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The complex relationship between poverty and food insecurity among older Americans

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Abstract

This paper examines the characteristics associated with poverty and food insecurity among households ages 55 and older to better understand what drives the gap between these measures of hardship. The analysis uses data from the 2002 through 2018 Health and Retirement Study to assign households one of four outcomes: poor and food insecure, poor and food secure, nonpoor and food insecure, and nonpoor and food secure. Multinomial logit regressions of the likelihood that households will fall into one of these four outcomes show that poor health is associated with an increased likelihood that both poor and nonpoor households will be food insecure, and a reduced likelihood that households will be nonpoor and food secure. These results highlight the strong correlation between food insecurity and health that goes beyond sociodemographic and economic factors. This information is important for policymakers, Federal agencies, such as the U.S. Department of Agriculture Food and Nutrition Service, nonprofits, food banks, and other community-based organizations that serve food insecure households.

Executive Summary

Over 5 million older Americans are food insecure because they do not have enough food and they cannot afford it (Ziliak and Gundersen 2021). They worry their food will run out, do not consume balanced meals, cut the size of their meals or skip meals to make their food last longer, and are hungry. They are forced to make trade-offs between buying food and paying for other basic needs, such as housing, utilities, health care, and clothing.

Although food insecurity is closely linked with poverty (Feeding America 2018), our knowledge on the nature of this relationship, especially among older adults, remains limited. As in the overall population (Coleman-Jensen et al. 2021; Gundersen, Kreider, and Pepper 2011), the majority of poor seniors are food secure, and most food insecure seniors have incomes above the official poverty line (Ziliak and Gundersen 2021). Moreover, between 2001 and 2017, food insecurity among older adults increased by 45 percent (and very low food security more than doubled) (ibid), while the official poverty rate for seniors remained almost unchanged and even marginally declined (Li and Dalaker 2019). Clearly, senior food insecurity is a complex phenomenon that goes beyond poverty.

This paper examines the characteristics associated with poverty and food insecurity among households ages 55 and older to better understand what drives the gap between these measures of hardship. The analysis uses data from the 2002 through 2018 Health and Retirement Study to assign households one of four outcomes: poor and food insecure, poor and food secure, nonpoor and food insecure, and nonpoor and food secure. It then uses multinomial logit regressions to estimate the likelihood that households will fall into one of these four outcomes. We find that poor physical and mental health increase the likelihood that both poor and nonpoor households will be food insecure, and mental health issues have the largest effect among all the health conditions we analyze. While it is not surprising that poor health also reduces the likelihood that households will be nonpoor and food secure, it is interesting to find that disability is the strongest health-related predictor. Although poor health is not as clearly linked with being poor and food secure, we find an especially strong correlation between disability and the likelihood that households will be poor and food secure. These findings are descriptive and should not be interpreted causally; however, they are robust across different definitions of poverty and different model specifications. So, while poverty and food insecurity are highly correlated, there is a strong correlation between food insecurity and health that goes beyond the sociodemographic and economic factors related to poverty.

Understanding the risk factors for poverty and food insecurity and the relationship between the two is important for nonprofits, food banks, and other community-based organizations that serve food insecure households. In the context of a rapidly aging population, an increasing number of older adults, even those not deemed poor, may be at risk of food insecurity. This may be further exacerbated by cohort effects, since we expect that cohort-specific factors such as preference for continued independent living in old age, further

increase exposure to food insecurity among seniors, including nonpoor seniors. Policymakers may also benefit from this information as it will allow them to plan more accurately how much food-related assistance older adults may need today and in the future, and what risk factors, other than poverty, may be related to higher food insecurity. Federal agencies, such as the U.S. Department of Agriculture Food and Nutrition Service, could use this information to identify the types of food assistance that people need. For example, those who are poor/food insecure need economic assistance such as SNAP, while those who are nonpoor/food insecure may need assistance accessing food (such as meal delivery). Our findings about the importance of health status for the food security of older adults can help inform all food policy stakeholders about the need to consider health status together with economic well-being when determining older adults' risk of becoming food insecure.

Introduction

Over 5 million older Americans are food insecure (Ziliak and Gundersen 2021). Although food insecurity is closely linked with poverty (Feeding America 2018), our knowledge on the nature of this relationship, especially among older adults, remains limited. As in the overall population (Coleman-Jensen et al. 2021; Gundersen, Kreider, and Pepper 2011), the majority of poor seniors are food secure, and most food insecure seniors have incomes above the official poverty line (Ziliak and Gundersen 2021). Moreover, between 2001 and 2017, food insecurity among older adults increased by 45 percent (and very low food security more than doubled) (ibid), while the official poverty rate for seniors remained almost unchanged and even marginally declined (Li and Dalaker 2019). Clearly, senior food insecurity is a complex phenomenon that goes beyond income poverty.

This paper examines the characteristics associated with poverty and food insecurity among households ages 55 and older to better understand what drives the gap between these measures of hardship. We find that while poverty and food insecurity are highly correlated, there is a strong correlation between food insecurity and health that goes beyond the sociodemographic and economic factors related to poverty. Poor physical and mental health increase the likelihood that both poor and nonpoor households will be food insecure, and mental health issues have the largest effect among all the health conditions we analyze. While it is not surprising that poor health also reduces the likelihood that households will be nonpoor and food secure, it is interesting to find that disability is the strongest health-related predictor. Although poor health is not as clearly linked with being poor and food secure, we find an especially strong correlation between disability and the likelihood that households will be poor, but food secure. These findings are descriptive and should not be interpreted causally; however, they are robust across different definitions of poverty and different model specifications and they provide important insights.

Background

A growing body of research has explored the determinants of food insecurity (Gundersen, Kreider, and Pepper 2011; Gundersen and Ziliak 2018). Higher costs of living in the surrounding area can contribute to food insecurity, as households in areas with lower food and heating costs are less likely to be food insecure (Gregory and Coleman-Jensen 2013; Nord and Kantor 2006). Low-income renters with severe housing cost burdens, where they must spend over half their income on housing-related costs, typically reduce their food expenditures by more than a third (Joint Center for Housing Studies 2015). Household composition also matters. Households with children face substantially higher rates of food insecurity than those without children (Coleman-Jensen et al. 2021). Those with residing grandchildren are at least twice as likely to experience food insecurity than households without residing grandchildren (Ziliak and Gundersen 2016). Seniors living alone are also more likely to be food insecure than seniors living with others (Coleman-Jensen et al. 2021).

Other factors associated with food insecurity include limited financial-management skills and lower levels of assets, savings, and access to credit, as well as housing-related challenges and low-wage, low-skill jobs (Gundersen and Garasky 2012; Fitzpatrick and Coleman-Jensen 2014). Rapid and unpredictable changes in income and expenses also increase the likelihood that households will be unable to meet their food needs and will struggle with food hardship (Bartfield and Collins 2017).

Health has also been found to be associated with food insecurity. Households with at least one person with a disability have rates of food insecurity that are substantially higher than households in which no one has a disability (see, for example, Brucker et al. 2015; Brucker and Coleman-Jensen 2017; Heflin, Altman, and Rodriguez 2019; She and Livermore 2007). Coleman-Jensen and Nord (2013) find that food insecurity rates are highest among households with working-age adults who are disabled. Additionally, obesity and physical functioning limitations, in particular instrumental activities of daily living, as well as arthritis, joint pain, poor physical function, and weight-related disability are risk factors for food insecurity among seniors (Brewer et al. 2010; Jackson et al. 2019). Many of those in poor health may be food insecure because they have limited financial resources that force trade-offs between buying food and paying for healthcare and other needs. Gettens and Henry (2019) find that those receiving disability insurance mostly support their consumption with their payments, which results in low levels of consumption. Jih et al. (2018) find that seniors with multiple chronic conditions report high rates of food insecurity, possibly due to high out-of-pocket medical expenses.

Clearly, food insecurity is closely linked to income and often a consequence of poverty. This is concerning for the 1 in 10 Americans ages 65 and older who live in poverty, and the 1 in 4 who are poor or near poor (i.e., living below 200 percent of the federal poverty level) (Cubanski et al. 2018). Many of these older adults are food insecure or at risk of food insecurity. Certain groups of older Americans are in especially precarious situations, including the oldest old, women, unmarried adults, and people of color. For example, in 2017, poverty rates among those 80 and older were more than 3 percentage points higher than for those ages 65 to 69, and they are more than twice as high for older non-Latino blacks and Latinos than for whites (Cubanski 2018). Differences in poverty rates by marital status are particularly stark, with only 4.4 percent of married older adults living in poverty compared with 15.5 percent of unmarried older adults (Li and Dalaker 2019).

Nevertheless, the majority of poor seniors are food secure, and most food insecure seniors have incomes above the official poverty line (Ziliak and Gundersen 2021). This reflects poverty-food insecurity patterns in the overall population (Coleman-Jensen et al. 2021; Gundersen, Kreider, and Pepper 2011). Additionally, Coleman-Jensen and Nord (2013) find that 13 percent of households that included an adult not in the labor force because of a disability had incomes that were at least three times the Federal poverty line but were also considered food insecure. A possible explanation for the gap between poverty and food insecurity may be the way that poverty is measured. The Official Poverty Measure

(OPM) is primarily determined by a family's income and it adjusts only for its size, composition, and age, while disregarding any other factors that may impact economic hardship experienced by individuals or families. In contrast, the Supplemental Poverty Measure (SPM), takes into account a fuller set of resources available to people (e.g., SNAP benefits, tax credits), subtracts non-discretionary expenses (e.g., medical out-of-pocket expenses) from income, and adjusts for differences in the cost of living across different areas as reflected in different costs of rent and utilities.

It is important to recognize that poverty measures are based on a limited number of factors related to current resources and/or needs—that is, economic hardship—whereas food insecurity may be impacted by factors other than economic hardship. Those who are food insecure might live in areas with little or no access to healthy and affordable food, also known as food deserts (Wrigley 2002; Schartz, Buliung, and Wilson 2019). Butrica, Mudrazija, and Schwabish (2021) find that counties with high rates of people with disabilities have limited availability and accessibility of food establishments and that many of these same counties also have high rates of food insecurity. It may also be the case that some health conditions directly affect food security. Certain health conditions, for example, can suppress people's appetites, cause them to forget to eat, or make meal preparation difficult or impossible. A scoping review by Schwartz, Buliung, and Wilson (2019) finds an increased risk of food insecurity among people with disabilities, but especially those with mental health disabilities. Maynard et al. (2018) finds that most of the 39 articles in their meta-analysis of the literature showed associations between depression and food insecurity. Gregory and Coleman-Jensen (2017) find that rates of food insecurity vary across ten major chronic diseases including hypertension/high blood pressure, diabetes, and chronic obstructive pulmonary disease (see also Tarasuk et al. 2013).

Given our research questions and insights from the literature, we propose a set of research hypotheses that we will assess in our analysis, including:

- There are factors beyond those captured by the official and alternative poverty measures that influence food insecurity.
- Since older adults are particularly susceptible to deteriorating health, health-related factors play a particularly important role as determinants of food insecurity that are not adequately reflected in the existing poverty measures.

Data and Methods

Data for this analysis come from the Health and Retirement Study (HRS). The HRS is a nationally representative biennial longitudinal survey of Americans over the age of 50 that began in 1992. The HRS includes detailed information on older adults and their family members, including their income, assets, and most importantly their food security.

Our analysis uses data from the 2002 through 2018 HRS waves.[1] We focus on households where the respondent or spouse is age 55 and older. In each wave, we assign households one of four outcomes: poor and food insecure, poor and food secure, nonpoor and food insecure, and nonpoor and food secure. We measure poverty using income reported in the previous calendar year and the OPM. We determine food insecurity using a survey question that asks respondents whether, since the prior wave (or in the past two years if this is their first interview), they always had enough money to buy the food they needed. We then estimate multinomial logit models of the likelihood that households will be poor/food insecure, poor/food secure, nonpoor/food insecure, or nonpoor/food secure. Our models control for: age, an interaction between marital status and gender (married couple, single female, or single male), educational attainment, race and ethnicity, whether the household has nonrelated cohabiting adults, work status, homeownership[2], financial assets, and various health conditions intended to capture poor health. It is important to note that we are examining the *association* between these factors and not ascribing a causal relationship between any of these factors and the outcomes.

The health conditions include indictors of self-rated fair or poor health, four or more health conditions (from a list that includes high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychiatric problems, and arthritis), a disability, any mental health issues, memory issues, and any difficulty with activities of daily living (bathing, dressing, eating, getting into and out of bed, walking across a room, and using the toilet) or instrumental activities of daily living (using the phone, taking medications, managing money, shopping for groceries, and preparing meals). Age is the age of respondent or spouse, whoever is oldest. Education is the highest educational attainment (no high school diploma, high school graduate, some college, and college graduate) of the respondent and spouse. Race and ethnicity are the race and ethnicity of the respondent. The work status and health variables are coded as 1 if either the respondent or spouse is working, is in poor health, or has a health condition, and 0 if both the respondent and spouse are not working, are in good health, or have no health conditions. The cohabitation, homeowner, and financial assets variables are captured at the household level.

We exclude households where both the respondent and spouse are nursing home residents, those who were not interviewed in a given year, and households with zero weights,

[1] Although the HRS is currently available through 2018, the weights are not yet available. Therefore, we present our descriptive analyses, which are weighted, for 2016. Our multivariate analyses, which are unweighted, include 2002 through 2018.

[2] Homeowners can borrow against their home equity to support their consumption needs. Indeed, Loibl et al. (2021) find that every $10,000 of mortgage borrowing is associated with a 2.2 percentage point decline in food insecurity.

or missing information on income, food security[3], and other variables of interest. Our sample includes 21,760 households representing 105,022 household-years.

As a robustness check, we also measure poverty using the SPM. It captures the same cash resources as those in the OPM, but the SPM also includes realized capital gains and losses, IRA distributions, and noncash benefits and deducts income and payroll taxes[4] and out-of-pocket medical expenses.[5] The OPM thresholds represent the approximate cost of a minimally adequate diet in 1963 multiplied by three to allow for other expenses (Orshansky 1963), adjusted for changes in the consumer price index over time. OPM thresholds vary by family size, composition, and whether the family head is age 65 or older. In contrast, the SPM thresholds include spending for a reference family (one or two adults) of two children on food, clothing, shelter, and utilities and a modest adjustment for other needs, based on five-year average values from the Consumer Expenditure Survey (Short and Garner 2012). The SPM thresholds vary by size and composition of family units, but not by age. SPM thresholds also vary by whether the household rents, owns with a mortgage, or owns without a mortgage.[6] In general, the SPM thresholds are lowest for homeowners without a mortgage and highest for homeowners with a mortgage.

[3] About 1 percent of the sample has missing information on food insecurity. Socioeconomic and health profiles of the respondents with missing information on food insecurity appear more favorable than for those who reported that they are food insecure, but less favorable than for those who reported that they are food secure.

[4] We estimate taxes using the NBER's TAXSIM model. Because the public-use HRS does not include the state of residence, we estimate the taxes respondents would owe assuming they lived in each state and then assign respondents average taxes over all states.

[5] The SPM also accounts for benefits from the Low Income Home Energy Assistance Program (LIHEAP); Special Supplemental Nutrition Program for Women, Infants, and Children; and National School Lunch Program, and deducts work expenses. Because information about these programs is not available in the HRS, we do not account for these in our SPM poverty rate. However, this should not meaningfully impact our poverty estimates since the programs are small in size and, except for LIHEAP, not generally utilized by older adults (Wimer and Manfield 2015).

[6] Additionally, they vary by geographic location to account for differences in the housing cost across states and metropolitan areas. Our analysis, however, does not vary the SPM thresholds by geography.

Descriptive Results

Among households ages 55 and older in 2016, 3.2 percent are poor/food insecure and 82.9 percent are nonpoor/food secure (Figure 1). Another 8.1 percent are poor/food secure and 5.8 percent are not poor/food insecure. Among poor households, 28 percent are food insecure when we would expect a much higher rate. And among nonpoor households, 7 percent are food insecure when, despite findings to the contrary, we would expect no food insecurity.[7] To understand why poverty and food insecurity are not more closely aligned, we explore the sociodemographic, economic, and health characteristics of these households.

Sociodemographic Characteristics

The percentage of households that is married, college educated, and non-Hispanic white is highest for those that are nonpoor/food secure and then gets progressively smaller for those that are nonpoor/food insecure, those that are poor/food secure, and those that are poor/food insecure (Table 1). Among households that are nonpoor/food secure, 57.9 percent are married, 37.9 percent are college educated, and 80.6 percent are non-Hispanic white. In contrast, among those that are poor/food insecure, only 22.6 percent are married, 7.3 percent are college educated, and 41.5 percent are non-Hispanic white. Non-Hispanic black households and Hispanic households are at least 3 times more likely to be poor/food insecure than they are to be nonpoor/food secure.

Food secure households are more likely to be older, married, college educated, and non-Hispanic white than food insecure households, regardless of their poverty status. However, differences between food secure and food insecure households are smaller for poor households than they are for nonpoor households. For example, college graduates live in 12.3 percent of poor/food secure and 7.3 percent of poor/food insecure households (a difference of 5 percentage points), and 37.9 percent of nonpoor/food secure and 17.9 percent of nonpoor/food insecure households (a difference of 20 percentage points). We also observe differences between households that are poor/food secure and those that are nonpoor/food insecure, with the former more likely to be older, single women, without a high school diploma, and non-Hispanic black and Hispanic.

Economic Characteristics

Households that are nonpoor/food secure are economically the best off followed by those that are nonpoor/food insecure, those that are poor/food secure, and those that are poor/food insecure (Table 2). One might think that most nonpoor/food insecure households and most poor/food secure households have incomes that put them just above or just below the poverty threshold, respectively, but the findings do not support this. The income-to-poverty ratio is 3.08 at the mean and 2.03 at the median for nonpoor/food insecure households (well above

[7] We derive 28 percent from (3.2 ÷ (3.2 + 8.1)) and 7 percent from (5.8 ÷ (5.8 + 82.9)).

the poverty threshold), and only 0.58 at the mean and 0.67 at the median for poor/food secure households (well below the poverty threshold).

Households that are poor/food secure are more likely to be homeowners (48.4 percent) than those that are poor/food insecure (34.4 percent). On other economic measures, however, there are no statistically significant differences between these households. Households that are nonpoor/food insecure are worse off than households that are nonpoor/food secure on all economic measures. Nonpoor/food insecure households are significantly less likely to work (42.0 versus 54.6 percent) and to be homeowners (47.7 versus 81.0 percent), and they also have significantly less income and fewer financial assets.

We also observe differences between households that are poor/food secure and those that are nonpoor/food insecure. Employment is lower among poor/food secure households (28.2 percent) than among nonpoor/food insecure households (42.0 percent), and average income of poor/food secure households is only about a sixth and median income only about a third of that of nonpoor/food insecure households. Other differences are not statistically significant.

Health Characteristics

Generally, poor/food insecure households are the unhealthiest, followed by those that are nonpoor/food insecure, those that are poor/food secure, and those that are nonpoor/food secure (Table 3). For example, 65.7 percent of poor/food insecure households and 59.7 percent of nonpoor/food insecure households have a respondent or spouse (or both) who report being in fair or poor health. This contrasts with 49.5 percent of poor/food secure households and only 27.6 percent of nonpoor/food secure households. Additionally, 44.4 percent of poor/food insecure households and 38.0 percent of nonpoor/food insecure households have a respondent and/or spouse with four or more health conditions. This contrasts with 30.6 percent of poor/food secure and only 22.4 percent of nonpoor/food secure households.

Unlike with the economic measures, we find large statistically significant differences in health between poor/food secure and poor/food insecure households. Poor/food secure households are significantly healthier than poor/food insecure households on each of the measures we examine. They are less likely to have fair or poor health, four or more health conditions, a disability, any mental health issues, memory issues, or any ADLs or IADLs. We also find statistically significant differences in health between nonpoor/food insecure and nonpoor/food secure households, with the former reporting significantly worse health on all health measures.

Nonpoor/food insecure households are also unhealthier than poor/food secure households. Among the former, 59.7 percent are in fair or poor health, 38.0 percent have four or more health conditions, 8.9 percent have at least one disability, 62.1 percent have experienced mental health issues, 5.6 percent have memory issues, and 27.1 percent have ADLs or IADLs. Among the latter, in contrast, 49.5 percent are in fair or poor health, 30.6

percent have four or more health conditions, 7.8 percent have at least one disability, 48.7 percent have experienced mental health issues, 5.4 percent have memory issues, and 25.2 percent have ADLs or IADLs. Differences between these households are statistically significant only for fair or poor health, four or more health conditions, and any mental health issues.

Multivariate Analyses

Next, we estimate multinomial logit models of the likelihood that households will be poor/food insecure, poor/food secure, nonpoor/food insecure, or nonpoor/food secure. The marginal effects are presented in Table 4. Generally, households comprised of 55–64-year-olds, single women, those without high school diplomas, non-Hispanic black and Hispanic individuals, those who are not cohabiting, nonworkers, and those who are not homeowners have the *highest* likelihood of being poor/food insecure, poor/food secure, or nonpoor/food insecure and the *lowest* likelihood of being nonpoor/food secure.

Compared with married households, single women are 2.0 percentage points more likely to be poor/food insecure, 4.8 percentage points more likely to be poor/food secure, 1.8 percentage points more likely to be nonpoor/food insecure, and 8.6 percentage points less likely to be nonpoor/food secure. Non-Hispanic Black, Hispanic, and Asian/Native American/other households are more likely to be poor/food insecure or poor/food secure and less likely to be nonpoor/food secure than non-Hispanic white households. Compared with non-Hispanic white households, for example, non-Hispanic Black households are 2.1 percentage points more likely to be poor/food insecure, 6.1 percentage points more likely to be poor/food secure, 1.1 percentage points more likely to be nonpoor/food insecure, and 9.3 percentage points less likely to be nonpoor/food secure.

Several factors are not statistically correlated with being nonpoor/food insecure—including being a single man, educational attainment, cohabiting, and work—although these same factors are correlated with the probability that households will experience one of the other outcomes. Compared with nonworking households, for example, working households are 2.6 percentage points less likely to be poor/food insecure, 8.5 percentage points less likely to be poor/food secure, and 11.0 percentage points more likely to be nonpoor/food secure.

The results in Table 4 also confirm the role that health status plays in poverty and food insecurity beyond sociodemographic and economic factors. Health challenges are associated with a higher likelihood of being poor/food insecure, ranging from 0.5 to 1.5 percentage points depending on the health-related indicator, and is associated with a lower likelihood of being nonpoor/food secure, ranging from 1.1 to 5.2 percentage points depending on the health-related indicator. It is also associated with an increased probability that households are nonpoor/food insecure with the marginal effects ranging from 0.5 to 2.0 percentage points. Health challenges, however, are not as clearly linked with being poor and food secure. In

particular, households with mental health issues, memory issues, or ADLs or IADLs are not any more or less likely to be poor/food secure than those without these health conditions.

Finally, of the health conditions we analyze, mental health issues have the largest marginal effect on being poor/food insecure (1.5 percentage points) and nonpoor/food insecure (2.0 percentage points), while disability has the largest marginal effect on being poor/food secure (2.7 percentage points) and nonpoor/food secure (-5.2 percentage points). Moreover, being in fair or poor health and experiencing disability consistently have significant adverse relationships with poverty and food insecurity.

Relative Risk Ratios

While health status is correlated to some extent with the probability of experiencing each outcome, we also want to know the differential effect of health on these probabilities. The relative risk ratio measures how the risk of experiencing one of three outcomes relative to the risk of being nonpoor/food secure changes for each of the factors we analyze. A relative risk ratio less than 1 indicates that being nonpoor/food secure is more likely, while a relative risk ratio greater than 1 indicates that experiencing one of the other outcomes is more likely.

We find that households with health challenges are more likely to experience one of the other three outcomes than they are to be nonpoor/food secure, and that their risk of being poor/food insecure is greatest, followed (generally) by their risk of being nonpoor/food insecure and their risk of being poor/food secure (Table 5). Households in fair or poor health have a higher risk than households with good or better health of being poor/food insecure (by 79 percent), nonpoor/food insecure (by 47 percent), and poor/food secure (by 34 percent) relative to being nonpoor/food secure. For households with any mental health issues, the risk of being poor/food insecure is 95 percent higher, the risk of being nonpoor/food insecure is 63 percent higher, and the risk of being poor/food secure is 13 percent higher, all relative to being nonpoor/food secure. We observe a similar pattern for households with any ADLs or IADLs, with the risk being higher by 73 percent, 59 percent, and 15 percent for the same three categories of poverty and food insecurity relative to nonpoor/food secure older adults, respectively.

For households with four or more health conditions, the relative risk ratios are similar in magnitude for being poor/food insecure and nonpoor/food insecure.[8] For households with a disability, the relative risk ratio is higher for being poor/food secure (1.59) than for being nonpoor/food insecure (1.48), but still highest for being poor/food insecure (1.92). However, the relative risk ratios for being poor/food secure and nonpoor/food insecure are not statistically significantly different from each other. Finally, the relative risk of being poor/food insecure is 24 percent higher than the risk of being nonpoor/food secure for households where at least one member has been diagnosed with a memory issue, but the

[8] We conduct t-tests of the differences in health coefficients between poor/food insecure, poor/food secure, and nonpoor/food insecure. The results of these are noted in Table 6.

relative risk ratios for poor/food secure and nonpoor/food insecure are not statistically different from zero.

Robustness Checks

To assess the robustness of our findings, we re-estimate the multinomial model using different definitions of poverty. The relative risk ratios for health conditions are presented in Table 6. Panel A reports the results for our main model. Panel B shows how the relative risk ratios change when poverty is defined as income below 75 percent of the federal poverty threshold and Panel C shows how they change when poverty is defined as income below 125 percent of the federal poverty threshold. Finally, Panel D considers the relative risk ratios when poverty is based on the SPM. Differences between our main and alternative models, which we describe below, are only suggestive and not statistically shown to be different.

If households that are poor/food secure or nonpoor/food insecure have incomes that put them just below or above the poverty line, then moving that line slightly should increase the overlap between poverty and food insecurity—that is, the share who are poor/food insecure or nonpoor/food secure. Indeed, the overlap between poverty and food insecurity increases slightly when the poverty threshold is 75 percent. This is because lowering the threshold moves somewhat more households from poor/food secure to nonpoor/food secure than from poor/food insecure to nonpoor/food insecure (not shown). As expected, we observe that the relative risk ratios for being poor/food insecure and poor/food secure decline for most health conditions except for memory issues (for both groups), any ADLs or IADLs (for poor/food insecure), and any mental health and memory issues (for poor/food secure). For example, the relative risk ratio of being poor/food insecure declines 12 percentage points for households with four or more health conditions. For households with a disability, the relative risk ratio of being poor/food secure declines 8 percentage points. The effect of lowering the poverty threshold is mixed with regard to the relative risk ratio of being nonpoor/food insecure; it increases for some health conditions and declines for others. The relative risk ratio of being nonpoor/food insecure declines 6 percentage points for households with a disability but increases 3 percentage points for those with any mental health issues. Importantly, even lowering the poverty threshold, mental health issues still have the largest effect on being poor/food insecure and nonpoor/food insecure, while disability has the largest effect on being poor/food secure.

The overlap between poverty and food insecurity actually declines when the poverty threshold is 125 percent. This is because raising the threshold moves many more households from nonpoor/food secure to poor/food secure than from nonpoor/food insecure to poor/food insecure (not shown). As expected, we observe that the relative risk ratios for being poor/food insecure and poor/food secure increase for most health conditions. For households with a disability, the relative risk ratio of being poor/food insecure increases 8 percentage points and the relative risk ratio of being poor/food secure increases 6 percentage points. For households with four or more health conditions, however, the relative risk ratio for both

outcomes declines 3 percentage points. Raising the poverty threshold has little effect on the relative risk ratios of being nonpoor/food insecure for households with most health conditions. However, it does reduce the relative risk ratio by 6 percentage points for those with any mental health issues. Nonetheless, mental health issues still have the largest effect on being poor/food insecure and nonpoor/food insecure, while disability has the largest effect on being poor/food secure.

The overlap between poverty and food insecurity also declines when poverty is measured using the SPM. Consistent with Wight et al. (2014), most relative risk ratios increase using the SPM. The increase is largest for memory issues and the risk of being poor/food insecure (10 percentage points) or poor/food secure (14 percentage points). It is also largest for any ADLs or IADLs and the risk of being nonpoor/food insecure (8 percentage points). For households with a disability, the relative risk ratios decline for the risk of being poor/food insecure (20 percentage points) and the risk of being poor/food secure (19 percentage points). For those in fair or poor health, the relative risk of being poor/food insecure and poor/food secure increases, while the relative risk of being nonpoor/food insecure declines slightly. With the SPM, mental health issues still have the largest effect on being poor/food insecure and disability has the largest effect on being poor/food secure. However, ADLs and IADLs have the largest effect on being nonpoor/food insecure and mental health issues are a close second.

In addition to the robustness checks described above, we also reestimate the multinomial logit model including tract-level unemployment rate, median house value, median rent, and urbanicity to capture local conditions and cost-of-living. While the marginal effects and relative risk ratios differ somewhat from those in Table 4 and Table 5, the takeaways are unchanged.[9]

Transitions

Next, we consider transitions to different poverty and food security outcomes and how different factors might be correlated with these transitions. We focus specifically on worsening conditions, where the dependent variable captures a change from nonpoor/food secure to any of the other three outcomes, a change from nonpoor/food insecure to poor/food secure or poor/food insecure, or a change from poor/food secure to poor/food insecure.[10] We refine the sample to include households in 2 or more consecutive waves.

[9] We do not present these results; however, they are available upon request.

[10] In contrast to households that are poor/food secure, some households that are nonpoor/food insecure may have the economic means to become food secure by purchasing food. For this reason, we consider households that are nonpoor/food insecure to be better off than those that are poor/food secure. However, this ranking may not be accurate for all households.

Even controlling for age, education, work, and wealth, we find that worsening health is positively correlated with worsening economic and/or food security (Table 7). Of the health conditions we analyze, falling into fair or poor health has the smallest effect (0.7 percentage points) and the onset of a disability has the largest effect (2.2 percentage points) on the likelihood that households will experience worsening economic and/or food security. The only health condition that is not statistically significant is the onset of mental health issues.

Discussion

This paper examines the relationship between poverty and food insecurity among older households. One aim, in particular, is to better understand why there are households that are poor, but food secure and others are nonpoor, but food insecure. Our hypotheses are that this is attributable to the importance of factors not captured or only partially captured by the existing poverty measures, most notably older adults' health status. We address this using data from the HRS and estimating multinomial logit models of the likelihood that households will be poor and food insecure, poor and food secure, nonpoor and food insecure, and nonpoor and food secure. In support of our hypotheses, the results show that poor health is associated with an increased likelihood that both poor and nonpoor households will be food insecure, and a reduced likelihood that households will be nonpoor and food secure. Yet, they also reveal a more nuanced and complex relationship of health and poverty and food insecurity. In contrast to the strong correlation between poor health and these other outcomes, we find the link between poor health and the likelihood of being poor and food secure to be generally much more tenuous. To put the importance of health in perspective, we find that the predicted probability of experiencing poverty and food insecurity declines 56 percent and the predicted probability of being nonpoor and food insecure declines 39 percent if households are healthy on all measures, but the predicted probability of experiencing poverty and food security declines only 7 percent assuming households are healthy. This finding suggests that the correlation between health and food insecurity is stronger than the correlation between health and poverty. Of the health conditions we analyze, mental health issues have the largest marginal effect on being poor/food insecure and nonpoor/food insecure, while disability has the largest marginal effect on being poor/food secure and nonpoor/food secure. These findings are robust across different definitions of poverty and different model specifications.

While consistent with previous studies on the determinants of food insecurity, our findings also contribute to the knowledge base by focusing on the relationship between poverty and food insecurity and identifying the important effect of health on these outcomes beyond contributing sociodemographic and economic factors. Moreover, the similarly strong relationship that poor health has with the likelihood of being poor and food insecure and the likelihood of being nonpoor and food insecure suggests that food insecurity may be even more strongly linked to poor health than it is to poverty.

There are some limitations to our study worth noting. First, our results should not be interpreted through a causal lens as they only indicate a correlation between these factors. This is particularly important in the context of the relationship between poverty, food insecurity, and health since it is likely bidirectional and any causal inference could be complicated by reverse causality. On one hand, adverse health outcomes might increase the risk of becoming poor and/or food insecure. On the other hand, being poor and/or food insecure might lead to adverse health outcomes. Our analysis is not aimed at examining the direction of these possible causal relationships.

Second, assessing food insecurity is challenging and no single approach can identify everyone who for various reasons reports being food insecure. Therefore, it is important to acknowledge that the use of additional tools developed specifically for older adults, such as the Council on Nutrition Appetite Questionnaire, can importantly supplement the existing general assessment tools by providing a more tailored assessment of older adults' appetite problems and history (Mikami et al. 2019; Wilson et al. 2005). Yet, most of these measurement tools have not been verifiably effective (Vilar-Compte et al. 2017). Additionally, there are degrees of food insecurity (e.g., very low food security in Coleman-Jensen et al. (2021)) that we cannot capture with our data but that may also explain the gap between poverty and food insecurity. The USDA Household Food Security Survey Module, which measures very low food security, can be an important resource. Moreover, a version of the 6-item module has been tested in an older adult population (Lee et al. 2011).

Conclusions

This paper aimed to disentangle the complex relationship of food insecurity and poverty. It finds a strong correlation between food insecurity and health that goes beyond the sociodemographic and economic factors related to poverty. There are, however, additional areas that research could explore to gain more insight into the nature of this relationship. For example, poor and food secure households stand out from other households. Not only are they economically more secure than those that are poor and food insecure, but poor health generally has a more tenuous effect on the likelihood that households will be poor and food secure and, unlike for other outcomes, disability is the strongest predictor. Future research could study these households more carefully. Nearly half of them are homeowners. Are they food secure because they have paid off their mortgages? Do they spend less on property taxes and home maintenance that those that are poor and food insecure? Are poor and food secure households on their way to becoming poor and food insecure?

Understanding the risk factors for poverty and food insecurity and the relationship between the two is important for nonprofits, food banks, and other community-based organizations that serve food insecure households. In the context of a rapidly aging population, an increasing number of older adults, even those not deemed poor, may be at risk of food insecurity. This may be further exacerbated by cohort effects, since we expect that

cohort-specific factors such as preference for continued independent living in old age, could further increase exposure to food insecurity among seniors, including nonpoor seniors. Policymakers may also benefit from this information as it will allow them to plan more accurately how much food-related assistance older adults may need today and in the future. Federal agencies, such as the U.S. Department of Agriculture Food and Nutrition Service, could use this information to identify the types of food assistance that people need. For example, those who are poor/food insecure need economic assistance such as SNAP, while those who are nonpoor/food insecure may need assistance accessing food (such as grocery or meal delivery). Finally, our findings about the importance of health status for the food security of older adults can help inform all food policy stakeholders about the need to consider health status together with economic well-being when determining older adults' risk of becoming food insecure.

References

Bartfield, Judith, and J. Michael Collins. 2017. "Food Insecurity, Financial Shocks, and Financial Coping Strategies among Households with Elementary School Children in Wisconsin." *Journal of Consumer Affairs* 51(3): 519–48.

Brewer, Dawn P., Christina S. Catlett, Katie N. Porter, Jung Sun Lee, Dorothy B. Hausman, Sudha Reddy, and Mary Ann Johnson. 2010. "Physical Limitations Contribute to Food Insecurity and the Food Insecurity–Obesity Paradox in Older Adults at Senior Centers in Georgia." *Journal of Nutrition for the Elderly* 29(2): 150-169.

Brucker Debra L., and Alisha Coleman-Jensen. 2017. "Food Insecurity Across the Adult Life Span for Persons with Disabilities." *Journal of Disability Policy Studies* 28(2): 109-118.

Brucker, Debra L. Sophie Mitra, Navena Chaitoo, and Joseph Mauro. 2015. "More Likely to be Poor Whatever the Measure: Working-Age Persons with Disabilities in the United States." *Social Science Quarterly* 96(1): 273-296.

Butrica, Barbara A., Stipica Mudrazija, and Jonathan Schwabish. 2021. "The Relationship between Disability Insurance Receipt and Food Insecurity." Chestnut Hill, MA: Center for Retirement Research at Boston College.

Coleman-Jensen, Alisha, and Mark Nord. 2013. *Food Insecurity Among Households with Working-Age Adults with Disabilities,* ERR-144, U.S. Department of Agriculture, Economic Research Service.

Coleman-Jensen, Alisha, Matthew P. Rabbitt, Christian A. Gregory, and Anita Singh. 2021. Household Food Security in the United States in 2020. Report ERR-298. Washington, DC: US Department of Agriculture, Economic Research Service.

Cubanski, Juliette, Wyatt Koma, Anthony Damico, and Tricia Neuman. 2018. "How Many Seniors Live in Poverty." *Issue Brief*. Washington, DC: Kaiser Family Foundation.

Feeding America. 2018. "Food Insecurity and Poverty in the United States: Findings from the USDA and U.S. Census Bureau." Available at: https://hungerandhealth.feedingamerica.org/wp-content/uploads/2018/10/Food-Insecurity-Poverty-Brief_2018.pdf.

Fitzpatrick, Katie, and Alisha Coleman-Jensen. 2014. "Food on the Fringe: Food Insecurity and the Use of Payday Loans." *Social Service Review* 88(4): 553–93.

Gettens, Jack and Alexis Henry. 2019. "Making Ends Meet: How Low-Income DI Beneficiaries Meet Their Needs." DRC Working Paper 2019-02. Mathematica.

Gregory, Christian, and Alisha Coleman-Jensen. 2013. "Do High Food Prices Increase Food Insecurity in the United States?" *Applied Economic Perspectives and Policy* 35: 679–707.

Gundersen, Craig, and Steven B. Garasky. 2012. "Financial Management Skills Are Associated with Food Insecurity in a Sample of Households with Children in the United States." *Journal of Nutrition* 142: 1865–70.

Gundersen, Craig, Brent Kreider, and John Pepper. 2011. "The Economics of Food Insecurity in the United States." *Applied Economic Perspectives and Policy* 33(3): 281-303.

Gundersen, Craig, and James P. Ziliak. 2018. "Food Insecurity Research in the United States: Where We Have Been and Where We Need to Go." *Applied Economic Perspectives and Policy* 40(1): 119–35.

Heflin, Colleen M., Claire E. Altman, and Laura L. Rodriguez. 2019. "Food Insecurity and Disability in the United States." *Disability and Health Journal* 12:220-226.

Jackson, Dylan B., Mariana Chilton, Kecia R. Johnson, and Michael G. Vaughn. 2019. "Adverse Childhood Experiences and Household Food Insecurity: Findings From the 2016 National Survey of Children's Health." *American Journal of Preventive Medicine* 57(5): 667–674.

Jih, Jane, Irena Stijacic-Cenzer, Hilary K. Seligman, W. John Boscardin, Tung T. Nguyen, and Christine S. Ritchie. 2018. "Chronic Disease Burden Predicts Food Insecurity Among Older Adults." *Public Health Nutrition* 21(9): 1737-1742.

Joint Center for Housing Studies of Harvard University. 2015. "America's Rental Housing: Expanding Options for Diverse and Growing Demand." Cambridge, MA: Joint Center for Housing Studies of Harvard University.

Lee, Jung Sun, Mary Ann Johnson, Arvine Brown, and Mark Nord. 2011. "Food Security of Older Adults Requesting Older Americans Act Nutrition Program in Georgia Can Be Validly Measured Using a Short Form of the U.S. Household Food Security Survey Module." *The Journal of Nutrition* 141(7): 1362-1368.

Li, Zhe, and Joseph Dalaker. 2019. "Poverty Among Americans Aged 65 and Older." Report no. R45791. Washington, DC: Congressional Research Service.

Loibl, Cazilia, Alec P. Rhodes, Stephanie Moulton, Donald Haurin, and Chrisse Edmunds. 2021. "Food Insecurity Among Older Adults in the U.S.: The Role of Mortgage Borrowing." *Applied Economic Perspectives and Policy* 2022:1-26.

Mikami, Yurie, Yutaka Watanabe, Ayako Edahiro, Keiko Motokawa, Maki Shirobe, Jun Yasuda, Masaharu Murakami, Kohji Murakami, Yu Taniguchi, Junichi Furuya, and Hirohiko Hirano. 2019. "Relationship Between Mortality and Council of Nutrition Appetite Questionnaire Scores in Japanese Nursing Home Residents." *Nutrition* 57:40–45.

Orshansky, Mollie. 1963. "Children of the Poor." *Social Security Bulletin* 26(7): 3–13.

Nord, Mark, and Linda Kantor. 2006. “Seasonal Variation in Food Insecurity Is Associated with Heating and Cooling Costs among Low-Income Elderly Americans.” *Journal of Nutrition* 136: 2939–44.

Schwartz, Naomi, Ron Buliung, and Kathi Wilson. 2019. “Disability and Food Access and Insecurity: A Scoping Review of the Literature.” *Health & Place* 57:107-121.

She, Peiyun and Gina A. Livermore. 2007. “Material Hardship, Poverty, and Disability Among Working-Age Adults.” *Social Science Quarterly* 88(4): 970–989.

Short, Kathleen and Thesia Garner. 2012. “The Supplemental Poverty Measure: A Joint Project Between the Census Bureau and the Bureau of Labor Statistics.” Presented to the Federal Economic Statistics Advisory Committee (FESAC), June 8, 2012.

Tarasuk V, Mitchell A, McLaren L, McIntyre L. 2013. “Chronic physical and mental health conditions among adults may increase vulnerability to household food insecurity.” *The Journal of Nutrition*. Nov;143(11):1785-93.

Vilar-Compte, Diana, Adrian Camacho-Ortiz, and Samuel Ponce-de-Leon. 2017. “Infection Control in Limited Resource Countries: Challenges and Priorities.” *Current Infectious Disease Reports* 19 (May 5): 20.

Wight, Vanessa, Neeraj Kaushal, Jane Waldfogel, and Irv Garfinkel. 2014. “Understanding the Link between Poverty and Food Insecurity among Children: Does the Definition of Poverty Matter?” *Journal of Child Poverty* 20(1): 1-20.

Wilson, Margaret-Mary G., David R. Thomas, Laurence Z. Rubenstein, John T. Chibnall, Stephanie Anderson, Amy Baxi, Marilyn R. Diebold, and John E. Morley. “Appetite Assessment: Simple Appetite Questionnaire Predicts Weight Loss in Community-Dwelling Adults and Nursing Home Residents.” *The American Journal of Clinical Nutrition* 82:1074–1081.

Wimer, Christopher, and Lucas Manfield. 2015. "Elderly Poverty in the United States in the 21st Century: Exploring the Role of Assets in the Supplemental Poverty Measure." Working Paper 2015-29. Boston, MA: Center for Retirement Research.

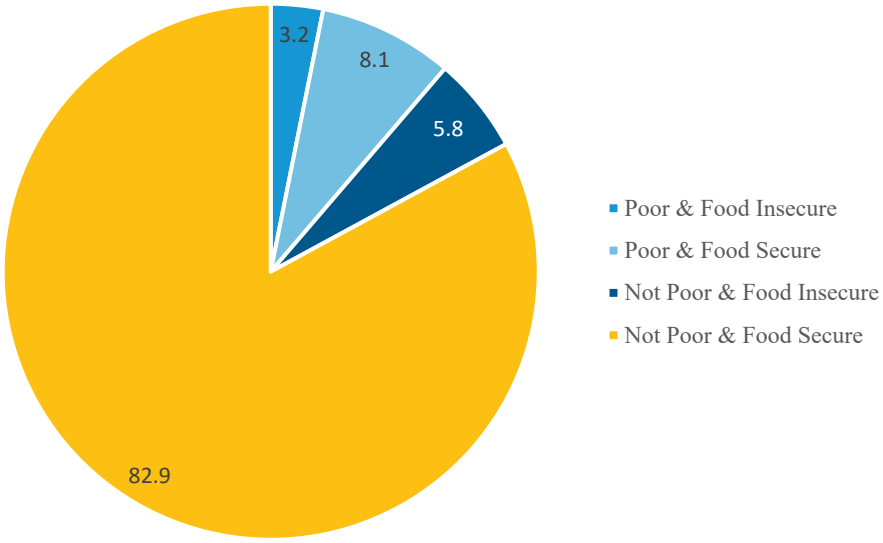
Wrigley, Neil. 2002. “’Food Deserts’ in British Cities: Policy Context and Research Priorities.” *Urban Studies* 39(11): 2029-2040.

Ziliak, James P., and Craig Gundersen. 2016. “Multigenerational Families and Food Insecurity.” *Southern Economics Journal* 82(4): 1147-1166.

Ziliak, James P., and Craig Gundersen. 2021. “The State of Senior Hunger in America in 2019: An Annual Report.” Chicago: Feeding America.

Figures and Tables

Figure 1. Poverty and Food Insecurity Among Households Ages 55 and Older in 2016 (%)



Source: Authors' analysis from the Health and Retirement Study.

Table 1. Sociodemographic Characteristics of Households Age 55 and Older in 2016, by Poverty and Food Insecurity (%)

	Poor & Food Insecure	Poor & Food Secure	Nonpoor & Food Insecure	Nonpoor & Food Secure
Age				
55-64	68.2^	51.5^#	58.5†#	41.6†
65-74	23.1	24.9	28.9†	33.6†
75-84	6.0^	14.7^#	10.1†#	17.5†
85+	2.6^	8.9^#	2.5†#	7.2†
Mean	63.3^	67.5^#	64.4†#	68.3†
Marital Status*Sex				
Single Women	54.3	52.1#	43.8†#	27.5†
Single Men	23.1	19.7	19.1†	14.6†
Married	22.6	28.3#	37.1†#	57.9†
Educational Attainment				
< HS	31.3	33.0#	18.1†#	7.2†
HS/GED	34.0	33.5	34.0†	26.6†
Some College	27.4^	21.1^#	30.0#	28.3
College	7.3	12.3#	17.9†#	37.9†
Race/Ethnicity				
Non-Hispanic White	41.5^	47.9^#	61.3†#	80.6†
Non-Hispanic Black	30.6^	23.7^#	20.7†#	8.6†
Hispanic	21.1^	24.5^#	10.5†#	6.8†
Asian/Native American/Other	6.7^	3.9^#	7.4†#	4.0†
Cohabiting	26.1	26.7	26.6†	21.1†
Observations	539	1,412	829	9,459

Source: Authors' analysis from the Health and Retirement Study.

Notes: ^indicates that t-tests of differences in means between poor/food insecure and poor/food secure are statistically significant at the $p < .05$ level; †indicates that t-tests of differences in means between nonpoor/food insecure and nonpoor/food secure are statistically significant at the $p < .05$ level; #indicates that t-tests of difference in means between poor/food secure and nonpoor/food insecure are statistically significant at the $p < .05$ level.

Table 2. Economic Characteristics of Households Age 55 and Older in 2016, by Poverty and Food Insecurity

	Poor & Food Insecure	**Poor & Food Secure**	**Nonpoor & Food Insecure**	**Nonpoor & Food Secure**
Work (%)	26.0	28.2[#]	42.0[†#]	54.6[†]
Homeowner (%)	34.4[^]	48.4[^]	47.7[†]	81.0[†]
Household Income (mean)	$10,110	$9,821[#]	$55,952[†#]	$117,550[†]
Household Income (median)	$10,244	$10,161	$34,869	$72,839
Income to Poverty Ratio (mean)	0.58	0.58[#]	3.08[†#]	6.87[†]
Income to Poverty Ratio (median)	0.71	0.67	2.03	4.33
Household Financial Assets (mean)	-$6,732	$21,185	$5,023[†]	$215,751[†]
Household Financial Assets (median)	$0	$0	$0	$16,379
Observations	539	1,412	829	9,459

Source: Authors' analysis from the Health and Retirement Study.

Notes: ^indicates that t-tests of differences in means between poor/food insecure and poor/food secure are statistically significant at the $p < .05$ level; †indicates that t-tests of differences in means between nonpoor/food insecure and nonpoor/food secure are statistically significant at the $p < .05$ level; #indicates that t-tests of difference in means between poor/food secure and nonpoor/food insecure are statistically significant at the $p < .05$ level.

Table 3. Health Characteristics of Households Age 55 and Older in 2016, by Poverty and Food Insecurity (%)

	Poor & Food Insecure	Poor & Food Secure	Nonpoor & Food Insecure	Nonpoor & Food Secure
Self-Rated Fair/Poor Health	65.7^	49.5^#	59.7†#	27.6†
4+ Health Conditions	44.4^	30.6^#	38.0†#	22.4†
Disability	18.6^	7.8^	8.9†	1.5†
Any Mental Health Issues	72.6^	48.7^#	62.1†#	33.2†
Memory Issues	10.5^	5.4^	5.6†	2.7†
Any ADLs or IADLs	42.3^	25.2^	27.1†	11.2†
Observations	539	1,412	829	9,459

Source: Authors' analysis from the Health and Retirement Study.

Notes: ^indicates that t-tests of differences in means between poor/food insecure and poor/food secure are statistically significant at the $p < .01$ level; †indicates that t-tests of differences in means between nonpoor/food insecure and nonpoor/food secure are statistically significant at the $p < .01$ level; #indicates that t-tests of difference in means between poor/food secure and nonpoor/food insecure are statistically significant at the $p < .01$ level.

Table 4. Marginal Effects from Multinomial Regressions of the Likelihood of Poverty and Food Insecurity

	Poor & Food Insecure	Poor & Food Secure	Nonpoor & Food Insecure	Nonpoor & Food Secure
Age 65-74	-0.0251**	-0.0556**	-0.0162**	0.0969**
	(0.0019)	(0.0032)	(0.0023)	(0.0038)
Age 75-84	-0.0366**	-0.0650**	-0.0330**	0.1346**
	(0.0020)	(0.0036)	(0.0025)	(0.0043)
Age 85+	-0.0419**	-0.0505**	-0.0477**	0.1400**
	(0.0021)	(0.0045)	(0.0026)	(0.0051)
Single Women	0.0202**	0.0476**	0.0179**	-0.0856**
	(0.0016)	(0.0028)	(0.0023)	(0.0036)
Single Men	0.0080**	0.0315**	0.0033	-0.0428**
	(0.0019)	(0.0035)	(0.0026)	(0.0044)
HS/GED	-0.0123**	-0.0661**	0.0029	0.0755**
	(0.0021)	(0.0042)	(0.0026)	(0.0050)
Some College	-0.0181**	-0.0870**	0.0021	0.1029**
	(0.0021)	(0.0042)	(0.0028)	(0.0052)
College	-0.0258**	-0.1015**	-0.0035	0.1308**
	(0.0024)	(0.0044)	(0.0032)	(0.0056)
Non-Hispanic Black	0.0209**	0.0608**	0.0114**	-0.0931**
	(0.0019)	(0.0035)	(0.0026)	(0.0045)
Hispanic	0.0169**	0.0889**	-0.0084**	-0.0973**
	(0.0021)	(0.0048)	(0.0025)	(0.0056)
Asian/Native American/Other	0.0109**	0.0470**	0.0172**	-0.0750**
	(0.0039)	(0.0080)	(0.0059)	(0.0096)
Cohabiting	-0.0039**	-0.0226**	0.0009	0.0256**
	(0.0014)	(0.0026)	(0.0019)	(0.0031)
Working	-0.0258**	-0.0850**	0.0006	0.1103**
	(0.0017)	(0.0030)	(0.0020)	(0.0035)
Homeowner	-0.0140**	-0.0274**	-0.0160**	0.0574**
	(0.0015)	(0.0025)	(0.0019)	(0.0031)
Household Financial Assets	-0.0016**	-0.0014**	-0.0030**	0.0060**
	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Fair/Poor Health	0.0118**	0.0146**	0.0135**	-0.0399**
	(0.0015)	(0.0023)	(0.0018)	(0.0028)
4+ Health Conditions	0.0054**	-0.0064**	0.0116**	-0.0106**
	(0.0015)	(0.0028)	(0.0020)	(0.0034)
Disability	0.0122**	0.0274**	0.0119**	-0.0515**
	(0.0018)	(0.0041)	(0.0029)	(0.0052)
Any Mental Health Issues	0.0151**	-0.0001	0.0195**	-0.0345**
	(0.0014)	(0.0022)	(0.0018)	(0.0027)
Memory Issues	0.0056**	-0.0040	0.0048	-0.0063
	(0.0027)	(0.0047)	(0.0036)	(0.0058)
Any ADLs or IADLs	0.0119**	0.0021	0.0188**	-0.0328**
	(0.0015)	(0.0027)	(0.0020)	(0.0033)
Pseudo R-squared		0.2197		

Source: Authors' analysis from the Health and Retirement Study.

Notes: There are 105,022 household-year observations. Regressions also include a flag for missing mental health issues and year dummies, and are estimated with robust standard errors (shown in parentheses) clustered by household. *$p < .05$; **$p < .01$.

Table 5. Relative Risk Ratios from Multinomial Regressions of the Likelihood of Poverty and Food Insecurity (Base Category is Nonpoor & Food Secure)

	Poor & Food Insecure	**Poor & Food Secure**	**Nonpoor & Food Insecure**
Age 65-74	0.34**	0.43**	0.58**
	(0.02)	(0.02)	(0.02)
Age 75-84	0.17**	0.34**	0.36**
	(0.01)	(0.02)	(0.02)
Age 85+	0.11**	0.40**	0.22**
	(0.01)	(0.02)	(0.02)
Single Women	2.94**	2.22**	1.80**
	(0.19)	(0.09)	(0.08)
Single Men	1.69**	1.67**	1.22**
	(0.14)	(0.08)	(0.07)
HS/GED	0.52**	0.46**	0.85**
	(0.04)	(0.02)	(0.05)
Some College	0.37**	0.33**	0.77**
	(0.03)	(0.02)	(0.05)
College	0.23**	0.24**	0.63**
	(0.03)	(0.01)	(0.04)
Non-Hispanic Black	2.93**	2.48**	1.60**
	(0.20)	(0.10)	(0.08)
Hispanic	2.66**	3.05**	1.10
	(0.22)	(0.15)	(0.07)
Asian/Native American/Other	2.06**	2.08**	1.64**
	(0.31)	(0.19)	(0.17)
Cohabiting	0.78**	0.72**	0.94
	(0.04)	(0.03)	(0.04)
Working	0.25**	0.28**	0.71**
	(0.02)	(0.01)	(0.03)
Homeowner	0.48**	0.61**	0.61**
	(0.03)	(0.02)	(0.02)
Household Financial Assets	0.92**	0.97**	0.93**
	(0.00)	(0.00)	(0.00)
Fair/Poor Health	1.79**	1.34**	1.47**
	(0.10)	(0.04)	(0.06)
4+ Health Conditions	1.26**	0.97	1.29**
	(0.07)	(0.04)	(0.06)
Disability	1.92**	1.59**	1.48**
	(0.14)	(0.09)	(0.09)
Any Mental Health Issues	1.95**	1.13**	1.63**
	(0.10)	(0.03)	(0.06)
Memory Issues	1.24*	0.98	1.12
	(0.13)	(0.06)	(0.09)
Any ADLs or IADLs	1.73**	1.15**	1.59**
	(0.10)	(0.04)	(0.07)
Pseudo R-squared		0.2197	

Source: Authors' analysis from the Health and Retirement Study.

Notes: There are 105,022 household-year observations. Regressions also include a flag for missing mental health issues and year dummies, and are estimated with robust standard errors (shown in parentheses) clustered by household. *$p < .05$; **$p < .01$.

Table 6. Relative Risk Ratios from Multinomial Regressions of the Likelihood of Poverty and Food Insecurity (Base Category is Nonpoor & Food Secure)

	Poor & Food Insecure	Poor & Food Secure	Nonpoor & Food Insecure	Poor & Food Insecure	Poor & Food Secure	Nonpoor & Food Insecure
	Panel A – Official Poverty			**Panel B – 75% Official Poverty**		
Fair/Poor Health	1.79**^†	1.34**^#	1.47**#†	1.69**^†	1.31**^#	1.49**#†
	(0.10)	(0.04)	(0.06)	(0.11)	(0.05)	(0.05)
4+ Health Conditions	1.26**^	0.97^#	1.29**#	1.13^†	0.91*^#	1.31**#†
	(0.07)	(0.04)	(0.06)	(0.08)	(0.04)	(0.05)
Disability	1.92**^†	1.59**^	1.48**†	1.88**^†	1.51**^	1.41**†
	(0.14)	(0.09)	(0.09)	(0.15)	(0.10)	(0.08)
Any Mental Health Issues	1.95**^†	1.13**^#	1.63**#†	1.94**^†	1.14**^#	1.66**#†
	(0.10)	(0.03)	(0.06)	(0.12)	(0.04)	(0.06)
Memory Issues	1.24*^	0.98^	1.12	1.41**^	1.01^	1.11
	(0.13)	(0.06)	(0.09)	(0.17)	(0.08)	(0.08)
Any ADLs or IADLs	1.73**^	1.15**^#	1.59**#	1.73**^	1.13**^#	1.58**#
	(0.10)	(0.04)	(0.07)	(0.11)	(0.05)	(0.06)
Pseudo R-squared		0.2197			0.2063	
	Panel C – 125% Official Poverty			**Panel D – Supplemental Poverty**		
Fair/Poor Health	1.86**^†	1.41**^	1.47**†	1.88**^†	1.40**^	1.45**†
	(0.09)	(0.04)	(0.06)	(0.09)	(0.04)	(0.06)
4+ Health Conditions	1.23**^	0.94^#	1.29**#	1.27**^	1.02^#	1.32**#
	(0.07)	(0.03)	(0.06)	(0.07)	(0.03)	(0.06)
Disability	2.01**^†	1.65**^	1.47**†	1.72**^	1.41**^	1.49**
	(0.14)	(0.09)	(0.11)	(0.12)	(0.07)	(0.10)
Any Mental Health Issues	2.03**^†	1.15**^#	1.57**#†	1.98**^†	1.19**^#	1.63**#†
	(0.10)	(0.03)	(0.06)	(0.09)	(0.03)	(0.06)
Memory Issues	1.23*^	1.00^	1.12	1.34**	1.12*	1.14
	(0.11)	(0.06)	(0.09)	(0.13)	(0.06)	(0.09)
Any ADLs or IADLs	1.73**^	1.12**^#	1.57**#	1.69**^	1.21**^#	1.67**#
	(0.09)	(0.04)	(0.07)	(0.09)	(0.04)	(0.07)
Pseudo R-squared		0.2256			0.1742	

Source: Authors' analysis from the Health and Retirement Study.

Notes: There are 105,022 household-year observations. Regressions also include age, marital status*sex, educational attainment, race and ethnicity, cohabiting, work, homeownership, financial assets, a flag for missing mental health issues, and year dummies, and are estimated with robust standard errors (shown in parentheses) clustered by household. *$p < .05$; **$p < .01$

^indicates that t-tests of differences in coefficients between poor/food insecure and poor/food secure are statistically significant at the $p < .01$ level; †indicates that t-tests of differences in coefficients between poor/food insecure and nonpoor/food insecure are statistically significant at the $p < .01$ level; #indicates that t-tests of difference in coefficients between poor/food secure and nonpoor/food insecure are statistically significant at the $p < .01$ level.

Table 7. Marginal Effects from Logistic Regression of the Likelihood of Worsening Poverty and/or Food Security

Age 65-74	-0.0411**
	(0.0030)
Age 75-84	-0.0503**
	(0.0032)
Age 85+	-0.0444**
	(0.0039)
Single Women	0.0257**
	(0.0023)
Single Men	0.0161**
	(0.0032)
HS/GED	-0.0266**
	(0.0030)
Some College	-0.0425**
	(0.0032)
College	-0.0550**
	(0.0035)
Non-Hispanic Black	0.0379**
	(0.0028)
Hispanic	0.0474**
	(0.0035)
Asian/Native American/Other	0.0409**
	(0.0067)
Cohabiting	0.0048**
	(0.0022)
Working	-0.0467**
	(0.0026)
Homeowner	-0.0177**
	(0.0022)
Household Financial Assets	-0.0034**
	(0.0001)
Fair/Poor Health	0.0065**
	(0.0031)
4+ Health Conditions	0.0074*
	(0.0042)
Disability	0.0220**
	(0.0059)
Any Mental Health Issues	0.0019
	(0.0030)
Memory Issues	0.0132**
	(0.0065)
Any ADLs or IADLs	0.0151**
	(0.0034)
Pseudo R-squared	0.1025

Source: Authors' analysis from the Health and Retirement Study.
Notes: There are 77,272 household-year observations. Regressions also include a flag for missing mental health issues and year dummies, and are estimated with robust standard errors (shown in parentheses) clustered by household. *$p < .10$; **$p < .05$; ***$p < .01$.