4 |
| 200–300% of FPL | 20.7 | — | 10.0 | 22.0 | 20.0 | 20.4 | 27.0 | 0.0 | 1.1 | 68.4 |

Note: Data are pooled across Waves 1 and 2 with household weights applied for SNAP and individual weights for Charity. Unweighted $N = 969$.

Source: Michigan Recession & Recovery Study (MRRS).

Although Table 4 reports simultaneous program participation, there is evidence that SNAP recipients, poor and near-poor, draw upon additional public program resources. The average poor household receiving SNAP also participates in almost two other public assistance programs. Even nonpoor SNAP recipients receive help from slightly more than one other public program on average. Sources of public support reflect components of the safety net that have become increasingly important to working poor and near-poor families in the last decade. For example, nearly 70 percent of poor households receiving SNAP also receive public health insurance coverage (67.2 percent) and slightly more than half receive the EITC (55.1 percent). Thirty percent of SNAP recipients with income below the poverty line also report receiving TANF at some point in the previous year. This is due to restrictive TANF eligibility determinations and work requirements that lead many SNAP-eligible individuals to be ineligible for TANF or to not apply altogether.

SNAP recipients with annual income within 200 percent of federal poverty also are likely to draw upon public health insurance programs (50.9 percent) and the EITC (53.7 percent). About one in five SNAP recipients with income between 100 and 200 percent of poverty also report household receipt of UI in the previous year (21.3 percent), more than twice the rate observed among poor households receiving SNAP. Table 4 also highlights how nonpoor households receiving SNAP draw upon other sources of public assistance at some point during the year to cope with job loss or lost work earnings. Slightly more than one-third of SNAP households with income between 200 and 300 percent of poverty report receiving the EITC, one-quarter report receiving UI, and nearly 20 percent participated in a public health insurance program.

Highlighting the important overlap of public and private sources of support within poor and near-poor households, the average household reporting assistance from a charitable nonprofit participated in more than two public assistance programs in the prior year. Roughly 70 percent of households at or below 200 percent of federal poverty reporting charitable food assistance also report SNAP benefits. These figures reflect the depth of need among low-income households and gaps that public programs do not cover. For example, SNAP clients may turn to charitable food pantries throughout the year to help stretch

food budgets or to provide meals after SNAP benefits for the month have been exhausted (Feeding America, 2011). Two-thirds of poor households receiving help from nonprofit charities receive coverage from public health insurance programs or assistance through the EITC.

Of significance for policy research concerned with spatial access to food assistance resources or food retailers, Table 4 also underscores the extent to which food assistance populations are connected to programs of disability assistance. More than 40 percent of poor households receiving SNAP also report SSI benefits, as do nearly one-third of poor households receiving help from charitable nonprofits. In Michigan, eligibility for SNAP is automatic for those receiving SSI when the recipient is an individual or every member of his SNAP group is also receiving SSI. If some members of the group do not receive SSI, categorical eligibility is forfeited, but SNAP eligibility is enhanced by a 200 percent federal poverty level income limit, rather than the standard 130 percent limit (State of Michigan, 2013a).

Access to Food Resources

As we have shown, many food assistance households have limited access to transportation resources. Such realities underscore the importance of living near food assistance programs and food retailers. Tables 5 and 6 report mean food resource access score values across a number of different measures by household income group, food security status, SNAP receipt, and receipt of charitable assistance.

We find that poor households in Detroit live closer on average to SNAP administrative offices and food pantries than households with income between 100 and 300 percent of poverty. For example, households with income below the poverty line are about three-quarters of a mile closer to a SNAP administrative office on average than households with income between 100 and 200 percent of poverty (2.48 miles versus 3.22 miles, see column 1). Mean differences in the average distance to food pantries follow a similar pattern, although the magnitude of the differences is much smaller. Poor households are located about one mile from the closest food pantry on average, compared to 1.29 miles for households just above the federal poverty line (see rows 1 and 2, column 2). Similarly, column 6 shows that poor

households live within one mile of about 500 more households receiving SNAP on average than households with income between 100 and 200 percent of poverty (see column 6, 1,565 SNAP households versus 1,011 SNAP households).

In contrast to expectations from the food desert literature, however, we find that poor households on average are slightly closer to the nearest SNAP retailer, SNAP grocery store, or chain grocery store. Poor households in metropolitan Detroit live about one-half mile from the closest SNAP-authorized grocery store and about four-tenths of a mile from the closest chain supermarket or large grocery store on average (see columns 4 and 5). By comparison, households with income between 200 and 300 percent of poverty are located 0.8 miles from the nearest SNAP-authorized grocery store and 0.61 miles from the closest supermarket or large grocery store on average (see columns 4 and 5). While statistically significant, these differences in distance to the nearest grocery store amount to about two to three city blocks.

The middle panel of Table 5 compares mean food resource access levels between poor households that are food secure or insecure, as well as between poor households receiving or not receiving food assistance. The bottom panel of Table 5 makes similar comparisons for households between 100 and 200 percent of poverty. Several interesting findings emerge when we compare food secure to insecure households or food assistance recipients to nonrecipients within the same income strata. First, whether looking at poor households or near-poor households, food secure and food insecure households do not differ significantly in most dimensions of food resource access. In fact, where mean differences reach or approach conventional levels of statistical significance, we find that food secure households are slightly farther from food assistance program resources and food retailers on average than food insecure households. Such findings run counter to expectations that emerge from the food desert literature, although the mean differences in access are quite small in size and may not reflect a meaningful substantive difference.

We do find evidence that low-income households receiving SNAP are closer on average to both SNAP administrative offices and food pantries. For example, SNAP recipients with income below the

Table 5: Food Resource Access among Households at or below 300% of the Federal Poverty Line (FPL) by Food Security and Food Assistance in Wave 1 of the MRRS

| Wave 1 Household Characteristics | Measure of Food Resource Access in Wave 1 | | | | | | |
|----------------------------------|---|--------------------|----------------------|---------------------|----------------------|-------------------------------|--|
| | Average Distance in Miles to Nearest ... | | | | | Average Number of ... | |
| | SNAP Office (1) | Food Pantry (2) | SNAP Retailer (3) | SNAP Grocery (4) | Grocery Store (5) | SNAP HHs within 1 mile (6) | Grocery Stores within 10-minute drive (7) |
| Income <= 100% of FPL | 2.48 ^{ab} | 0.99 ^{ab} | 0.28 ^{ab} | 0.52 ^a | 0.41 ^a | 1,565 ^{ab} | 1.23 ^{ab} |
| Income 100–200% of FPL | 3.22 ^a | 1.29 ^a | 0.35 ^{ac} | 0.60 ^b | 0.52 | 1,011 ^{ac} | 0.90 ^{ac} |
| Income 200–300% of FPL | 3.57 ^b | 1.45 ^b | 0.44 ^{bc} | 0.80 ^{ab} | 0.61 ^a | 744 ^{bc} | 0.63 ^{bc} |
| Income <= 100% of FPL | | | | | | | |
| Food Insecure | 2.29 | 1.06 | 0.27 | 0.53 | 0.40 | 1,582 | 1.34 |
| Food Secure | 2.67 | 0.92 | 0.28 | 0.51 | 0.41 | 1,548 | 1.13 |
| SNAP Recipients | 2.23 ^a | 0.86 ^a | 0.25 ^a | 0.48 ^a | 0.36 ^a | 1,714 ^a | 1.31 |
| No SNAP | 3.05 ^a | 1.29 ^a | 0.34 ^a | 0.61 ^a | 0.50 ^a | 1,199 ^a | 1.04 |
| Charity Recipients | 2.10 ^a | 0.77 ^a | 0.24 | 0.46 | 0.34 ^a | 1,859 ^a | 1.40 ^a |
| No Charity | 2.67 ^a | 1.10 ^a | 0.30 | 0.55 | 0.44 ^a | 1,414 ^a | 1.15 ^a |
| Income 100–200% of FPL | | | | | | | |
| Food Insecure | 2.91 | 1.18 | 0.28 ^a | 0.47 ^a | 0.54 | 1,218 ^a | 0.99 |
| Food Secure | 3.40 | 1.36 | 0.39 ^a | 0.68 ^a | 0.50 | 889 ^a | 0.85 |
| SNAP Recipients | 2.55 ^a | 1.08 | 0.24 ^a | 0.45 ^a | 0.49 | 1,480 ^a | 1.29 ^a |
| No SNAP | 3.49 ^a | 1.37 | 0.40 ^a | 0.66 ^a | 0.53 | 821 ^a | 0.75 ^a |
| Charity Recipients | 2.64 | 1.10 | 0.28 | 0.51 | 0.53 | 1,469 ^a | 1.21 |
| No Charity | 3.31 | 1.32 | 0.36 | 0.62 | 0.52 | 937 ^a | 0.86 |

Notes: ^{a,b,c,d,e,f} – Cell-pair comparisons are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the federal poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession & Recovery Study (MRRS).

poverty line live almost one mile closer to a SNAP administrative office on average than poor households not receiving SNAP (2.23 miles versus 3.05 miles, see column 1). Poor households receiving SNAP also live about four-tenths of a mile closer to the nearest food pantry than poor households not receiving SNAP (0.86 miles versus 1.29 miles, see column 2). Similarly, poor households receiving help from nonprofit charities are located about one-half mile closer to SNAP administrative offices and about one-third of a mile closer to the nearest food pantry than poor households not receiving help from such charities.

Although the size of the mean differences is often quite small, we find evidence that poor households receiving SNAP are located slightly closer to SNAP retailers and chain grocery stores than poor households not receiving SNAP. As shown in column 4 of Table 5, poor households receiving SNAP are 0.13 miles closer to a SNAP-authorized grocery store than a poor household not receiving SNAP.

It may be that there are threshold distances or levels of access to food resources that matter more than the nearest distance. For example, it may be more important to be located within a mile or two of a food retailer or food assistance office, than to be within half a mile of a retailer or program of assistance. Understanding the share of low-income households or households at-risk for food security located within a few miles of food retailers or assistance programs may be more telling about disparities and gaps in food resource access. Table 6 reports the share of households within certain distances of a SNAP administrative office, grocery stores, and food pantries.

The top panel in Table 6 examines the share of households within certain distance bands of food resources by income level. Consistent with Table 5, we find that poor households are disproportionately likely to live within relatively short distances of SNAP offices and food pantries than nonpoor households. For example, nearly half of all households in Detroit with income below the federal poverty line are within 2 miles of a SNAP administrative office, compared to less than one-third of households with income between 100 and 300 percent of federal poverty (column 2). While access may be greater among poor households according to these measures, a large percentage of poor households remain more

Table 6: Food Resource Access among Households at or below 300% of the Federal Poverty Line (FPL) by Food Security and Food Assistance in Wave 1 of the MRRS

| Wave 1 Household Characteristics | Percentage of Households in Wave 1 | | | | | | | |
|----------------------------------|------------------------------------|--------------------|--------------------|--------------------------|-------------------|---------------------------------|--------------------|--------------------|
| | Distance to Nearest SNAP Office | | | Within 1 Mile of a . . . | | Distance to Nearest Food Pantry | | |
| | Within 1 Mile (1) | Within 2 Miles (2) | Within 3 Miles (3) | SNAP Grocery (4) | Grocery Store (5) | Within 1 Mile (6) | Within 2 Miles (7) | Within 3 Miles (8) |
| Income <= 100% of FPL | 14.4 ^a | 45.2 ^a | 68.8 ^{ab} | 87.8 ^a | 93.6 | 63.1 ^{ab} | 85.8 | 94.6 |
| Income 100–200% of FPL | 10.1 ^b | 29.1 ^a | 48.4 ^a | 86.9 ^b | 85.9 | 39.4 ^a | 82.1 | 93.2 |
| Income 200–300% of FPL | 3.5 ^{ab} | 26.9 | 45.7 ^b | 75.0 ^{ab} | 85.9 | 40.3 ^b | 73.2 | 95.0 |
| Income <= 100% of FPL | | | | | | | | |
| Food Insecure | 21.5 ^a | 54.9 ^a | 69.2 | 84.1 | 90.8 | 63.1 | 79.2 | 93.7 |
| Food Secure | 7.0 ^a | 35.1 ^a | 68.3 | 91.6 | 96.4 | 63.0 | 92.7 | 95.6 |
| SNAP Recipients | 16.5 | 49.0 | 76.8 ^a | 91.7 ^a | 97.2 | 70.3 ^a | 90.1 | 94.5 |
| No SNAP | 9.3 | 36.8 | 50.6 ^a | 78.5 ^a | 85.3 | 46.5 ^a | 75.6 | 94.7 |
| Charity Recipients | 20.6 | 56.5 ^a | 78.4 ^a | 90.2 | 95.8 | 69.4 | 91.7 | 100.0 ^a |
| No Charity | 11.2 | 39.5 ^a | 63.9 ^a | 86.6 | 92.4 | 59.9 | 82.9 | 91.9 ^a |
| Income 100–200% of FPL | | | | | | | | |
| Food Insecure | 15.2 ^a | 35.9 | 49.3 | 92.5 | 81.3 | 47.9 | 81.0 | 92.5 |
| Food Secure | 7.3 ^a | 25.2 | 47.9 | 83.7 | 88.5 | 34.6 | 82.7 | 93.6 |
| SNAP Recipients | 16.9 ^a | 46.9 ^a | 62.4 ^a | 92.3 | 87.9 | 61.8 ^a | 79.9 | 94.1 |
| No SNAP | 7.5 ^a | 22.1 ^a | 42.9 ^a | 84.8 | 85.1 | 30.7 ^a | 82.9 | 92.9 |
| Charity Recipients | 24.6 ^a | 45.2 | 56.2 | 91.5 | 81.3 | 58.4 | 74.7 | 100.0 |
| No Charity | 7.9 ^a | 26.6 | 47.2 | 86.2 | 86.6 | 36.4 | 83.2 | 92.2 |

Notes: ^{a,b,c,d,e,f} – Cell-pair comparisons are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the federal poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession & Recovery Study (MRRS)

than 3 miles from a SNAP office. Almost two-thirds of poor households are within one mile of a nonprofit food pantry, compared to about 40 percent of households with income between 100 and 300 percent of federal poverty (column 6). When we expand the distance threshold a little farther, however, we find that nearly every household with income at or below 300 percent of poverty is within 3 miles of a food pantry in Detroit. At least when considering distances to nearest office locations, we find charitable food assistance to be more accessible than SNAP offices.

SNAP benefits are placed on an electronic benefit transfer card (EBT) and used at food retailers. It may be more important for SNAP recipients to be close to retailers and grocery stores that accept SNAP EBT. Poor households appear to be slightly more likely to be located within one mile of a grocery or supermarket that accepts SNAP than households between 200 and 300 percent of federal poverty (column 4). We also find that more than 8 in 10 households at or below 300 percent of poverty are within one mile of grocery stores listed in the InfoUSA directory (column 5).

We observe similar patterns when examining the share of food insecure households or households receiving food assistance that fall within a few miles of these same food resources. Food insecure households with income below poverty are more likely to be within one or 2 miles of SNAP administrative offices, compared to food secure households. Similarly, the bottom panel of Table 6 shows that SNAP recipients and recipients of charitable food assistance are more likely to be within 3 miles of SNAP administrative offices (column 3) and within one mile of nonprofit food pantries than nonrecipient households in the same income bracket (column 6). SNAP recipients with household income below the poverty line are slightly more likely to be within one mile of a grocery store accepting SNAP than poor nonrecipients (91.7 percent versus 78.5 percent, respectively, column 4).

Tables 7 and 8 examine an identical set of food resource access measures, but across poor and near-poor households according to whether they live in an urban or suburban location, have access to a car, live in a tract where the poverty rate exceeds 20 percent, or live in a tract that is majority black. Of significance, we find poor and near-poor suburban residents of metropolitan Detroit have far less access to food assistance resources than comparably poor or near-poor residents of central city neighborhoods.

For example, poor households in the city of Detroit are 1.63 miles from a SNAP office and 0.57 miles from a food pantry on average, compared to 3.39 miles to a SNAP office and 1.45 miles to a food pantry for poor persons in suburban Detroit (see top panel of Table 7, columns 1 and 2). The top panel of Table 8 confirms these findings, indicating that less than half of poor respondents in suburban locations are within 3 miles of a SNAP office, compared to over 90 percent of poor respondents in the central city (44.1 percent versus 91.7 percent, respectively). Similarly, 90.3 percent of poor respondents in the central city are within one mile of a food pantry, compared to 33.8 percent of poor respondents in the suburbs.

There is some evidence that poor and near-poor persons in suburban areas have less access to food retailers than similar households in the central city, suggesting that food deserts may be more problematic outside of cities than inside of cities. For example, poor persons in suburban areas are about a quarter of a mile farther from a SNAP retailer on average than poor persons in the city of Detroit (0.40 miles versus 0.17 miles, respectively) and have access to about one-third as many grocery stores within a 10-minute drive (0.53 stores versus 1.88 stores, respectively).

Consistent with these findings, but in contrast to some of the research examining access to food retailers, we find that residents in high-poverty and predominately black neighborhoods have both greater access to food assistance resources and to food retailers. Poor and nonpoor residents of high-poverty neighborhoods or predominately black neighborhoods are about twice as close to SNAP offices and food pantries as residents of low-poverty or predominately non-black neighborhoods. Table 7 also shows that poor and near-poor residents of high-poverty neighborhoods or predominately black neighborhoods are slightly closer to SNAP retailers and have access to more grocery stores within a 10-minute drive than residents of low-poverty or predominately non-black neighborhoods.

These initial examinations of food resource access provide some interesting observations about the accessibility of food resources in the context of household income, food security, and food assistance. First, food assistance resources appear to be located in closer proximity to poor households, food insecure households, and to low-income households receiving food assistance, compared to their proximity to non-poor households, food secure households, and those low-income households not receiving assistance.

Table 7: Food Resource Access among Households at or below 300% of the Federal Poverty Line (FPL) by Neighborhood Characteristics and Regular Access to a Car in Wave 1 of the MRRS

| Wave 1 Household Characteristics | Measure of Food Resource Access in Wave 1 | | | | | | |
|----------------------------------|---|-------------------|-------------------|-------------------|-------------------|----------------------------|---|
| | Average Distance in Miles to Nearest ... | | | | | Average Number of . . . | |
| | SNAP Office (1) | Food Pantry (2) | SNAP Retailer (3) | SNAP Grocery (4) | Grocery Store (5) | SNAP HHs within 1 mile (6) | Grocery Stores within 10-minute drive (7) |
| Income <=100 of FPL | | | | | | | |
| Urban Resident | 1.63 ^a | 0.57 ^a | 0.17 ^a | 0.51 | 0.33 | 2,254 ^a | 1.88 ^a |
| Suburban Resident | 3.39 ^a | 1.45 ^a | 0.40 ^a | 0.54 | 0.49 | 801 ^a | 0.53 ^a |
| Household Has No Car | 2.21 ^a | 0.80 ^a | 0.25 | 0.50 | 0.38 | 1,897 ^a | 1.46 ^a |
| Household Has Car | 2.72 ^a | 1.17 ^a | 0.30 | 0.54 | 0.43 | 1,267 ^a | 1.02 ^a |
| High-Poverty Tract | 1.74 ^a | 0.56 ^a | 0.16 ^a | 0.45 | 0.30 ^a | 2,136 ^a | 1.68 ^a |
| Low-Poverty Tract | 3.52 ^a | 1.59 ^a | 0.45 ^a | 0.62 | 0.56 ^a | 729 ^a | 0.61 ^a |
| Majority Black Tract | 1.97 ^a | 0.61 ^a | 0.20 ^a | 0.50 ^a | 0.34 ^a | 2,087 ^a | 1.60 ^a |
| Majority Non-black Tract | 3.40 ^a | 1.70 ^a | 0.42 ^a | 0.57 ^a | 0.52 ^a | 563 ^a | 0.55 ^a |
| Income 100–200% of FPL | | | | | | | |
| Urban Resident | 1.58 ^a | 0.64 ^a | 0.18 ^a | 0.49 | 0.34 ^a | 2,317 ^a | 1.99 ^a |
| Suburban Resident | 3.77 ^a | 1.51 ^a | 0.41 ^a | 0.64 | 0.58 ^a | 558 ^a | 0.54 ^a |
| Household Has No Car | 2.82 | 1.31 | 0.32 | 0.56 | 0.48 | 1,285 | 1.12 ^a |
| Household Has Car | 3.37 | 1.28 | 0.37 | 0.62 | 0.53 | 904 | 0.82 ^a |
| High-Poverty Tract | 1.43 ^a | 0.69 ^a | 0.15 ^a | 0.43 | 0.28 ^a | 2,299 ^a | 1.97 ^a |
| Low-Poverty Tract | 3.92 ^a | 1.52 ^a | 0.43 ^a | 0.67 | 0.61 ^a | 494 ^a | 0.49 ^a |
| Majority Black Tract | 1.75 ^a | 0.71 ^a | 0.20 ^a | 0.51 | 0.35 | 2,237 ^a | 1.90 ^a |
| Majority Non-black Tract | 3.78 ^a | 1.51 ^a | 0.41 ^a | 0.64 | 0.58 | 531 ^a | 0.53 ^a |

Notes. ^{a,b,c,d,e,f} – Cell-pair comparisons are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the federal poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession & Recovery Study (MRRS).

Table 8: Food Resource Access among Households at or below 300% of the Federal Poverty Line (FPL) by Neighborhood Characteristics and Regular Access to a Car in Wave 1 of the MRRS

| Wave 1 Household Characteristics | Percentage of Households in Wave 1 | | | | | | | |
|----------------------------------|------------------------------------|-----------------------|-----------------------|--------------------------|----------------------|---------------------------------|-----------------------|-----------------------|
| | Distance to Nearest SNAP Office | | | Within 1 Mile of a . . . | | Distance to Nearest Food Pantry | | |
| | Within 1 Mile (1) | Within 2 Miles (2) | Within 3 Miles (3) | SNAP Grocery (4) | Grocery Store (5) | Within 1 Mile (6) | Within 2 Miles (7) | Within 3 Miles (8) |
| Income <=100 of FPL | | | | | | | | |
| Urban Resident | 18.3 | 71.6 ^a | 91.7 ^a | 92.6 | 100.0 | 90.3 ^a | 99.5 ^a | 100.0 ^a |
| Suburban Resident | 10.1 | 16.7 ^a | 44.1 ^a | 82.7 | 86.7 | 33.8 ^a | 71.1 ^a | 88.9 ^a |
| Household Has No Car | 15.0 | 51.6 | 77.3 | 92.2 | 97.7 | 74.5 ^a | 92.4 | 97.7 |
| Household Has Car | 13.8 | 39.2 | 60.8 | 83.7 | 89.7 | 52.4 ^a | 79.7 | 91.8 |
| High-Poverty Tract | 19.0 | 65.2 ^a | 93.9 ^a | 91.7 | 100.0 ^a | 91.9 ^a | 97.6 ^a | 98.1 |
| Low-Poverty Tract | 7.8 | 16.8 ^a | 33.3 ^a | 82.3 | 84.5 ^a | 22.4 ^a | 69.2 ^a | 89.8 |
| Majority Black Tract | 14.7 | 58.6 ^a | 87.2 ^a | 92.5 | 100.0 | 84.2 ^a | 97.4 ^a | 100.0 ^a |
| Majority Non-black Tract | 13.8 | 20.4 ^a | 34.8 ^a | 79.1 | 81.8 | 24.1 ^a | 64.5 ^a | 84.8 ^a |
| Income 100–200% of FPL | | | | | | | | |
| Urban Resident | 22.1 | 74.1 ^a | 95.6 ^a | 92.3 | 100.0 ^a | 84.4 ^a | 92.2 | 100.0 |
| Suburban Resident | 6.1 | 13.9 ^a | 32.4 ^a | 85.1 | 81.1 ^a | 24.3 ^a | 78.7 | 90.9 |
| Household Has No Car | 12.5 | 34.8 | 55.8 | 87.9 | 90.8 | 48.6 | 76.5 | 91.5 |
| Household Has Car | 9.2 | 26.9 | 45.6 | 86.5 | 84.0 | 35.9 | 84.2 | 93.9 |
| High-Poverty Tract | 29.5 ^a | 81.5 ^a | 97.3 ^a | 93.0 | 100.0 ^a | 84.5 ^a | 91.6 | 98.7 |
| Low-Poverty Tract | 2.6 ^a | 8.7 ^a | 29.4 ^a | 84.5 | 80.4 ^a | 21.9 ^a | 78.4 | 91.1 |
| Majority Black Tract | 20.2 | 70.8 ^a | 91.5 ^a | 92.9 | 100.0 ^a | 78.2 ^a | 91.0 | 100.0 |
| Majority Non-black Tract | 6.3 | 13.2 ^a | 32.0 ^a | 84.6 | 80.5 ^a | 24.7 ^a | 78.7 | 90.6 |

Notes: ^{a,b,c,d,e,f} – Cell-pair comparisons are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the federal poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession & Recovery Study (MRRS).

Second, poor and near-poor households receiving food assistance live amidst larger concentrations of food assistance recipients than comparably poor households that do not receive assistance. While disadvantaged households on average are slightly closer to food retailers of all types, most households are within a mile of a grocery store or supermarket, whether they accept SNAP or not. Finally, inequality in access to food resources appears to operate at the disadvantage of poor and near-poor residents of suburban and low-poverty areas. Such findings run counter to previous research on food deserts and food retailer access that use census tracts as the unit of analysis. Our snapshot here cannot uncover whether food assistance recipients are more likely to locate near offices and relevant retailers, or whether offices and retailers locate nearer food assistance recipients, but our findings suggest that low-income food assistance recipients appear to have closer access to food resources than those low-income households that do not receive assistance.

Factors Associated with Food Assistance Receipt

To better understand how demographic characteristics, economic shocks, and food resource access is related to household receipt of food assistance, we estimated a set of probit models that examine factors associated with receipt of SNAP or receipt of assistance from a nonprofit charity among households with income at or below 300 percent of poverty. Results are reported in Tables 9 and 10.

As expected, several demographic characteristics are associated with household receipt of food assistance. Black respondents were more likely to report receipt of SNAP and charitable assistance, as were those respondents with low levels of educational attainment. We also find that households experiencing any period of unemployment in the previous year are more likely to receive food assistance. We also observe strong positive relationships between households not in the labor force where the respondent has a health limitation and food assistance receipt.

We find access to food assistance resources and food retailers at times to be associated with receipt of SNAP or charitable assistance. Table 10 reports probit coefficients for several different measures of food resource access when these alternative access measures are included with the same set

Table 9: Factors Associated with SNAP and Charitable Assistance Receipt among Households at or below 300% of the Federal Poverty Line (FPL), Probit Coefficients Reported

| | Receive SNAP | Receive Charitable Assistance |
|--|--------------------|-------------------------------|
| Distance to Closest SNAP Office | -.014 (.035) | — |
| Distance to Closest Food Pantry | — | -.045 (.077) |
| Respondent Race - Black | .792** (.127) | .705** (.124) |
| Household with Children | .578** (.170) | .205 (.134) |
| Respondent Age | | |
| 19–24 Years Old | .220 (.293) | -.445* (.165) |
| 25–34 Years Old | .210 (.143) | -.162 (.178) |
| 35–44 Years Old | .159 (.207) | -.060 (.222) |
| Respondent Married | -.541* (.196) | -.066 (.093) |
| Respondent Completed Education | | |
| Less than High School | 1.052** (.219) | .653* (.257) |
| High School but no B.A. degree | .471** (.167) | .539** (.207) |
| Respondent Employment Status in Previous 12 Months | | |
| Unemployed 1–6 months | .359** (.117) | .479+ (.254) |
| Unemployed 7–12 months | .671** (.142) | .162 (.144) |
| NILF, no health limitation | .218 (.269) | -.245 (.298) |
| NILF, with health limitation | 1.347** (.273) | .708* (.297) |
| Frequent Religious Attendance | .049 (.085) | -.021 (.131) |
| Owens or Leases a Car | -.096 (.126) | -.162 (.119) |
| Was or is a Union Member | -.153 (.128) | -.056 (.130) |
| Wave 1 | -.264** (.092) | .100 (.108) |
| Constant | -1.596** (.187) | -1.873** (.322) |
| N | 949 | 960 |

Note: ** p< .01, * p< .05, + p< .10. Models were estimated using pooled Wave 1 and 2 data, household survey weights, and clustered standard errors. Reference categories for categorical predictors are: Age (45 and over), Education (B.A. or more), Unemployment (no unemployment). Standard errors are in parentheses.

Source: Michigan Recession & Recovery Study (MRRS).

Table 10: Relationship between Food Resource Access and Receipt of Assistance among Households at or below 300% of the Federal Poverty Line (FPL), Probit Coefficients Reported

| Measure of Food Resource Access | Receive SNAP | Receive Charitable Assistance |
|---|---------------------------------|---|
| Distance to Closest SNAP Office | -.014 (.035) | -.010 (.033) |
| Within 1 Mile of SNAP Office | .362** (.126) | .340⁺ (.191) |
| Within 2 Miles of SNAP Office | .121 (.145) | .069 (.150) |
| Within 3 Miles of SNAP Office | .058 (.147) | .064 (.139) |
| Number of Households Receiving SNAP Within 1 Mile | .0002* (.0001) | .0001⁺ (.00006) |
| Distance to Closest SNAP Retailer | -.381 (.270) | -.022 (.354) |
| Within 1 Mile of a SNAP Retailer | -.070 (.267) | .285 (.440) |
| Distance to Closest SNAP Grocery Store or Supermarket | -.271* (.118) | -.014 (.153) |
| Within 1 Mile of SNAP Grocery Store or Supermarket | .152 (.123) | -.080 (.208) |
| Distance to Closest Grocery Store or Supermarket | -.219 (.132) | -.184 (.234) |
| Within 1 Mile of Grocery Store or Supermarket | -.096 (.264) | .128 (.356) |
| Number of Grocery Stores or Supermarkets Within 10 Minute Drive | .110 (.108) | .004 (.055) |
| Distance to Closest Food Pantry | -.080 (.138) | -.045 (.077) |
| Within 1 Mile of a Food Pantry | .163 (.191) | -.074 (.135) |
| Within 2 Miles of a Food Pantry | .064 (.288) | -.079 (.188) |
| Within 3 Miles of a Food Pantry | -.172 (.412) | .742** (.223) |

Note: ** p< .01, * p< .05, ⁺ p< .10. Models were estimated using pooled Wave 1 and 2 data, household survey weights, and clustered standard errors. Standard errors are in parentheses. Full model specification includes covariates reported in Table 9.

Source: Michigan Recession & Recovery Study (MRRS).

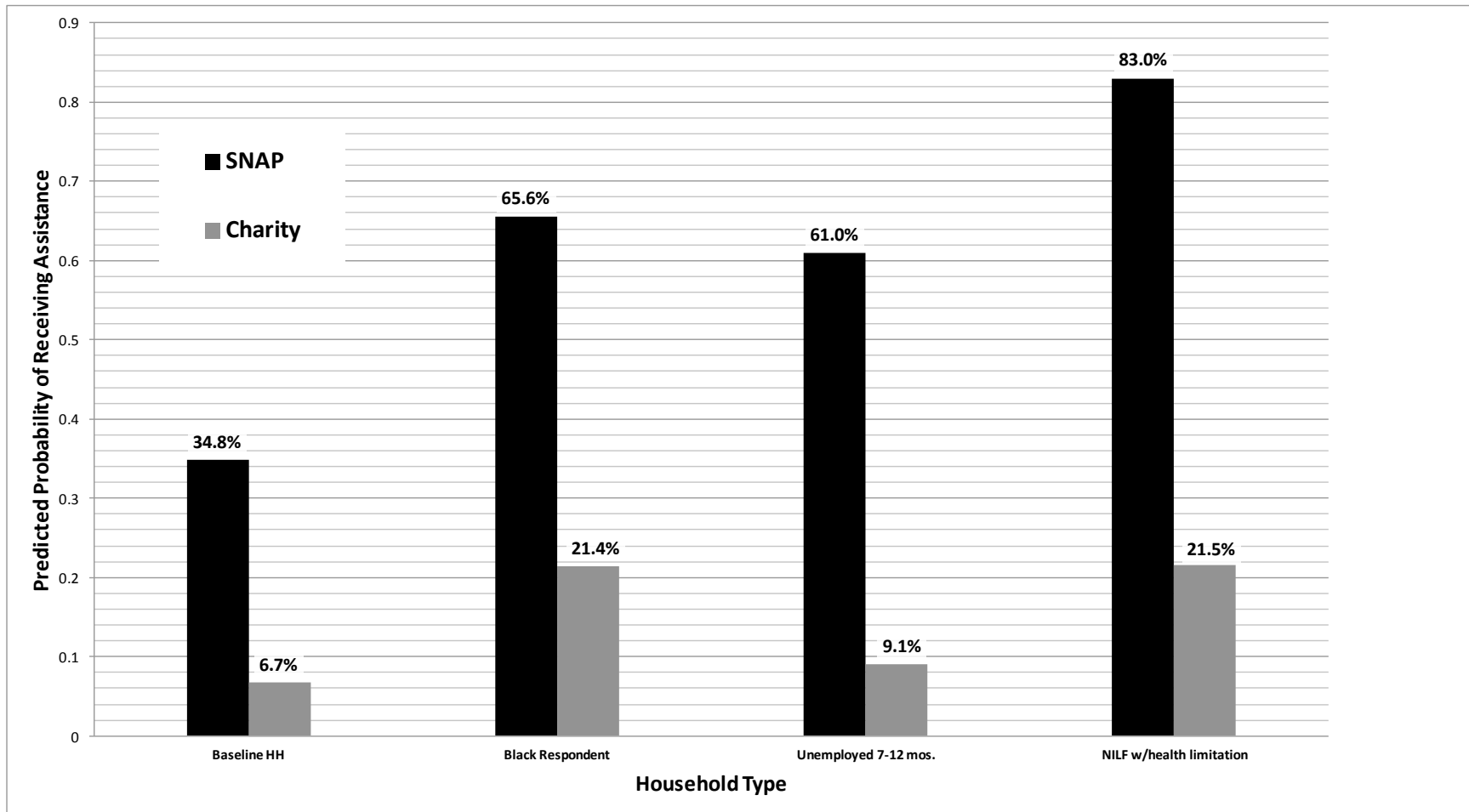
of covariates reported in Table 9.¹⁹ While distance to the closest SNAP administrative office or food pantry does not appear to be related to receipt of food assistance, we do find that living within one mile of a SNAP office is positively related to both SNAP receipt and receipt of charitable assistance, even when controlling for other household demographic and economic characteristics. Uncovering more evidence in support of a threshold hypothesis for food resource access, we find that while living within a mile of a food pantry has no significant association with receiving charitable food assistance, living within three miles of a food pantry has a strong and positive relationship to receipt of assistance from nonprofit charities.

To convey effect sizes, we translate our probit coefficients into predicted probabilities of receiving SNAP or charitable assistance in Figures 1 and 2 using a hypothetical baseline case and toggling key right-hand side measures. Our baseline case is a not-married, nonblack household with children living one half mile from a SNAP administrative office, between ages 25 and 34 with a high school degree at Wave 1. The baseline household also has been employed in all twelve months prior to the survey, has a car, frequently attends religious services, and is not a union member.

Predicted probabilities reported in Figure 1 highlight the importance of key household characteristics in explaining food assistance receipt. Race and unemployment have large substantive effects on food assistance receipt, nearly doubling the likelihood that a household receives SNAP and increasing the likelihood of charitable assistance significantly. Consistent with the existing literature, households where the respondent is out of the work force with a health limitation are more than twice as likely to receive SNAP and more than three times as likely to receive charitable food assistance as the baseline case.

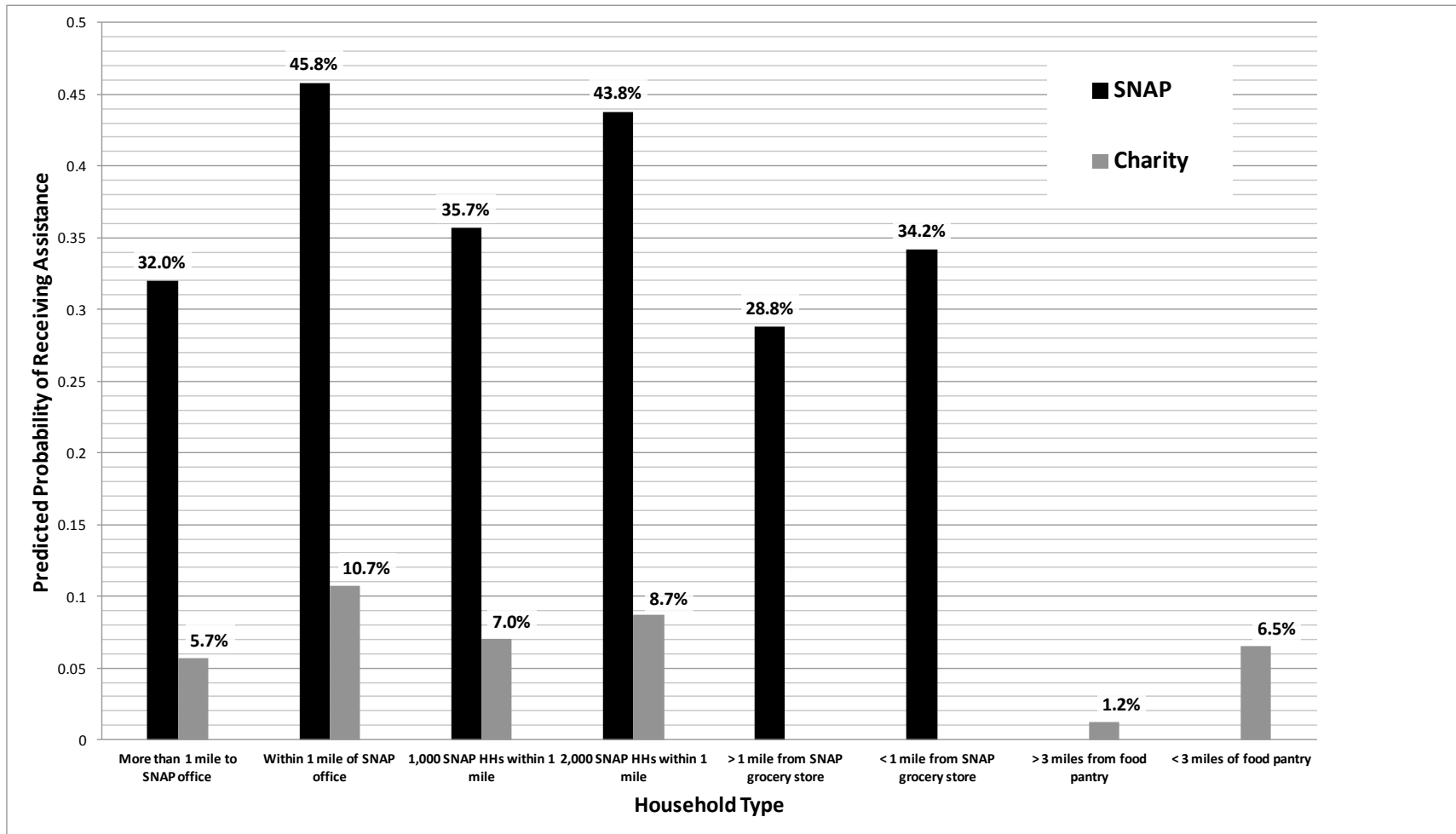
¹⁹Coefficients for these other covariates are not reported in Table 10, although it should be noted that the substitution of different access measures into the baseline model presented in Table 9 does not significantly change the parameter estimates for other covariates.

Figure 1: Predicted Probability of Receiving SNAP or Charitable Food Assistance, Demographic and Economic Characteristics



Source: Michigan Recession & Recovery Study (MRRS).

Figure 2: Predicted Probability of Receiving SNAP or Charitable Food Assistance, Food Resource Access Measures



Source: Michigan Recession & Recovery Study (MRRS).

Figure 2 demonstrates the importance of spatial access to food resources.²⁰ For example, being within one mile of a SNAP administrative office increases the likelihood of receiving SNAP assistance by about one-third over the baseline case where the household is more than a mile away from a SNAP office (45.8 percent versus 32.0 percent). Closer proximity to a SNAP administrative office also is associated with a higher likelihood of receiving charitable nonprofit food assistance (10.7 percent versus 5.7 percent).

NEXT STEPS AND IMPLICATIONS

Several important findings emerge from this project. First, we find food insecurity to be quite prevalent among poor and near-poor households in metro Detroit following the Great Recession. Fifty-one percent of households below the federal poverty line and 36 percent of households with income below 200 percent of federal poverty were food insecure in the year prior to Wave 1 of the MRRS. Consistent with effects of the economic recovery, the prevalence of food insecurity declined slightly between waves of the MRRS. Nevertheless, about one-third of all households with income less than 300 percent of federal poverty were classified as food insecure in Wave 2.

Second, we find food assistance, SNAP in particular, to have become a critical source of support for poor and near-poor households in metropolitan Detroit. Nearly 70 percent of households with income below the poverty line report receiving SNAP benefits at some point in the prior year. About one-third of households with income between 100 and 200 percent of federal poverty reported receiving SNAP in the prior year. Receipt of charitable food assistance is less common among poor and near-poor households in Detroit than is receipt of SNAP. About one-third of poor households report receiving charitable food assistance and roughly 15 percent of households between 100 and 200 percent of poverty report receiving help from nonprofit charities.

²⁰Models are estimated separately for each measure of food resource access, so the predicted probability for the baseline case will be slightly across different measures of food resource access.

Consistent with existing research, we find that being out of work and disconnected from the labor market due to a physical health limitation are associated with increased household use of food assistance. We find other household characteristics—race, presence of children, educational attainment, and marital status—also to be associated with food assistance receipt.

Finally, this study finds evidence that low-income households receiving SNAP reside closer on average to both SNAP administrative offices and food pantries than low-income households that do not receive SNAP. There also is some evidence that poor households receiving SNAP are located slightly closer to SNAP retailers and chain grocery stores than poor households not receiving SNAP. In contrast to expectations from some of the existing literature on food deserts, however, we find that poor households in Detroit on average are slightly closer to the nearest SNAP retailer, SNAP grocery store, or chain grocery store than households in suburban areas.

We also find evidence that access to food assistance resources may be related to food assistance receipt. Our results indicate that closer proximity or greater spatial access to food assistance resources may be positively associated with SNAP take-up and food pantry receipt. Similarly, we find proximity to larger numbers of SNAP recipients also increases the likelihood a household reports participation in SNAP. Results presented here suggest that access to resources at or above a certain threshold affects behavior or choice, suggesting that the relationship between food resource access and food outcomes may be nonlinear.

Future analyses of these data will explore how household demographic characteristics, economic shocks, food resource access, and food assistance are associated with grocery shopping habits and food security in the MRRS. Tables 11 and 12 preview initial results from this ongoing research. Consistent with other research, our research finds that nearly all households within 300 percent of federal poverty report shopping at a grocery store or supermarket to purchase groceries (see Table 11). Households also purchase food regularly from other types of food retailers, including specialty stores, convenience stores, and drug stores. We find that about one-third of poor households switched the store where most grocery shopping was done in the prior year. Many respondents cited prices, affordability considerations,

Table 11: Grocery Shopping Behavior among Households at or below 300% of the Federal Poverty Line (FPL) in the MRRS

| Household Income and Access to Car in Wave 2 | Percentage of Households | | | | | | | |
|---|--------------------------------|--------------------|----------------------|-------------------------|------------------------------------|---|-------------------|-----------------------------|
| | Where Household Buys Groceries | | | | Switched Store or Store Type | Why Switched Stores | | |
| | Grocery Store | Specialty Store | Convenience Store | Drug Store | | Prices/More Affordable/Can't Afford Old Store | More Convenient | Change in Transportation |
| <= 100% of FPL | 96.9^a | 19.2 | 13.1 | 35.7^a | 32.5^{ab} | 60.1^a | 21.9 | 29.3^a |
| SNAP Recipients | 94.7 ^b | 21.2 | 9.8 | 36.9 | 33.0 | 69.4 | 14.9 | 13.1 ^b |
| Charity Recipients | 99.3 ^b | 17.0 | 16.7 | 34.5 | 32.0 | 49.8 | 29.6 | 47.2 ^b |
| 100–200% of FPL | 99.2 | 27.6 | 8.5 | 23.0^a | 10.7^{ac} | 88.9^a | 44.6 | 17.6 |
| SNAP Recipients | 100.0 | 29.6 | 7.5 | 23.6 | 12.1 | 94.3 | 54.4 ^a | 18.0 |
| Charity Recipients | 97.1 | 22.2 | 11.4 | 21.4 | 7.0 | 64.4 | 0.0 ^a | 15.8 |
| 200–300% of FPL | 100.0^a | 21.2 | 13.8 | 27.4 | 23.8^{bc} | 67.9 | 20.6 | 8.4^a |
| SNAP Recipients | 100.0 | 22.5 | 14.4 | 28.5 | 26.7 ^d | 69.0 ^b | 20.9 ^b | 8.5 ^c |
| Charity Recipients | 100.0 | 12.4 | 9.4 | 19.5 | 3.1 ^d | 0.0 ^b | 0.0 ^b | 0.0 ^c |

Notes: ^{a,b,c} – Within column cell-pair comparisons are statistically different at the .10 level or below. Household survey weights applied. Results reflect households that reported income at or below 300 percent of the national poverty line in both waves. Unweighted $N = 485$.

Source: Michigan Recession and Recovery Study (MRRS).

Table 12: Factors Associated with Food Insecurity among Households at or below 300% of the Federal Poverty Line (FPL)

| | Probit | Bivariate Probit | IV Probit |
|--|--------------------|---------------------|-------------------|
| Receive SNAP | .208 (.163) | .091 (.502) | 1.672 (1.117) |
| Respondent Race - Black | .189 (.115) | .218 (.152) | -.229 (.357) |
| Household with Children | -.003 (.183) | .018 (.228) | -.267 (.256) |
| Respondent Age | | | |
| 19–24 Years Old | -.511* (.190) | -.495* (.186) | -.507+ (.275) |
| 25–34 Years Old | .174 (.172) | .178 (.164) | .048 (.204) |
| 35–44 Years Old | .124 (.136) | .130 (.137) | .041 (.167) |
| Respondent Married | -.096 (.210) | -.116 (.223) | .162 (.324) |
| Respondent Completed Education | | | |
| Less than High School | 1.029** (.201) | 1.063** (.258) | .371 (.794) |
| High School but no B.A. degree | .826** (.187) | .835** (.206) | .505 (.494) |
| Respondent Employment Status in Previous 12 Months | | | |
| Unemployed 1–6 months | .371+ (.205) | .382+ (.214) | .133 (.342) |
| Unemployed 7–12 months | .274 (.226) | .294 (.264) | -.077 (.395) |
| NILF, no health limitation | .397 (.540) | .398 (.540) | .244 (.568) |
| NILF, with health limitation | .530+ (.272) | .573 (.361) | -.176 (.704) |
| Owens or Leases a Car | .126 (.157) | .118 (.160) | .159 (.120) |
| Wave 1 | .212* (.102) | .208+ (.107) | .261** (.081) |
| Constant | -1.613** (.265) | -1.604** (.259) | -1.331* (.614) |
| Correlation of Error Terms – Bivariate Probit | — | .072 (.252) | — |
| N | 949 | 945 | 949 |

Note: ** p < .01, * p < .05, + p < .10. Models were estimated using pooled Wave 1 and 2 data, household survey weights, and clustered standard errors. Reference categories for categorical predictors are: Age (45 and over), Education (B.A. or more), Unemployment (no unemployment). Standard errors are in parentheses.

Source: Michigan Recession & Recovery Study (MRRS).

convenience, and changes in transportation as the main reasons behind these changes. Subsequent analyses will examine how access to different types of food retailers is related to the mix of stores used for grocery shopping and to shifts in this mix.

Additional research will examine whether SNAP receipt is associated with greater food security. Again, we preview results from preliminary models in Table 12. Here we compare results from probit and bivariate probit models predicting food security to a probit model using an instrumental variables approach to address the selection into SNAP (see Daponte, Sanders, and Taylor, 1999; Gibson-Davis and Foster, 2006; Gundersen and Oliveira, 2001; Nord and Golla, 2009). While each approach makes different assumptions about the underlying relationship between food assistance and food security, receipt of SNAP does not seem to be significantly associated with reported household food security.

Moving forward, we anticipate producing several manuscripts to submit to peer-reviewed academic journals and reports targeted at the policy community. First, we will complete work on a manuscript exploring the bundling of food assistance with other sources of public and charitable support. Next, we will finish work on a manuscript that examines how household demographic characteristics, economic conditions, and food resource access are associated with receipt of SNAP and food pantry assistance. Finally, we will produce two additional manuscripts that examine the determinants of food shopping behaviors and food security more directly. As we complete these manuscripts, we hope to submit discussion papers to the Institute for Research on Poverty (IRP) and to the National Poverty Center, as well as briefs for the *Focus* and *Fast Focus* series at IRP.

TECHNICAL APPENDIX

Michigan Recession and Recovery Survey (MRRS). Determinations of household low-income status in Wave 1 are based on income for calendar year 2008 and for Wave 2, calendar year 2010. Household income is drawn from a single question and verified through checking responses to different sources of income. In the single question, MRRS asked each respondent, “Now thinking about you and your household, what do you estimate was the total income in 2008 for you and all other people living here from all sources, including earnings from work, any business, plus food stamp payments, child support, any government benefits, retirement income and any interest or investment income, before taxes?” For Wave 1, the federal poverty threshold for a single-parent household with two children in 2008 was \$17,600. Households within 300 percent of this threshold have annual income at or below \$52,800. Pooled across the two waves, 42.9 percent of MRRS respondents reported household income within 300 percent of the federal poverty line. Table 2 reports the characteristics of MRRS respondents within 300 percent of the federal poverty line using data pooled across the two waves of the survey.

Respondents indicated whether they were receiving public health insurance and housing assistance at the time of the survey. Measures of TANF, SNAP, UI, and EITC receipt are based on whether respondents received such assistance in the past 12 months. The MRRS does not allow us to assess in which months households are eligible for programs and in which months they receive program assistance. Rates of public program receipt have been benchmarked against 2009 Current Population Survey data reported in the March 2010 Survey for the three-county Metropolitan Detroit area. We find reported rates of program participation to be very similar between the MRRS and CPS. In addition, all measures of public benefit receipt are weighted using household survey weights, with the exception of public health insurance receipt. Public health insurance was asked of individual respondents rather than whether anyone in the household had public health insurance, so we use individual survey weights when reporting rates of public health coverage.

Food Pantry Survey. A list of 407 charitable nonprofit food pantries or emergency food programs located in the study area of the MRRS were compiled from online directory listings and the United Way of Southeastern Michigan 2-1-1 directory in Spring 2012. A letter of invitation to participate in a short survey was sent to each listed pantry. A 10-minute telephone survey instrument collecting information about location, program services, client characteristics, and funding was developed and pilot-tested with five Chicago-area food pantries. Survey call attempts began in August 2012 and were completed in April 2013. Surveys were completed at the Population Research Center at NORC and the University of Chicago by a trained telephone survey interviewer.

When reaching a food assistance program, the survey interviewer asked to speak to the program executive or to a program manager that could answer some basic questions about the programs available on-site. Many organizations were not eligible for the survey: 37 were no longer operational; 29 were not food assistance programs; contact information could not be located for nine other listings. Surveys were completed with 263 of the remaining 332 listed programs for a response rate of 80.2 percent. Twelve programs refused to participate in the survey and 57 programs were never reached to complete calls. All organizations not completing surveys were contacted at least 10 times by the interviewer, but only 37 of the 57 programs not reached appeared to have a functioning phone system. A total of 1,674 call attempts were made.

Providers offered a range of services to low-income individuals on-site. Nearly 90 percent offered groceries—most through a food pantry program. One-third provided meals on-site to low-income and three-quarters provided non-food related benefits (e.g., housing assistance or shelter, utility assistance, clothing or furniture). Some organizations provided job training, health services, and referrals to other social service providers. Nearly half—49 percent—reported helping clients connect to public assistance programs for which they may be eligible. The average food assistance program served 1,134 individuals in a typical month, although the median provider served 400 in a typical month. Programs averaged 1.5 FTE staff and about 100 volunteer hours per week.

InfoUSA Food Retailer Data. Lists of food retailers operating in the Detroit metropolitan area were obtained from InfoGroup for 2008 and 2010. Files for both years contain information on businesses operating at the end of each year. The business selection criteria were as follows: (1) geographic area: Wayne, Oakland, and Macomb counties in Detroit Metropolitan Area (Michigan) PLUS the adjacent 32 zip code areas; and (2) industrial classification codes (NAICS): 44511, 44512, and 4452. In 2008, there were 2,818 food retail businesses fitting our search criteria and 2,860 food retail businesses matching search criteria in 2010.

SNAP Administrative Office Locations. Office locations where applications for SNAP may be submitted and processed in the three-county Detroit metropolitan area. Information about office locations ($N = 23$) were drawn in March 2011 from the State of Michigan Department of Human Services (DHS) website (<http://www.michigan.gov/dhs/>). Geographic coordinates of each office were then added by geocoding the locations in ArcGIS.

SNAP Retailer Data. Lists of authorized SNAP retailers in the State of Michigan for the years 2008 and 2010 were obtained from the USDA's Food and Nutrition Service program (<http://www.fns.usda.gov/fns/>) via email on October 15, 2012. These lists represent retailers in Michigan that are in an authorized status to receive SNAP at the end of the Fiscal Year (09/30/08 for 2008 data and 9/30/10 for 2010 data). A team of research assistants from the University of Michigan examined each SNAP retailer, entered the address into Google Maps, and located the building in street view. Using the image of the store and the store name, the team coded each retailer into one of seven categories: Grocery store/Chain Grocery (i.e., Kroger); Drug Store/Dollar Store/Chain Retail (i.e., Walgreens, CVS, Target, Dollar Store, Kmart); Gas Station; Mini-mart/Convenience Store/Liquor/Party Store; Bakery/Butcher/Other Specialty Foods; Farmers Market; Other. Coding of stores was check-coded for consistency. Store addresses were geocoded and geographic coordinates of each store were then added to the GIS.

Food Resource Access Measures. Food resource access measures were calculated by determining time and distance between each MRRS respondents' home and a given food resource. Food

resources include location of SNAP administrative offices, food pantries, SNAP retailers, and food retailers regardless of their authorization to receive SNAP. Addresses of the respondents from two waves are geocoded to 2010 Census geography. To calculate access measures, the sum of the number of food retailers or food assistance programs of a given type located within a reasonable commute time (5-, 10-, 15-, 20-, 30-minute) of each MRRS respondent's home was calculated for three different travel modes: driving; public transit; and walking. In addition, Euclidean or straight-line distance in miles to the nearest food resource of a given type for a given mode also was calculated.

The least cost driving time was calculated in ArcGIS using the routing service data from the StreetMap North America dataset 10.1, and under the following assumptions. To calculate the driving time, we restricted the use of private entryways, waterways, and toll roads and asked the software to choose a route to minimize travel time (i.e., time as the impedance), or the quickest route. Walking time was also calculated in ArcGIS and using the same routing service data, and under almost the same assumptions, except one, which restricts the use of limited access roads, namely highways, as it is assumed that pedestrians cannot walk along such roads. The software chose the route that minimized travel distance, or that represented the shortest route. Once the shortest travel route was assigned for each trip between the participant's residence and all destinations, the distance was then translated into travel time, assuming an average comfortable walking speed of 3 miles per hour. Calculation of the public transit travel time was done in Stata, where a "TRAVELTIME" command file retrieves estimated public transit travel time using the Google Transit web service and assuming the Detroit public transportation system (SMART) as the mode of transportation. It should be noted that public transit travel time varies by time and day of the travel. The time of the travel we used was 9:00 a.m., and the day of the travel was Wednesday, September 26, 2012.

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