UNIVERSITY OF KENTUCKY
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A Portrait of Food Insecurity in Multigenerational Households: Part 1

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Executive Summary

The number of older Americans experiencing food insecurity remains stubbornly high. Of particular concern are the exceptionally high rates among grandparents raising grandchildren. This concern it is likely to be exacerbated in coming years owing to the increasing percentage of children born out of wedlock, and the increasing fraction of grandparents living in single-parent families. In this report provide a broad portrait of the extent and distribution of food insecurity in multigenerational households. We use data from the 2001-2010 December Supplements of the Current Population Survey (CPS) to compare food insecurity in adult households age 40 and older with and without grandchildren present over time, across detailed economic and demographic characteristics of these households, and across states and major Metropolitan Statistical Areas. We also examine the key socioeconomic determinants of food insecurity in order to identify whether food security disadvantage that multigenerational households face relative to households with no grandchildren present holds after we control for income and other factors. Knowledge of whether differences exist will inform policymakers, program administrators, and non-profit organizations of whether potential avenues for intervention to alleviate hunger risk need to be catered to different family structures.

In a typical year about 4.2 percent of adult households have a grandchild living in the home. Of those, about 75% are made up of three generations (grandparent, adult child, and grandchild) and the other 25% are households with only the grandparent and grandchild present. There are important demographic differences between multigenerational households and those households with no grandchild present. Households with grandchildren are more likely to be poor, to be African American, to be Hispanic, to live in a metro area, to live in the South, to be younger, and to be a high school dropout. Overall, the percentage of multigenerational households increased by 19% last decade, with the fastest growth among those households headed by an adult with some college education (though the rate is at least 3 times higher among high school dropouts), and after falling in the early part of the decade, during the Great Recession the fraction of multigenerational African American households increased nearly 30%.

Our key findings are that rates of food insecurity in households with a grandchild present are generally at least 2 times higher in a typical year than households with no grandchildren. Specifically, if no grandchild is present the average rates marginal food insecurity, food insecurity, and very low food security, across the decade were 14.9, 8.5, and 3.1 percent, respectively, while with a grandchild present the corresponding rates are 32.5, 19.2, and 5.6 percent. Over the past decade 40 percent more adults age 40 and older were marginally food insecure, 48 percent more were food insecure, and an astonishing 67 percent more were very low food secure. After a staggering increase in very low food security of 125% between 2007 and 2008 in households with grandchildren, the rates fell during the recession perhaps in response to expansions in the Supplemental Nutrition Assistance Program (SNAP) as part of the American Recovery Act of 2009. However, very low food security in households with grandchildren in 2010 was still 53 percent higher than in 2007. The level and trend of food hardship facing adult households poses a serious public policy challenge, and multigenerational households are at even greater risk.

In our multivariate regression analyses we find some important distinctions between households without a grandchild present and those with a grandchild present. First, when there are grandchildren living in the household there is no evidence of a declining age gradient in risk of food insecurity. This was a prominent result of Ziliak et al. (2008) and Ziliak and Gundersen (2009) studies, and which holds in the sample with no grandchildren present. Second, the "disadvantage" of certain demographic characteristics is less when a grandchild is present. For example, being an African American increases the probability of marginal food insecurity by over 40 percent from the baseline mean for households with no grandchildren present, but this effect is just 16 percent when grandchildren are present. Third, the "advantage" of certain economic factors is more prevalent among households with grandchildren, most notable of these is the strong protective effect of having incomes above the poverty line and especially over twice the line. Even still, simulations of our model show that a hypothetical senior (defined as a senior who is white, retired, married, living in a metropolitan region, over the age of 80, and college educated) with a grandchild living in the home and family income above twice the poverty line is at equal or greater risk of food insecurity than a similar senior with no grandchild in the household but whose income is below half the poverty line.

We conclude with two suggestions for policies regarding how to address the challenge of food insecurity among households with both grandparents and grandchildren present. First, we stress the importance of the Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp Program) in alleviating food insecurity across the lifespan. Insofar as this is the only program that is targeted towards both seniors and children, encouraging participation for grandparents raising grandchildren is especially important, especially in light of the low participation rates among some segments of the population. Second, reauthorization of the Older Americans Act is slated for this Congress and the scale of food insecurity identified in this report suggests that enhanced funding is needed to support outreach and direct services to these vulnerable senior households.

I. Introduction

The population of the United States is aging, and as documented in Ziliak, Gundersen, and Haist (2008), the number of older Americans experiencing food insecurity is forecasted to grow as the main cohort of the "Baby Boom" generation reaches retirement. Additionally, the threat of hunger in households with seniors is likely to be exacerbated in coming years owing to the increasing percentage of children born out of wedlock, and the increasing fraction of grandparents living in single-parent families. Cancian and Reed (2009) document that from 1980 to 2006 the fraction of children born to unwed mothers rose from about 15 percent of live births to nearly 40 percent, and during this period the fraction of single mother families with a grandparent present rose from just over 10 percent to about 20 percent. Moreover, a recent report by the Pew Research Center showed that in 2008 about 6.6 million households contained at least three generations of family members, which is a sharp 30 percent increase since the start of the decade.[1] Assuming these trends continue, or at least do not reverse, then food insecurity in multi-generation households is likely to be an increasing public policy concern in coming years.

In this Part I of our report we provide a broad portrait of the extent and distribution of food insecurity in multigenerational households, and in Part II we examine the attendant health consequences of food insecurity for these families. Our analysis utilizes data from the Current Population Survey (CPS) where we compare food insecurity in adult households with and without grandchildren present over time, across detailed economic and demographic characteristics of these households, and across states and major Metropolitan Statistical Areas. This portrait expands upon our earlier research to compare the extent of food insecurity among households with and without grandchildren present. It is perhaps surprising that no prior study

[1] http://pewsocialtrends.org/assets/pdf/752-multi-generational-families.pdf

has documented these basic trends, even though it is fundamental to an informed national policy discussion on a particularly vulnerable population.

We next examine the socioeconomic determinants of food insecurity. The objective of this section is twofold. First, we want to identify the magnitude of food security disadvantage that multigenerational households face relative to adult households with no grandchildren present after we control for income and other factors. Second, we want to identify whether the determining factors of food insecurity differ in a substantive way between multigenerational households and households with no grandchild present. For example, in our earlier research we found that relatively young seniors (i.e. between ages 60 and 70), those with low education attainment, and African-Americans, each had substantially greater risk of hunger than older seniors, highly educated, and whites, respectively, even controlling for income. In this section we will test whether or not this pattern holds for multi-generation families as it does for the population of seniors overall. Knowledge of whether differences exist will inform policymakers and non-profit organizations of whether potential avenues for intervention to alleviate hunger risk need to be catered to different family structures.

In our analyses, we utilize two characterizations of food insecurity, the first being a simple yes/no indicator of whether the family experiences one of three measures of food insecurity and the second being a measure of the depth of food insecurity. The first set of measures tells us how the various factors determine the prevalence of hunger risk, whereas the second measure, which gives greater weight to those families experiencing more extreme forms of hunger risk, tells us how the various factors affect the severity of hunger (Gundersen 2008). Within the first characterization we consider three measures of food need that capture increasing

degrees of hardship: marginal food insecurity, food insecurity, and very low food security, while for the severity index we focus on food insecurity.

II. The Extent and Distribution of Food Insecurity in Multigenerational Households

To document the extent and distribution of food insecurity in multigenerational households we use data from the Current Population Survey (CPS) spanning the 2001 through 2010 calendar years. The CPS is a nationally representative survey conducted by the Census Bureau for the Bureau of Labor Statistics, providing employment, income and poverty statistics. In December of each year, 50,000 households respond to a series of 18 questions (10 if there are no children present) that make up the Core Food Security Module (CFSM), in addition to questions about food spending and the use of government and community food assistance programs. Households are selected to be representative of civilian households at the state and national levels, and thus do not include information on individuals living in group quarters including nursing homes or assisted living facilities. The CFSM in the CPS is the official data employed by the U.S. Department of Agriculture to estimate food insecurity rates annually in the general population. In general, a household is observed in two successive years in the CPS. Since multiple years are being pooled together for much of our analysis, to ensure that no household is included more than once, the sample includes households observed for the second time in 2001 through 2010. Excluding households with heads younger than 40, the pooled sample includes 263,790 households between the ages of 40 and 90. Note for our purposes here the reference group for multigenerational households is households headed by an adult caretaker age 40 and older. For brevity, our use of the term adult will refer to those 40 and older unless noted otherwise.

Table 1 contains weighted averages of selected characteristics for the whole sample and by presence of grandchildren. The weight used in all analyses is the supplemental person weight provided in the December CPS survey and is used to adjust the averages to reflect the whole population age 40 and over. Among all adults, about 8 percent are poor and 14 percent have incomes between 100 and 200% of the poverty line. The majority, though, have incomes above 200% of the poverty line. Most adults are white, married, a homeowner, live in a metro area, are employed or retired, and have a high school diploma or more.

Table 1. Selected Characteristics of Adults Age 40+ in the Current Population Survey, 2001-2010

	All	No Grandchildren Present	Grandchildren Present
Income Categories			
Below 50% of the Poverty Line	2.30	2.15	5.57*
Between 50% and 100% of the Poverty Line	5.92	5.64	12.17*
Between 100% and 200% of the Poverty Line	14.22	13.79	23.96*
Above 200% of the Poverty Line	56.61	57.56	35.00*
Missing Income	20.95	20.84	23.31*
Racial Categories			
White	83.81	84.42	69.96*
African American	10.76	10.20	23.33*
Other	5.43	5.38	6.71*
Hispanic Ethnicity	9.24	8.83	18.59*
Marital Status			
Married	65.42	65.70	59.13*
Widowed	10.45	10.30	13.79*
Divorced or Separated	15.38	15.21	19.26*
Never Married	8.74	8.78	7.83*
Homeowner	81.48	81.58	79.21*
Geographic Location			
Non-Metro	18.76	18.74	19.08
Northeast	19.39	19.56	15.58*
Midwest	22.64	22.87	17.38*
South	36.10	35.74	44.24*
West	21.88	21.83	22.80*
Age			
40 to 44	16.65	16.82	12.74*

45 to49	16.83	16.86	16.25
50 to 54	15.40	15.38	15.89
55 to 59	13.17	13.06	15.64*
60 to 64	10.51	10.38	13.42*
65 to 69	8.09	8.01	9.75*
70 to 74	6.53	6.52	6.76
75 to 79	5.68	5.72	4.92*
80 and older	7.14	7.26	4.63*
Employment Status			
Employed	57.05	57.37	49.81*
Unemployed	2.87	2.84	3.50*
Retired	26.97	27.07	24.69*
Disabled	13.09	12.70	21.99*
Education Level			
Less Than High School	14.75	14.14	28.55*
High School Diploma	32.33	32.10	37.65*
Some College	25.39	25.50	22.81*
College Degree	27.53	28.26	10.99*
Food Stamp Recipient	4.49	3.96	16.53*
Grandchild or Parent Present			
No Grandchild or Parent	95.78	100.00	0.00[a]
Grandchild and Parent	3.10	0.00	73.34*
Grandchild Only	1.13	0.00	26.66*
Female	52.92	52.56	61.13*
Living Alone	17.99	18.79	0.00 [a]
Marginal Food Insecure	15.69	14.96	32.46*
Food Insecure	8.93	8.48	19.18*
Very Low Food Secure	3.18	3.07	5.55*

* Denotes the difference in means between samples with and without grandchildren are statistically different from zero at the 5% level. There are 263,790 observations (10,338 with grandchild present; 253,452 without). [a] Denotes no basis for comparison.

In a typical year about 4.2 percent of adult households have a grandchild living in the home. Of those, about three-fourths are made up of three generations (grandparent, adult child, and grandchild) and the other fourth are households with only the grandparent and grandchild present. A comparison of columns (2) and (3) Table 1 shows that there are substantive differences in the demographics of adult households without and with grandchildren present, and with few exceptions, these differences are statistically significant at the 5 percent level. For

example, of those reporting incomes, 55 percent of households with a grandchild live below 200% of the poverty line compared to 27 percent with no grandchild present. Households with grandchildren are more likely to be African American, to be Hispanic, to live in the South, to be ages 55-65, to be a high school dropout, to be disabled or otherwise out of the labor force, to receive food stamps, and to have a woman as survey respondent.

Figure 1. Percent of Householders Age 40+ with Grandchildren Present by Race

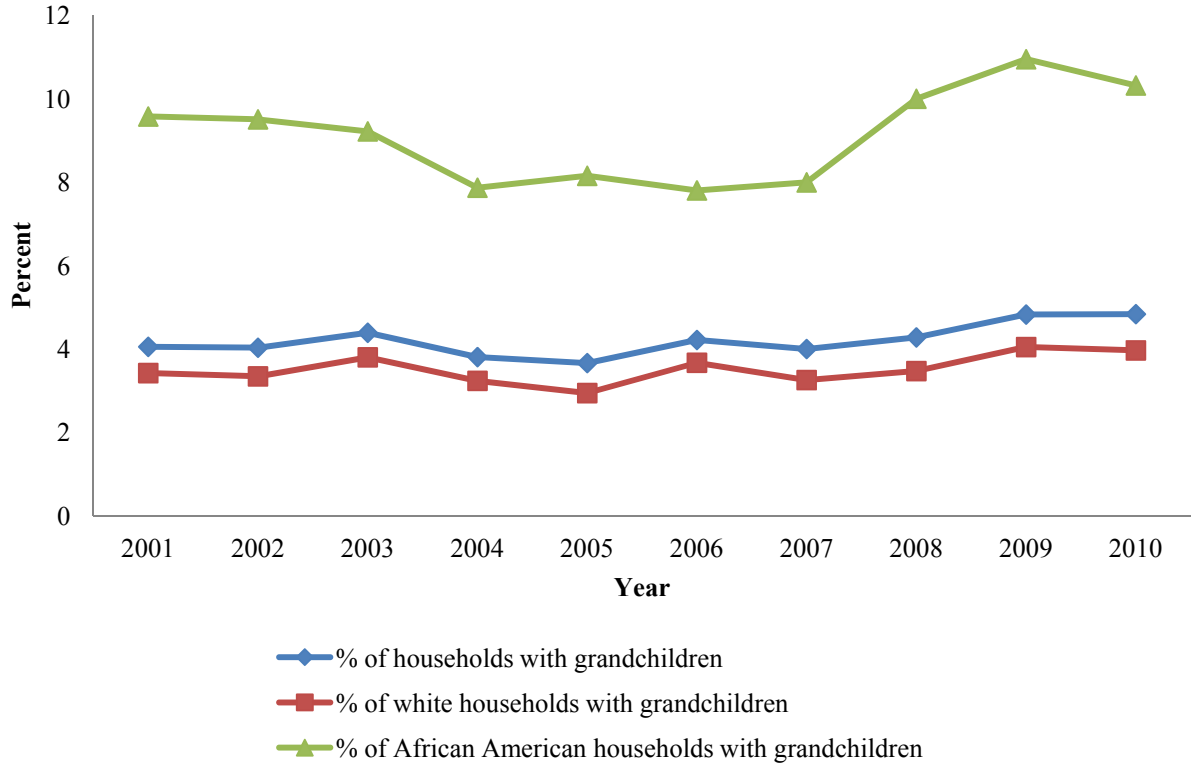
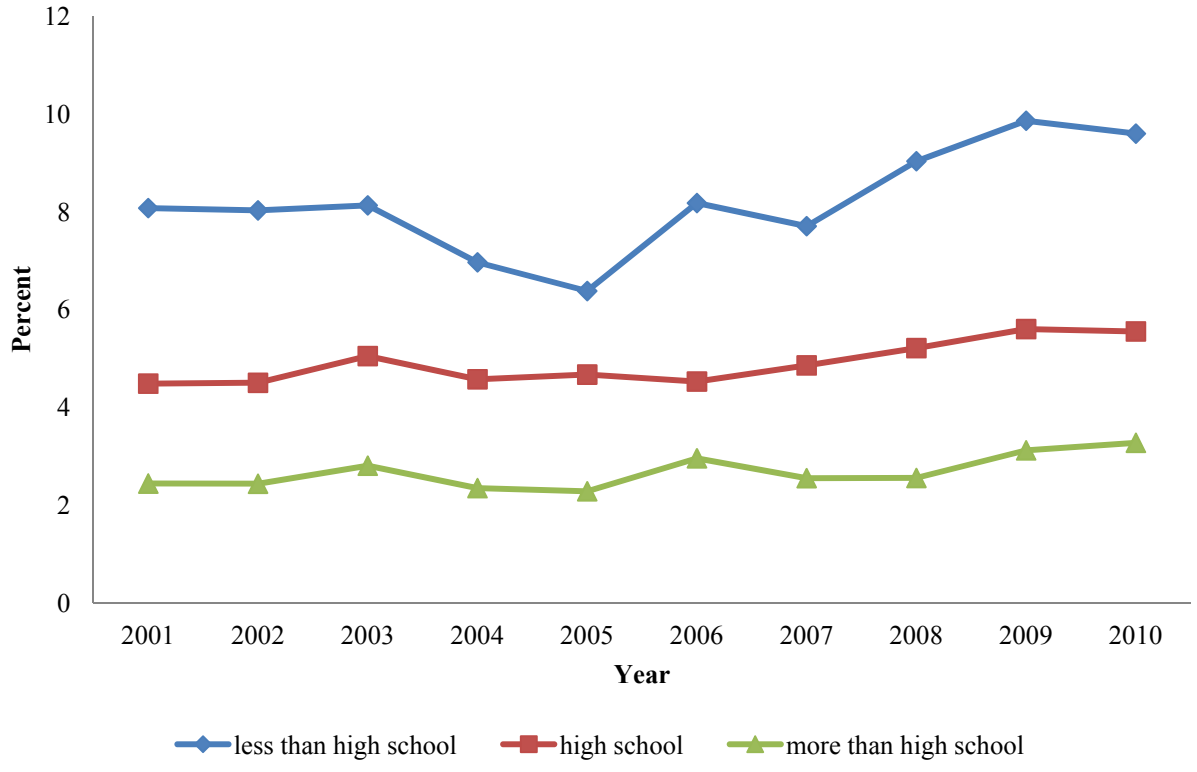


Figure 1 depicts trends in the fraction of households headed by an adult with a grandchild present overall and by race. Figure 1 shows that there has been secular growth of about 19% in the fraction of multigenerational households from 4.05% in 2001 to 4.84% in 2010. There is a significant racial gap in the percent of households with a grandchild in that African American households are 2-3 times more likely to have a grandchild present than whites. Moreover, after

falling in the early part of the decade, there has been a strong upward trend since the start of the Great Recession in 2007 in African American multigenerational households (an increase of nearly 30% from 2007 to 2010; the corresponding increase was 22% among white households). Figure 2 demonstrates that in any given year the percentage of adult households with grandchildren present are more likely to be headed by someone with less than a high school degree. However, over the past decade the growth in multigenerational families has been fastest among adult heads with more than high school (34% compared to 18% for drop outs), and this was also true in the recession where there was an increase of 28% from 2007-2010 in multigenerational households among those with some college or more compared to 25% among those who did not graduate from high school.

Figure 2. Percentage of Householders Age 40+ with Grandchildren Present by Education



A. National Trends in Food Insecurity

We begin our analysis of the extent and distribution of food insecurity by defining our measure of food insecurity and detailing who among adult Americans is considered food insecure and/or suffering from hunger. A household is said to be food secure if all household members had enough food at all times for an active, healthy life (Nord et al., 2010). In contrast, a household is said to be food insecure if it, at times, was uncertain of having, or unable to acquire, enough food for all household members because they had insufficient money and other resources for food.

Food insecurity is measured along a continuum by using survey responses to the Core Food Security Module (CFSM) in the Current Population Survey. To calculate the official food insecurity rates in the U.S. for families with children (defined over a 12 month period) the CFSM poses a series of 18 questions (10 questions if no children are present). Each question is designed to capture some aspect of food insecurity and, for some questions, the frequency with which it manifests itself. Examples of questions include: "I worried whether our food would run out before we got money to buy more," (the least severe item), "Did you or the other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food," "Did you ever lose weight because there wasn't enough money for food," and "Did you ever not eat for a full day three or more times" (the most severe item). A full set of questions can be found in Appendix Table 1.

For our baseline models we consider three characterizations of food insecurity: *marginally food insecure*, *food insecure*, and *very low food secure*. To be considered marginally food insecure means the respondent answers affirmatively to at least one question, to be food insecure means the respondent answers affirmatively to at least 3 questions on the CFSM, and to

be very low food secure means that the respondent answers affirmatively to at least 8 questions in households with children and 6 questions in households without children.

Figure 3. Food Insecurity among Adults Age 40+

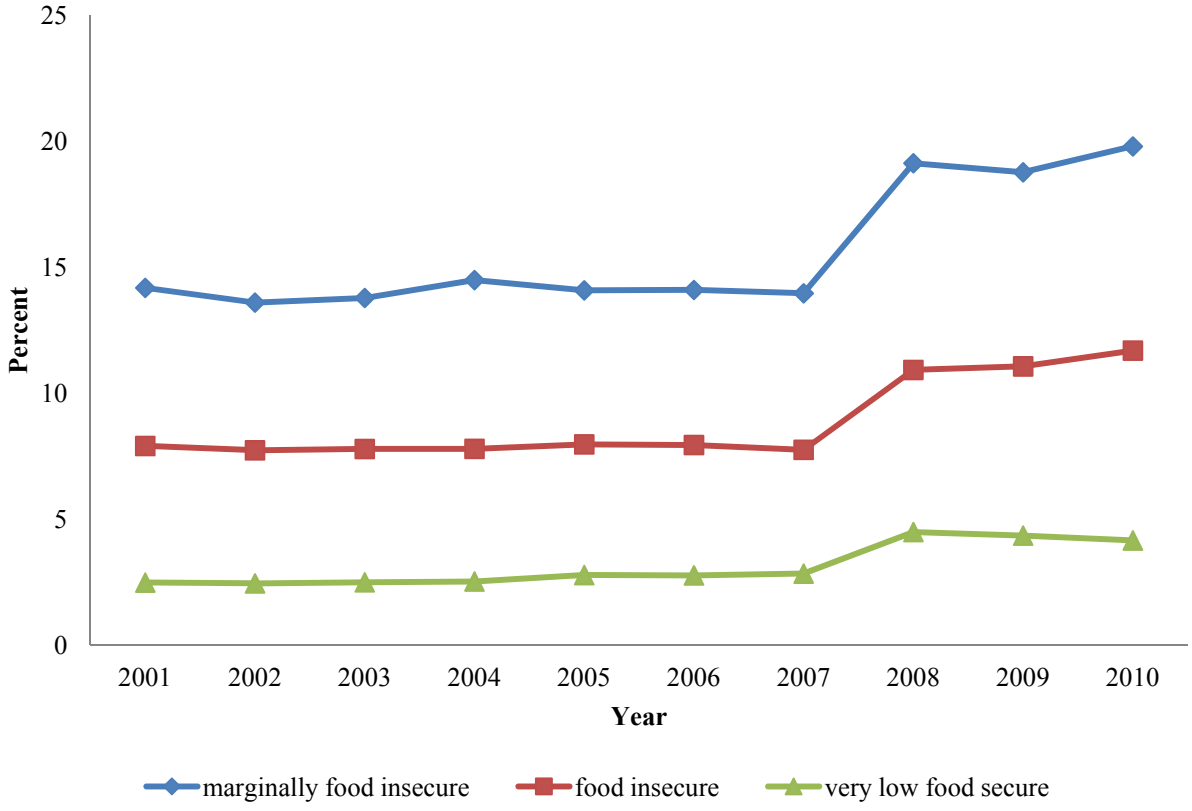
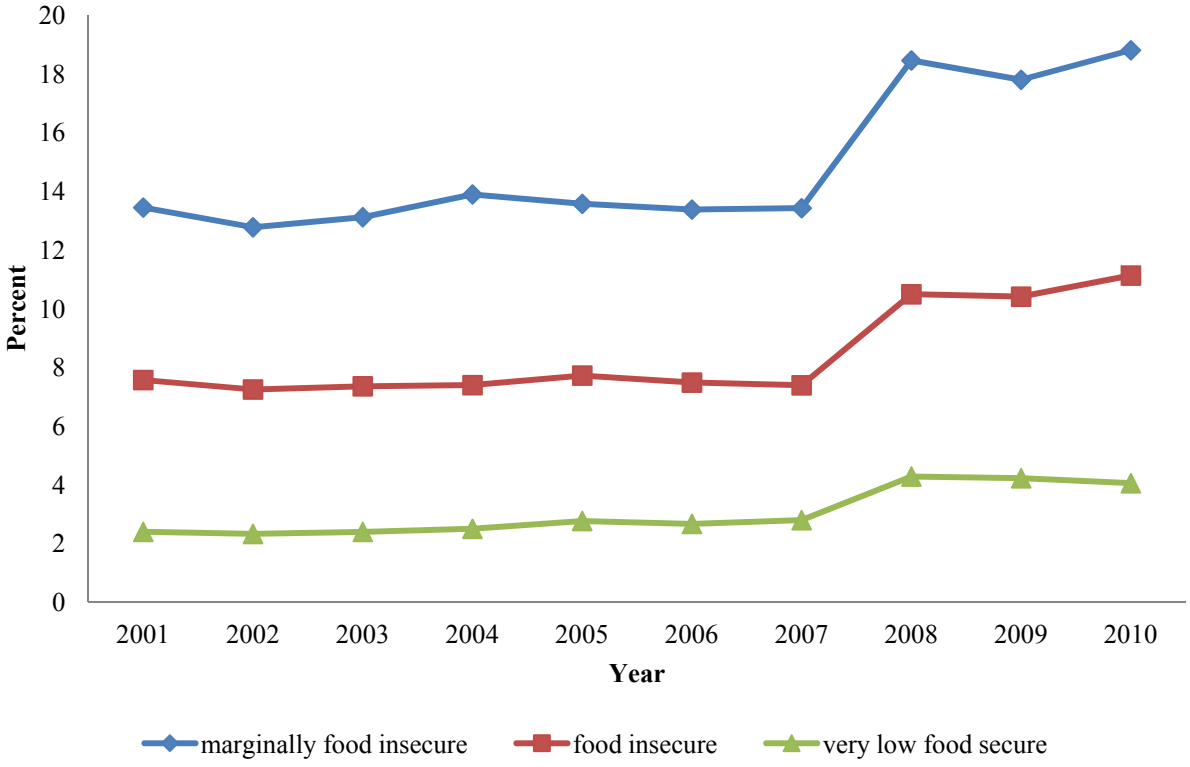


Figure 3 depicts trends in food insecurity rates from 2001 to 2010 for all adults age 40 and older in the United States. As seen in the last three rows of Table 1, on average 15.7 percent are marginally food insecure, 8.9 percent are food insecure, and 3.2 percent are very low food secure. The rates were fairly stable throughout the first half of the decade and then increased dramatically between 2007 and 2008 to 19.1, 10.9, and 4.5 percent, respectively. By the end of the decade, 40 percent more adults 40 and older were marginally food insecure, 48 percent more were food insecure, and an astonishing 67 percent more were very low food secure.[2]

[2] Ziliak and Gundersen (2012) show a similar pattern for the 60 and older population.

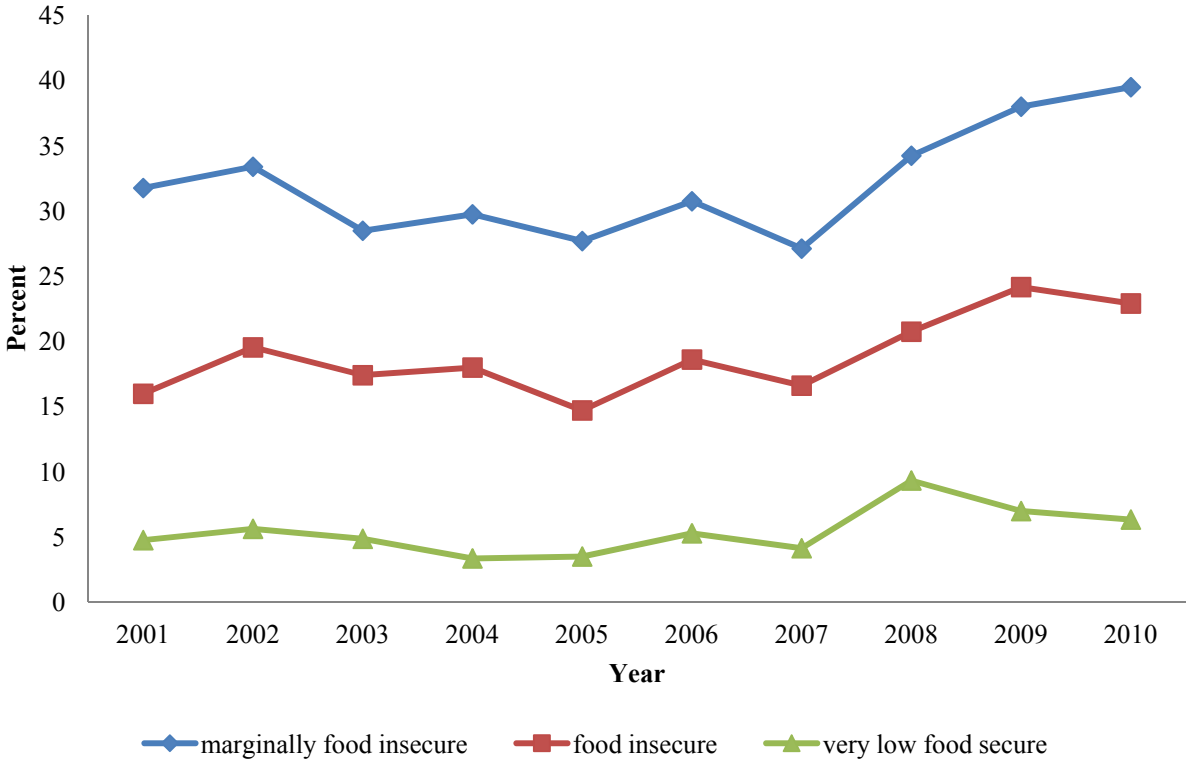
Figure 4. Food Insecurity among Householders Age 40+ without Grandchildren Present



In Figures 4 and 5 we show trends in food insecurity by the absence or presence of grandchildren in the household. Not surprising, given their preponderance in the adult population, in Figure 4 we see that the trends facing households with no grandchild present mirror the trends overall. However, comparisons of columns (2) and (3) of Table 1 and Figures 5 to 4 we see that rates of food insecurity in households with a grandchild present are generally at least 2 times higher in a typical year. Specifically, if no grandchild is present the average rates across the decade are 14.9, 8.5, and 3.1 percent, respectively, while with a grandchild present the corresponding rates are 32.5, 19.2, and 5.6 percent. Although the overall percentage change increase in those facing food insecurity are similar across households with and without grandchildren, the trends followed slightly different paths. After a staggering increase in very low food security of 125% between 2007 and 2008 in households with grandchildren, the rates

fell during the recession perhaps in response to expansions in the Supplemental Nutrition Assistance Program (SNAP) as part of the American Recovery Act of 2009. However, very low food security in households with grandchildren in 2010 was still 53 percent higher than in 2007. The level and trend of food hardship facing adult households poses a serious public policy challenge, and multigenerational households are at even greater risk.

Figure 5. Food Insecurity among Householders Age 40+ with Grandchildren Present



In Tables 2-4 we present the distribution of adult Americans (pooled and by presence of grandchildren) across the three levels of food insecurity. Each subcategory in the table sums to 100 percent for the respective food insecurity status. For example, one question Table 2 answers is "Among the marginally food insecure, what fraction of that population is white, African American, or other racial category?" In this case Table 2 shows that 73 percent are white, 21 percent are African American, and the remainder are of some other race.

Comparisons of columns (2) and (3) indicate whether certain categories are more likely to have grandchildren present. Across all three measures of food insecurity, the following categories are more likely to have grandchildren present: the very poor, African-Americans, Hispanics, widowed and never-married, homeowners, those in the South, the retired, high school dropouts, and those headed by a woman. Restricting our attention to marginal food security and food insecurity, the following categories are more likely to have grandchildren present: those with incomes below 100% of the poverty line, and the disabled.

Table 2. Marginal Food Insecurity by Category of Adults Age 40+

	All	No Grandchildren Present	Grandchildren Present
Income Categories			
Below 50% of the Poverty Line	8.02	7.60	12.40*
Between 50% and 100% of the Poverty Line	18.67	18.27	22.84*
Between 100% and 200% of the Poverty Line	29.73	29.59	31.10
Above 200% of the Poverty Line	29.14	30.37	16.24*
Missing Income	14.45	14.17	17.42*
Racial Categories			
White	73.12	74.03	63.61*
African American	21.17	20.25	30.73*
Other	5.72	5.72	5.67
Hispanic Ethnicity	18.32	17.77	24.01*
Marital Status			
Married	49.34	49.44	48.32
Widowed	11.65	11.25	15.84*
Divorced or Separated	25.87	25.88	25.76
Never Married	13.14	13.43	10.08*
Homeowner	59.27	58.74	64.83*
Geographic Location			
Non-Metro	19.91	19.87	20.35
Northeast	17.26	17.58	13.90*
Midwest	20.13	20.60	15.27*
South	40.16	39.25	49.67*
West	22.45	22.57	21.17
Age			
40 to 44	21.22	21.96	13.39*
45 to49	19.89	20.04	18.26*
50 to 54	16.54	16.48	17.17

55 to 59	12.25	11.92	15.68*
60 to 64	9.51	9.25	12.25*
65 to 69	6.61	6.41	8.74*
70 to 74	5.25	5.21	5.67
75 to 79	4.12	4.09	4.36
80 and older	4.62	4.64	4.49
Employment Status			
Employed	46.58	47.14	40.73*
Unemployed	7.10	7.23	5.65*
Retired	18.27	18.03	20.87*
Disabled	28.05	27.60	32.75*
Education Level			
Less Than High School	29.68	28.73	39.66*
High School Diploma	35.54	35.51	35.76
Some College	23.67	24.12	19.02*
College Degree	11.11	11.64	5.55*
Food Stamp Recipient	20.62	19.14	36.06*
Grandchild or Parent Present			
No Grandchild or Parent	91.27	100.00	0.00 [a]
Grandchild and Parent	6.38	0.00	73.08*
Grandchild Only	2.35	0.00	26.92*
Female	56.32	55.41	65.75*
Living Alone	21.45	23.50	0.00 [a]

*Denotes the difference in means between samples with and without grandchildren are statistically different from zero at the 5% level. [a] Denotes no basis for comparison.

Table 3. Food Insecurity by Category of Adults Age 40+

	All	No Grandchildren Present	Grandchildren Present
Income Categories			
Below 50% of the Poverty Line	10.10	9.64	14.79*
Between 50% and 100% of the Poverty Line	20.87	20.48	24.83*
Between 100% and 200% of the Poverty Line	29.46	29.35	30.60
Above 200% of the Poverty Line	25.43	26.62	13.47*
Missing Income	14.13	13.91	16.31*
Racial Categories			
White	71.29	72.36	60.56*
African American	22.82	21.77	33.38*
Other	5.89	5.87	6.06
Hispanic Ethnicity	19.13	18.72	23.23*
Marital Status			
Married	45.96	45.90	46.56
Widowed	11.06	10.60	15.66*

Divorced or Separated	28.87	29.06	27.04
Never Married	14.10	14.43	10.75*
Homeowner	54.32	53.60	61.58*
Geographic Location			
Non-Metro	19.48	19.39	20.37
Northeast	16.61	16.90	13.70*
Midwest	20.08	20.44	16.46*
South	40.94	40.12	49.20*
West	22.38	22.55	20.65
Age			
40 to 44	22.25	23.02	14.47*
45 to49	21.19	21.44	18.69*
50 to 54	17.16	17.16	17.17
55 to 59	12.40	12.09	15.54*
60 to 64	9.32	9.03	12.21*
65 to 69	6.18	5.92	8.80*
70 to 74	4.45	4.39	5.04
75 to 79	3.51	3.45	4.18
80 and older	3.55	3.52	3.91
Employment Status			
Employed	44.15	44.75	38.20*
Unemployed	8.28	8.47	6.36*
Retired	15.41	15.10	18.56*
Disabled	32.15	31.68	36.89*
Education Level			
Less Than High School	31.31	30.39	40.56*
High School Diploma	34.58	34.58	34.55
Some College	24.17	24.62	19.69*
College Degree	9.94	10.41	5.20*
Food Stamp Recipient	25.68	24.20	40.46*
Grandchild or Parent Present			
No Grandchild or Parent	90.93	100.00	0.00 [a]
Grandchild and Parent	6.58	0.00	72.56*
Grandchild Only	2.49	0.00	27.44*
Female	56.49	55.56	65.79*
Living Alone	22.65	24.91	0.00 [a]

*Denotes the difference in means between samples with and without grandchildren are statistically different from zero at the 5% level. [a] Denotes no basis for comparison.

Table 4. Very Low Food Security by Category of Adults Age 40+

	All	No Grandchildren Present	Grandchildren Present
Income Categories			
Below 50% of the Poverty Line	12.29	11.72	19.48*

Between 50% and 100% of the Poverty Line	24.61	24.44	26.83
Between 100% and 200% of the Poverty Line	28.90	29.07	26.72
Above 200% of the Poverty Line	22.08	22.88	12.00*
Missing Income	12.12	11.90	14.97
Racial Categories			
White	70.99	72.16	56.37*
African American	23.52	22.47	36.58*
Other	5.49	5.37	7.05
Hispanic Ethnicity	15.73	15.37	20.30*
Marital Status			
Married	38.13	37.68	43.67*
Widowed	11.19	10.88	15.03*
Divorced or Separated	34.58	35.01	29.20*
Never Married	16.11	16.43	12.10*
Homeowner	47.84	47.07	57.42*
Geographic Location			
Non-Metro	18.11	18.16	17.58*
Northeast	17.27	17.55	13.67*
Midwest	20.75	21.22	14.85*
South	40.13	39.35	50.00*
West	21.85	21.88	21.48
Age			
40 to 44	21.36	21.80	15.87*
45 to49	21.18	21.48	17.49*
50 to 54	18.80	18.88	17.85
55 to 59	13.34	13.00	17.62*
60 to 64	9.71	9.59	11.22
65 to 69	5.99	5.85	7.76
70 to 74	3.81	3.83	3.56
75 to 79	2.86	2.73	4.40
80 and older	2.94	2.84	4.24
Employment Status			
Employed	39.08	39.21	37.49
Unemployed	10.00	10.13	8.31
Retired	13.72	13.18	20.58*
Disabled	37.19	37.48	33.62
Education Level			
Less Than High School	29.50	28.79	38.40*
High School Diploma	34.20	34.23	33.75
Some College	26.57	27.24	18.14*
College Degree	9.73	9.73	9.71
Food Stamp Recipient	31.95	30.78	46.59*
Grandchild or Parent Present			

No Grandchild or Parent	92.62	100.00	0.00 [a]
Grandchild and Parent	5.55	0.00	75.19*
Grandchild Only	1.83	0.00	24.81*
Female	57.17	56.30	68.07*
Living Alone	29.89	32.27	0.00 [a]

*Denotes the difference in means between samples with and without grandchildren are statistically different from zero at the 5% level. [a] Denotes no basis for comparison.

B. Differences across States and Major Metropolitan Areas

The percentage of adult households experiencing food insecurity varies widely across states. Tables 5-7 along with Figures 6-14 present the average state rates of marginal food insecurity, food insecurity, and very low food security for all adults over 40 and by presence of grandchildren. Overall rates of marginal food insecurity range from 7.8 percent in North Dakota to 24.9 percent in Mississippi, but in households with grandchildren the level is much higher and the range is wider spanning from just under 19 percent in Oregon to over 45 percent in North Carolina.

Table 5. Marginal Food Insecurity among Adults Age 40+ by State

	All	No Grandchildren Present	Grandchildren Present		All	No Grandchildren Present	Grandchildren Present
AK	16.92	16.41	31.24	MT	14.81	14.46	26.07
AL	17.55	16.56	36.52	NC	17.59	16.33	45.34
AR	21.17	19.96	40.68	ND	7.79	7.27	26.94
AZ	17.13	16.53	29.14	NE	11.27	10.90	25.41
CA	16.72	15.89	33.09	NH	11.10	10.82	19.77
CO	12.86	12.30	31.06	NJ	12.83	12.29	27.19
CT	12.07	11.25	37.56	NM	20.82	20.05	38.26
DC	17.45	16.95	28.28	NV	14.23	14.00	19.56
DE	11.04	10.56	21.83	NY	15.33	14.86	27.22
FL	16.26	15.44	37.89	OH	16.79	16.04	37.40
GA	17.68	16.73	35.64	OK	17.90	17.27	28.28
HI	14.58	13.52	24.87	OR	15.40	15.30	18.86
IA	14.02	13.61	35.09	PA	14.77	14.07	34.50
ID	14.42	14.15	20.18	RI	14.72	14.45	26.87

IL	13.33	12.80	25.01	SC	20.22	18.91	44.15
IN	13.21	12.75	26.21	SD	12.90	12.34	40.51
KS	15.92	15.36	32.63	TN	16.99	15.96	36.23
KY	16.05	15.43	30.03	TX	20.67	19.15	41.80
LA	17.38	16.52	28.17	UT	17.44	16.72	29.10
MA	11.03	10.78	20.80	VA	10.83	10.08	26.03
MD	13.69	13.31	21.05	VT	13.94	13.62	31.60
ME	16.43	15.91	36.00	WA	14.60	14.35	22.43
MI	14.63	14.24	25.97	WI	11.87	11.57	27.72
MN	10.37	10.17	19.51	WV	15.34	15.06	21.72
MO	15.04	14.57	27.57	WY	13.60	13.32	23.55
MS	24.93	23.26	44.40				

Table 6. Food Insecurity among Adults Age 40+ by State

	All	No Grandchildren Present	Grandchildren Present		All	No Grandchildren Present	Grandchildren Present
AK	9.05	8.64	20.51	MT	8.71	8.44	17.49
AL	10.62	9.95	23.44	NC	10.28	9.27	32.53
AR	11.61	11.07	20.39	ND	3.74	3.41	15.91
AZ	9.67	9.06	21.74	NE	6.59	6.39	14.24
CA	9.52	9.07	18.47	NH	5.36	5.23	9.38
CO	7.44	7.12	17.93	NJ	7.04	6.67	17.14
CT	6.59	6.06	23.16	NM	11.60	11.13	22.07
DC	10.28	10.00	16.45	NV	8.44	8.32	11.19
DE	5.92	5.60	13.25	NY	8.67	8.40	15.53
FL	9.43	8.98	21.45	OH	10.04	9.46	25.87
GA	10.39	9.80	21.46	OK	10.40	9.93	18.21
HI	8.32	7.45	16.67	OR	8.74	8.66	11.37
IA	7.54	7.22	24.17	PA	7.64	7.21	19.71
ID	7.45	7.28	11.10	RI	8.44	8.25	16.95
IL	7.41	7.17	12.84	SC	11.25	10.44	26.12
IN	7.80	7.35	20.65	SD	6.70	6.36	23.60
KS	8.50	8.22	17.10	TN	9.83	9.29	19.94
KY	8.59	8.43	12.06	TX	12.35	11.53	23.73
LA	9.88	9.12	19.36	UT	9.16	8.82	14.61
MA	6.18	6.02	12.24	VA	6.23	5.76	15.72
MD	7.58	7.45	10.02	VT	7.21	7.17	9.62
ME	9.12	8.81	20.84	WA	8.39	8.33	10.17
MI	7.77	7.51	15.42	WI	6.22	5.97	19.40
MN	5.53	5.38	12.56	WV	8.63	8.31	16.00

MO	9.77	9.40	19.80	WY	6.85	6.81	8.26
MS	14.55	13.82	22.98				

Table 7. Very Low Food Security among Adults Age 40+ by State

	All Seniors	No Grandchildren Present	Grandchildren Present		All Seniors	No Grandchildren Present	Grandchildren Present
AK	3.27	3.17	6.17	MT	3.52	3.44	6.20
AL	3.40	3.37	4.08	NC	3.26	3.03	8.39
AR	3.81	3.71	5.28	ND	1.09	1.08	1.39
AZ	3.40	3.27	5.82	NE	2.81	2.79	3.70
CA	3.09	2.92	6.39	NH	2.06	2.04	2.57
CO	2.80	2.76	4.25	NJ	2.59	2.57	3.26
CT	2.57	2.41	7.42	NM	4.41	4.45	3.60
DC	3.28	3.28	3.15	NV	3.20	3.27	1.69
DE	2.28	1.96	9.50	NY	3.01	2.91	5.59
FL	3.63	3.41	9.67	OH	3.68	3.59	6.12
GA	3.61	3.35	8.58	OK	3.99	3.89	5.72
HI	2.56	2.42	3.93	OR	3.89	3.92	2.75
IA	2.73	2.60	9.03	PA	2.83	2.79	4.15
ID	2.31	2.40	0.59	RI	3.01	3.00	3.23
IL	2.47	2.43	3.22	SC	3.66	3.55	5.53
IN	3.24	3.14	6.15	SD	2.46	2.43	4.20
KS	3.65	3.54	6.87	TN	3.06	3.13	1.70
KY	2.97	2.95	3.36	TX	4.20	4.02	6.75
LA	2.90	2.93	2.53	UT	3.20	3.08	5.24
MA	2.68	2.62	5.05	VA	2.27	2.15	4.82
MD	3.23	3.16	4.58	VT	2.60	2.60	2.49
ME	3.87	3.71	9.89	WA	3.19	3.25	1.48
MI	3.02	2.97	4.60	WI	1.91	1.85	4.83
MN	1.98	1.99	1.37	WV	3.29	3.36	1.87
MO	3.57	3.52	4.76	WY	2.44	2.41	3.46
MS	5.18	4.83	9.25				

The maps in Figures 6–14 reveal that with few exceptions, households in the South experience the highest rates of food insecurity across the three categories. For example, focusing on adults at-risk of hunger, 9 of the 10 states with the highest rates are in the South, and of the 16

states plus the District of Columbia that comprise the South, 13 are in the top 20 states in terms of food insecurity. The states with the lowest prevalence of food insecurity among the three measures include the Plains states. But in Figures 12-14 we see that food insecurity in multigenerational households is more geographically dispersed, especially very low food security. While food insecure adults with grandchildren present are still more likely to be found in the South, in this case only 7 of the top 20 states are located in the South.

Figure 6: State Marginal Food Insecurity Rates for Adults Age 40+

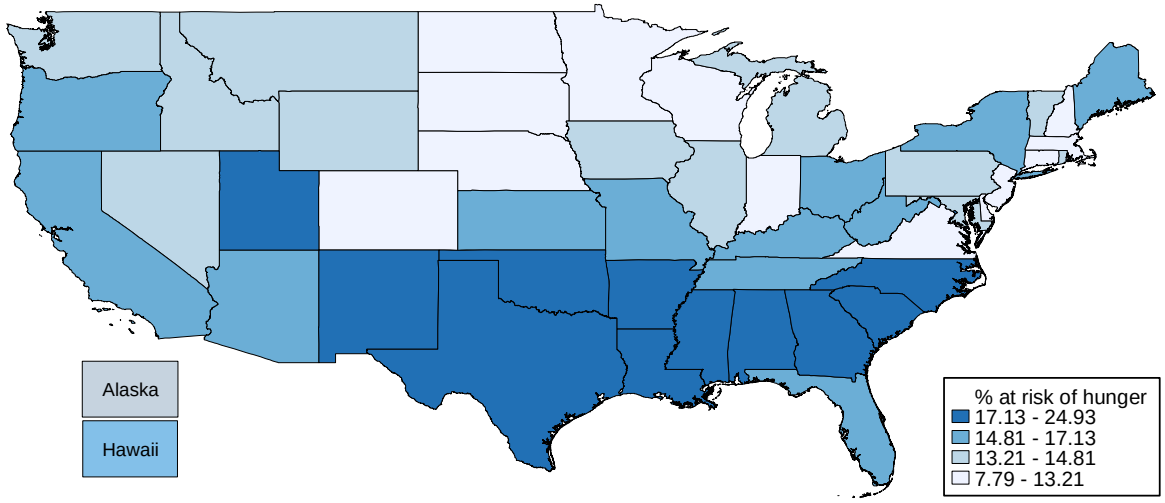


Figure 7: State Food Insecurity Rates for Adults Age 40+

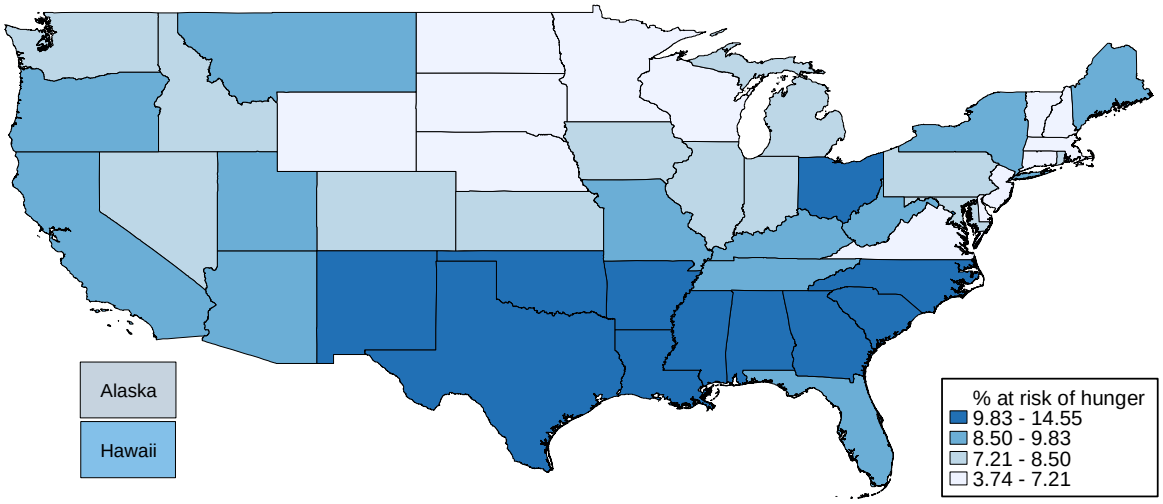


Figure 8: State Very Low Food Security Rates for Adults Age 40+

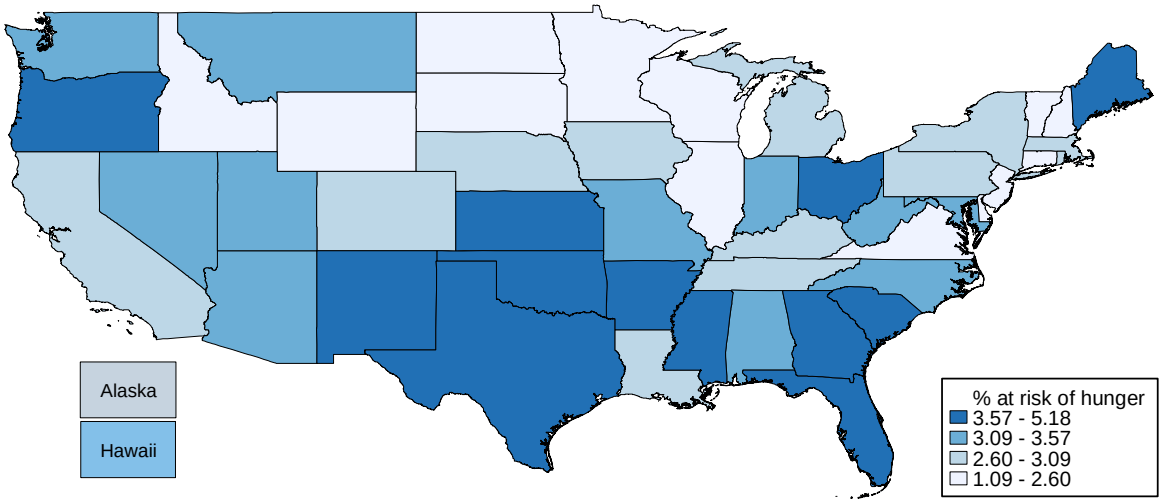


Figure 9: State Marginal Food Insecurity Rates for Adults Age 40+ with no Grandchildren Presnt

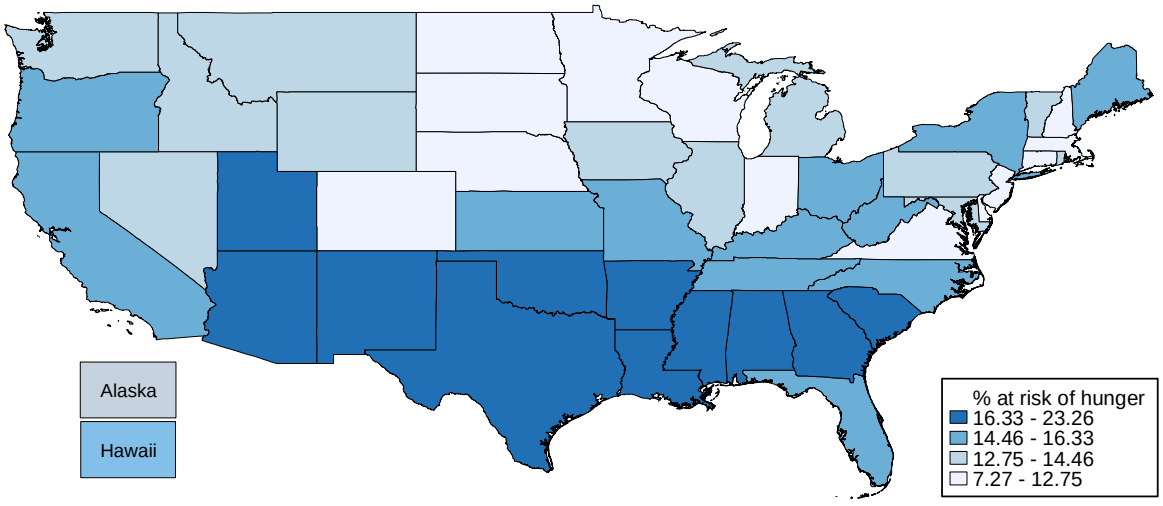


Figure 10: State Food Insecurity Rates for Adults Age 40+ with no Grandchildren Present

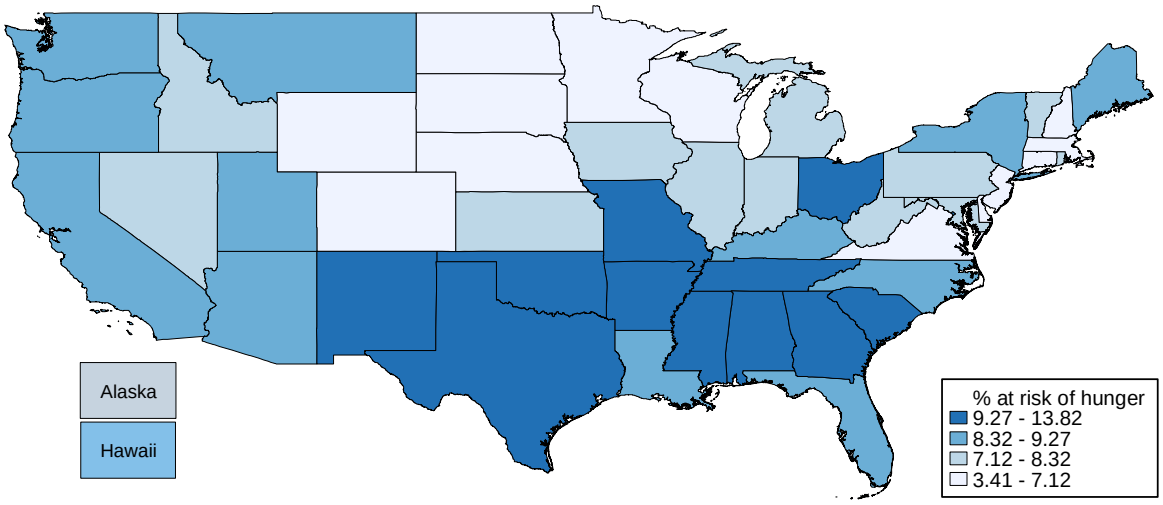


Figure 11: State Very Low Food Security Rates for Adults Age 40+ with no Grandchilden Present

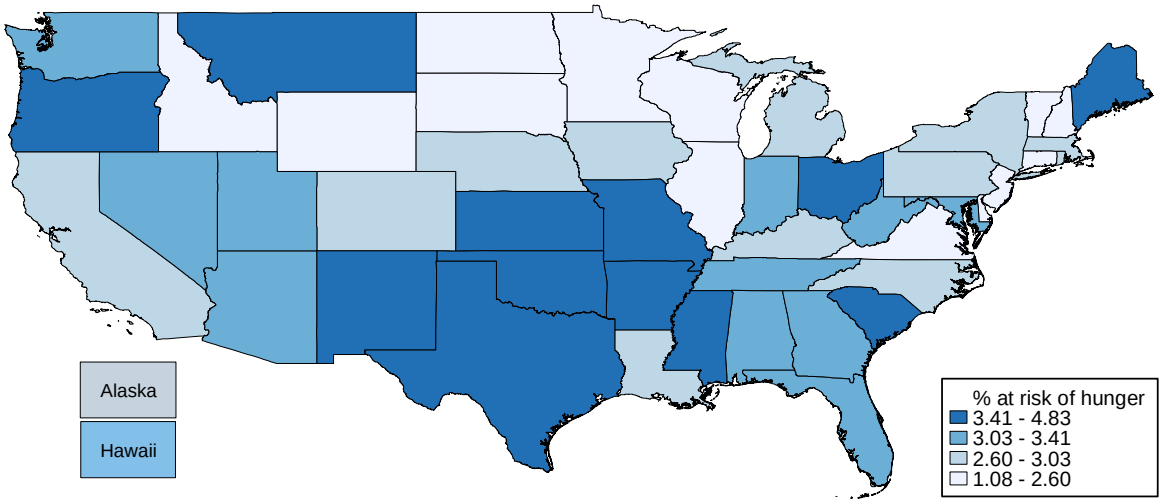


Figure 12: State Marginal Food Insecurity Rates for Adults Age 40+ with Grandchildren Present

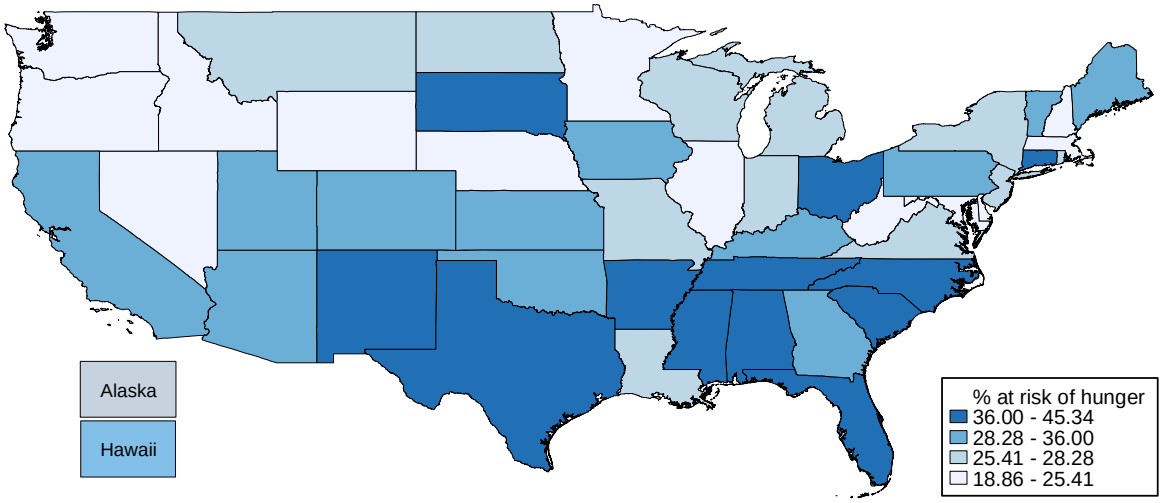


Figure 13: State Food Insecurity Rates for Adults Age 40+ with Grandchildren Present

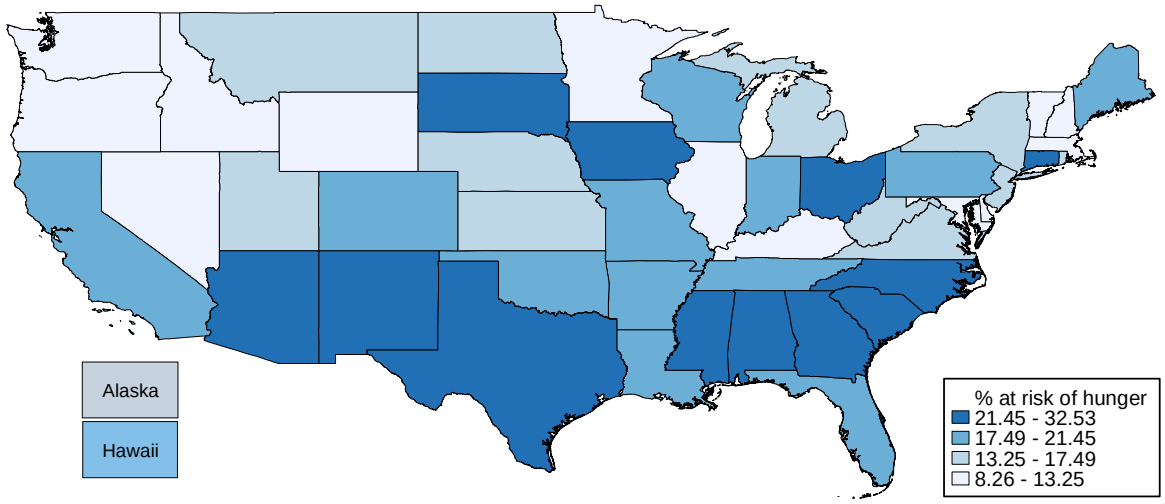
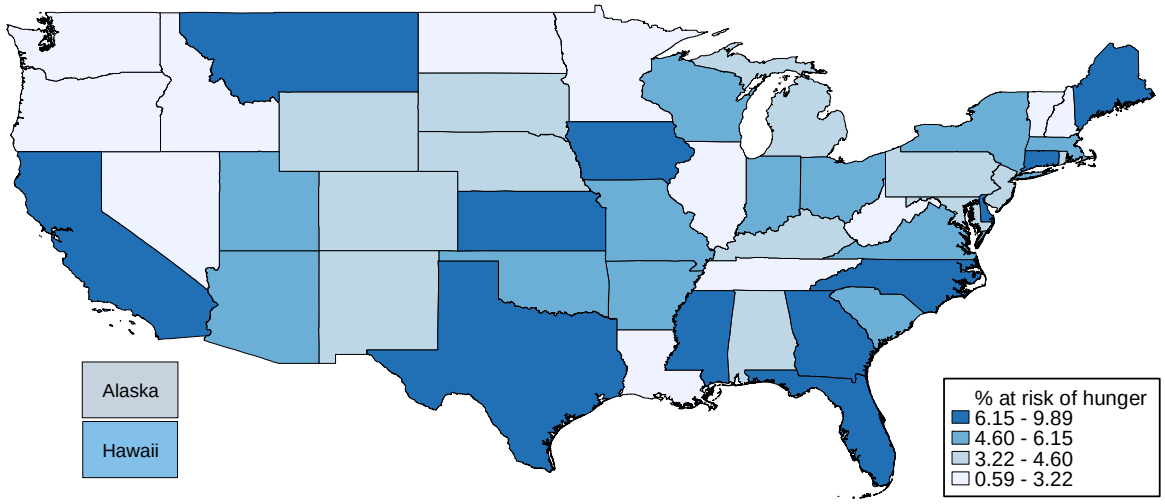


Figure 14: State Very Low Food Security Rates for Adults Age 40+ with Grandchilden Present



In Tables 8-10 we present the three categories of food insecurity for the major metropolitan areas with at least 1,000,000 residents. We restrict this to larger metro areas in order to reduce the chances of spurious relationships owing to small sample sizes. Even still, in the tables of households with grandchildren we see that there are several metro areas with zeros which is not likely because they do not contain food insecure families with grandchildren, rather

such families were not surveyed. As shown previously, about 80 percent of non-food secure households are located in metropolitan areas, whether grandchildren are present or not. Averaging across the 50 major metro areas shows that food insecurity rates in each of the three categories are similar to the national averages in Figures 3-5. However, Table 9 shows that the range of food insecurity rates are wide across major metro areas, from as low as 9.6 percent in Richmond, VA to as high as 23.5 in San Antonio, TX in the sample of no grandchildren, and from 5.3 percent in San Jose to as high as 54.2 percent in Hartford, CT in the sample with grandchildren. Thus food insecurity is a significant challenge in many major cities, and yet seems quite modest in many others.

Table 8. Marginal Food Insecurity among Adults Age 40+ in Metropolitan Areas>1,000,000

	All	No Grandchildren Present	Grandchildren Present
Atlanta-Sandy Springs-Marietta, GA	16.64	15.89	32.16
Austin-Round Rock, TX	16.49	15.47	34.75
Baltimore-Towson, MD	15.62	15.19	23.06
Birmingham-Hoover, AL	16.97	15.12	52.04
Boston-Cambridge-Quincy, MA-NH	11.80	11.54	20.95
Buffalo-Niagara Falls, NY	15.79	15.42	24.81
Charlotte-Gastonia-Concord, NC-SC	21.91	20.95	51.26
Chicago-Naperville-Joliet, IN-IN-WI	13.94	13.47	24.31
Cincinnati-Middletown, OH-KY-IN	17.78	16.37	52.82
Cleveland-Elyria-Mentor, OH	16.25	15.73	30.38
Columbus, OH	18.91	18.42	30.18
Dallas-Fort Worth-Arlington, TX	20.20	18.71	44.31
Denver-Aurora, CO	13.12	12.63	30.04
Detroit-Warren-Livonia, MI	15.63	15.30	25.34
Greensboro-High Point, NC	13.70	13.70	0.00
Hartford-West Hartford-East Hartford, CT	12.53	11.14	54.20
Houston-Baytown-Sugar Land, TX	19.31	18.02	37.54
Indianapolis, IN	11.19	11.15	12.82
Jacksonville, FL	20.71	19.24	52.58
Kansas City, MO-KS	13.90	13.53	23.71
Las Vegas-Paradise, NM	16.14	16.30	13.36
Los Angeles-Long Beach-Santa Ana, CA	19.17	18.37	32.76

Louisville, KY-IN	15.82	15.32	30.89
Memphis, TN-MS-AR	15.93	15.56	23.80
Miami-Fort Lauderdale-Miami Beach, FL	18.95	18.33	31.26
Milwaukee-Waukesha-West Allis, WI	15.48	14.91	37.52
Minneapolis-St Paul-Bloomington, MN-WI	10.87	10.65	22.25
Nashville-Davidson-Murfreesboro, TN	13.74	13.85	10.92
New Orleans-Metairie-Kenner, LA	12.56	12.64	11.65
New York-Northern New Jersey-Long Island	14.43	13.95	26.79
Oklahoma City, OK	10.86	10.05	24.34
Orlando, FL	23.16	22.67	39.04
Philadelphia-Camden-Wilmington, PA-NJ-DE	13.95	13.68	20.08
Phoenix-Mesa-Scottsdale, AZ	15.35	14.61	32.86
Pittsburgh, PA	16.06	15.13	48.37
Portland-Vancouver-Beaverton, OR-WA	15.88	15.94	13.62
Providence-Fall River-Warwick, MA-RI	16.18	15.93	28.99
Richmond, VA	10.27	9.55	19.52
Riverside-San Bernardino, CA	21.56	20.11	42.17
Rochester, NY	16.80	16.39	25.13
Sacramento--Arden-Arcade-Roseville, CA	17.55	17.20	28.41
Salt Lake City, UT	20.12	19.64	25.28
San Antonio, TX	24.43	23.45	41.95
San Diego-Carlsbad-San Marcos, CA	12.77	12.35	20.70
San Francisco-Oakland-Fremont, CA	12.05	11.30	34.69
San Jose-Sunnyvale-Santa Clara, CA	10.67	10.80	5.30
Seattle-Tacoma-Bellevue, WA	14.00	13.81	22.86
St. Louis, MO-IL	14.18	13.53	28.64
Tampa-St. Petersburg-Clearwater, FL	14.30	13.38	38.86
Virginia Beach-Norfolk-Newport News, VA-	13.51	12.07	30.53
Washington-Arlington-Alexandria, DC-VA-M	10.83	10.73	13.19

Table 9. Food Insecurity among Adults Age 40+ in Metropolitan Areas>1,000,000

	All	No Grandchildren Present	Grandchildren Present
Atlanta-Sandy Springs-Marietta, GA	9.46	8.81	22.86
Austin-Round Rock, TX	9.20	8.83	15.68
Baltimore-Towson, MD	8.39	8.06	13.98
Birmingham-Hoover, AL	8.55	7.59	26.81
Boston-Cambridge-Quincy, MA-NH	6.26	6.20	8.15
Buffalo-Niagara Falls, NY	6.60	5.86	24.81
Charlotte-Gastonia-Concord, NC-SC	14.22	13.22	44.60
Chicago-Naperville-Joliet, IN-IN-WI	8.10	7.76	15.64
Cincinnati-Middletown, OH-KY-IN	11.71	10.81	34.16

Cleveland-Elyria-Mentor, OH	10.80	10.69	13.70
Columbus, OH	11.00	10.49	22.70
Dallas-Fort Worth-Arlington, TX	11.97	10.97	28.02
Denver-Aurora, CO	7.47	7.25	15.30
Detroit-Warren-Livonia, MI	8.44	7.97	22.31
Greensboro-High Point, NC	7.40	7.40	0.00
Hartford-West Hartford-East Hartford, CT	7.33	6.35	36.55
Houston-Baytown-Sugar Land, TX	12.91	11.84	27.97
Indianapolis, IN	6.98	6.96	8.08
Jacksonville, FL	10.51	10.61	8.24
Kansas City, MO-KS	9.01	8.46	23.71
Las Vegas-Paradise, NM	9.33	9.36	8.88
Los Angeles-Long Beach-Santa Ana, CA	10.32	9.84	18.60
Louisville, KY-IN	8.96	8.97	8.48
Memphis, TN-MS-AR	10.11	9.70	18.54
Miami-Fort Lauderdale-Miami Beach, FL	9.76	9.48	15.39
Milwaukee-Waukesha-West Allis, WI	7.65	7.33	19.84
Minneapolis-St Paul-Bloomington, MN-WI	6.04	5.86	15.61
Nashville-Davidson-Murfreesboro, TN	6.49	6.75	0.00
New Orleans-Metairie-Kenner, LA	7.86	7.56	11.65
New York-Northern New Jersey-Long Island	8.40	8.14	14.89
Oklahoma City, OK	6.35	5.78	15.78
Orlando, FL	15.57	14.98	34.89
Philadelphia-Camden-Wilmington, PA-NJ-DE	7.30	7.13	11.19
Phoenix-Mesa-Scottsdale, AZ	9.13	8.35	27.80
Pittsburgh, PA	8.64	8.52	12.78
Portland-Vancouver-Beaverton, OR-WA	9.30	9.47	2.60
Providence-Fall River-Warwick, MA-RI	9.63	9.41	21.22
Richmond, VA	2.84	2.84	2.82
Riverside-San Bernardino, CA	13.16	11.84	31.86
Rochester, NY	8.27	7.81	17.49
Sacramento--Arden-Arcade-Roseville, CA	8.77	8.77	8.60
Salt Lake City, UT	11.12	11.02	12.16
San Antonio, TX	13.45	13.11	19.44
San Diego-Carlsbad-San Marcos, CA	8.81	8.46	15.41
San Francisco-Oakland-Fremont, CA	7.16	6.91	14.57
San Jose-Sunnyvale-Santa Clara, CA	5.92	5.93	5.30
Seattle-Tacoma-Bellevue, WA	8.37	8.31	11.17
St. Louis, MO-IL	8.96	8.69	14.98
Tampa-St. Petersburg-Clearwater, FL	8.03	7.91	11.19
Virginia Beach-Norfolk-Newport News, VA-	7.83	7.34	13.66
Washington-Arlington-Alexandria, DC-VA-M	6.71	6.68	7.57

Table 10. Very Low Food Security among Adults Age 40+ in Metropolitan Areas>1,000,000

	All	No Grandchildren Present	Grandchildren Present
Atlanta-Sandy Springs-Marietta, GA	3.13	2.88	8.35
Austin-Round Rock, TX	2.93	2.68	7.38
Baltimore-Towson, MD	3.74	3.52	7.54
Birmingham-Hoover, AL	2.91	2.85	4.03
Boston-Cambridge-Quincy, MA-NH	3.76	3.71	4.95
Buffalo-Niagara Falls, NY	4.66	4.39	13.14
Charlotte-Gastonia-Concord, NC-SC	2.55	2.57	2.03
Chicago-Naperville-Joliet, IN-IN-WI	5.61	5.41	10.65
Cincinnati-Middletown, OH-KY-IN	4.27	4.29	3.69
Cleveland-Elyria-Mentor, OH	4.81	4.61	9.41
Columbus, OH	4.75	4.63	6.69
Dallas-Fort Worth-Arlington, TX	3.05	2.92	7.70
Denver-Aurora, CO	2.76	2.56	8.71
Detroit-Warren-Livonia, MI	3.27	3.27	0.00
Greensboro-High Point, NC	4.93	4.60	9.60
Hartford-West Hartford-East Hartford, CT	3.32	3.40	0.00
Houston-Baytown-Sugar Land, TX	4.30	4.50	0.00
Indianapolis, IN	4.63	4.47	8.96
Jacksonville, FL	3.28	3.46	0.00
Kansas City, MO-KS	3.37	3.34	3.78
Las Vegas-Paradise, NM	3.33	3.44	0.00
Los Angeles-Long Beach-Santa Ana, CA	3.29	3.45	0.00
Louisville, KY-IN	3.35	3.11	8.10
Memphis, TN-MS-AR	1.43	1.47	0.00
Miami-Fort Lauderdale-Miami Beach, FL	2.32	2.33	1.98
Milwaukee-Waukesha-West Allis, WI	1.63	1.70	0.00
Minneapolis-St Paul-Bloomington, MN-WI	2.23	2.23	2.23
Nashville-Davidson-Murfreesboro, TN	3.02	2.97	4.17
New Orleans-Metairie-Kenner, LA	3.02	2.63	9.46
New York-Northern New Jersey-Long Island	6.97	6.39	25.85
Oklahoma City, OK	2.96	2.92	4.03
Orlando, FL	3.49	3.08	13.06
Philadelphia-Camden-Wilmington, PA-NJ-DE	3.26	3.07	9.86
Phoenix-Mesa-Scottsdale, AZ	5.05	5.11	2.60
Pittsburgh, PA	0.83	0.68	2.82
Portland-Vancouver-Beaverton, OR-WA	5.54	4.98	13.59
Providence-Fall River-Warwick, MA-RI	2.25	2.36	0.00
Richmond, VA	4.37	4.51	0.00
Riverside-San Bernardino, CA	2.91	2.60	9.55
Rochester, NY	1.38	0.94	6.13
Sacramento--Arden-Arcade-Roseville, CA	5.54	5.71	2.35

Salt Lake City, UT	2.75	2.57	6.31
San Antonio, TX	2.31	2.09	8.95
San Diego-Carlsbad-San Marcos, CA	1.87	1.91	0.00
San Francisco-Oakland-Fremont, CA	3.19	3.25	0.00
San Jose-Sunnyvale-Santa Clara, CA	3.38	3.50	0.00
Seattle-Tacoma-Bellevue, WA	2.76	2.85	1.69
St. Louis, MO-IL	3.01	3.04	2.40
Tampa-St. Petersburg-Clearwater, FL	2.63	2.61	3.62
Virginia Beach-Norfolk-Newport News, VA-	2.32	2.11	8.61
Washington-Arlington-Alexandria, DC-VA-M	3.73	3.71	4.50

III. The Determinants of Food Insecurity in Multigenerational Households

The descriptive summary presented in Section II provides a broad overview of the extent and distribution of food insecurity in multi-generation families. In this section of our study we assess the determining factors of food insecurity in households with both a resident grandparent and grandchild. The objective of the analysis in this section is twofold. First, we want to identify the magnitude of food security disadvantage that multi-generation families face relative to households with no grandchildren present after we control for income and other factors. Second, we want to identify whether the determining factors of food insecurity differ in a substantive way between multi-generation households and households with no grandchild present. For example, in our earlier research (Ziliak, Gundersen, and Haist 2008) we found that relatively young seniors (i.e. between ages 60 and 70), those with low education attainment, and African-Americans, each had substantially greater risk of hunger than older seniors, highly educated, and whites, respectively, even controlling for income. In this section we test whether or not this pattern holds for multi-generation families as it does for the population of adults overall. Knowledge of whether differences exist will inform policymakers, program

administrators, and non-profit organizations of whether potential avenues for intervention to alleviate hunger risk need to be catered to different family structures.

Specifically we estimate the following models for food insecurity (FI):

$$FI_{ij} = X_{ij}\beta_j + u_{ij} \quad (1)$$

where i denotes a household and *j* denotes whether the grandchild is present in the household; *FI* is a variable that takes a value of 1 if the person experiences food insecurity (we alternatively use marginal food insecure, food insecure, and very low food secure), *X* is a vector of the potential determinants of food insecurity available in the CPS (e.g., income, race, Hispanic ethnicity, gender, marital status, employment status, homeownership status, age, region); *u* is an error term. When *FI* takes on one of two values we assume that the error term *u* is distributed standard normal and we apply probit maximum likelihood methods.

Our central interest is in the direction, significance, and magnitude of the coefficients on the demographic factors in **β**. The Box 1 insert indicates all the various demographic groups included in the regression model. All of the determinants are represented as a series of indicators, and thus there is an omitted group for each set. To test whether or not the factors determining food insecurity differ in multi-generation households compared to other adult households we estimate the models in (1) for families with a grandparent and grandchild present, and for those with no grandchild present. We then compare the magnitude and direction of coefficients across the models, and also conduct a formal Wald test to examine whether the coefficients differ statistically.

Box 1: Demographic Factors in Regression Models of Multigenerational Food Insecurity	
Race	White (omitted) African American Other
Ethnicity	Non-Hispanic (omitted) Hispanic

Education	High School Dropout (omitted) High School Graduate Some College College Degree or more
Marital Status	Never Married (omitted) Married Widowed Divorced/Separated
Age	60-64 (omitted) 65-69 70-74 75-79 80+
Income Level	Less than 50% of Poverty Line (omitted) 50-100% of Poverty Line 100-200% of Poverty Line > 200% of Poverty Line Missing
Housing Status	Renter (omitted) Homeowner
City Status	Live in Metro Area (omitted) Live in Non-Metro Area
Employment Status	Employed (omitted) Retired Unemployed Disabled
Gender	Male (omitted) Female
Region of Country	Midwest (omitted) South West Northeast
Family Structure	Lives with Others (omitted) Lives Alone

A. Demographic Factors and the Risk of Hunger

Tables 11-13 present the results of models of the determinants of marginal food insecurity, food insecurity, and very low food security, respectively, separately by presence of grandchildren. In addition to the demographic factors listed in Box 1, all models also control for year-specific influences.[3] For each specification we present both the coefficients from the probit

[3] We also estimated models with state fixed effects, which are intended to capture not readily observable state-specific influences on rates of food insecurity that do not vary over time. We do not include these in the main

model of equation (1) along with the so-called marginal effects. The coefficients tell us the direction of association (positive or negative) between a variable and the probability of food insecurity, while the marginal effects tell us the magnitude and direction of a one-unit change in the respective variable on the probability of food insecurity. For example, in the Table 11 specification with no grandchildren the positive coefficient of 0.343 on African American indicates that being African American increases the probability of being marginally food insecure relative to a white person, while the marginal effect of 0.062 implies that an African American is 6.2 percentage points more likely to be marginally food insecure relative to a white person.

Table 11. Estimated Determinants of Marginal Food Insecurity Rates among Adults Age 40+ by Presence of Grandchildren

	No Grandchildren		With Grandchildren	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Constant	0.160***		0.516***	
	(0.032)		(0.123)	
African American	0.343***	0.062***	0.173***	0.051***
	(0.013)	(0.002)	(0.042)	(0.013)
Other Race	0.067***	0.012***	-0.013	-0.004
	(0.019)	(0.004)	(0.069)	(0.020)
Hispanic	0.217***	0.039***	0.124**	0.037**
	(0.015)	(0.003)	(0.049)	(0.015)
High School	-0.205***	-0.037***	-0.199***	-0.059***
	(0.012)	(0.002)	(0.042)	(0.012)
Some College	-0.250***	-0.046***	-0.238***	-0.070***
	(0.013)	(0.002)	(0.049)	(0.014)
College	-0.571***	-0.104***	-0.382***	-0.113***
	(0.015)	(0.003)	(0.066)	(0.020)
Married	-0.114***	-0.021***	-0.039	-0.012
	(0.016)	(0.003)	(0.065)	(0.019)
Widowed	0.124***	0.023***	0.179**	0.053**
	(0.020)	(0.004)	(0.078)	(0.023)

models of the text because the comparatively small within-state samples of grandchild-present households creates less precise identification of parameters, i.e. some state's observations get dropped because all are food secure. However, the results are qualitatively similar whether state effects are included or not.

Divorced/Separated	0.194***	0.035***	0.214***	0.063***
	(0.016)	(0.003)	(0.069)	(0.021)
Age 44-49	-0.043***	-0.008***	0.116*	0.034*
	(0.013)	(0.002)	(0.061)	(0.018)
Age 50-54	-0.100***	-0.018***	0.067	0.020
	(0.014)	(0.003)	(0.061)	(0.018)
Age 55-59	-0.202***	-0.037***	0.030	0.009
	(0.015)	(0.003)	(0.062)	(0.018)
Age 60-64	-0.230***	-0.042***	-0.030	-0.009
	(0.017)	(0.003)	(0.065)	(0.019)
Age 65-69	-0.331***	-0.060***	-0.125	-0.037
	(0.020)	(0.004)	(0.077)	(0.023)
Age 70-74	-0.346***	-0.063***	-0.147*	-0.044*
	(0.023)	(0.004)	(0.089)	(0.026)
Age 75-79	-0.454***	-0.083***	-0.116	-0.034
	(0.025)	(0.004)	(0.099)	(0.029)
Age 80+	-0.597***	-0.109***	-0.134	-0.040
	(0.026)	(0.005)	(0.104)	(0.031)
50-100% Poverty	0.039	0.007	-0.187**	-0.055**
	(0.025)	(0.005)	(0.078)	(0.023)
100-200% Poverty	-0.195***	-0.035***	-0.510***	-0.151***
	(0.023)	(0.004)	(0.074)	(0.022)
>200% Poverty	-0.955***	-0.174***	-1.189***	-0.352***
	(0.023)	(0.004)	(0.077)	(0.022)
Missing Income	-0.886***	-0.161***	-0.979***	-0.290***
	(0.024)	(0.004)	(0.077)	(0.022)
Homeowner	-0.369***	-0.067***	-0.389***	-0.115***
	(0.010)	(0.002)	(0.041)	(0.012)
Non-Metro	0.015	0.003	-0.050	-0.015
	(0.010)	(0.002)	(0.040)	(0.012)
Retired	-0.092***	-0.017***	0.010	0.003
	(0.015)	(0.003)	(0.055)	(0.016)
Unemployed	0.516***	0.094***	0.346***	0.103***
	(0.021)	(0.004)	(0.088)	(0.026)
Disabled	0.314***	0.057***	0.238***	0.071***
	(0.012)	(0.002)	(0.042)	(0.012)
Female	0.017**	0.003**	0.009	0.003
	(0.008)	(0.002)	(0.035)	(0.010)
South	0.004	0.001	0.103**	0.031**
	(0.011)	(0.002)	(0.045)	(0.013)
West	0.005	0.001	0.062	0.018
	(0.012)	(0.002)	(0.053)	(0.016)
Northeast	-0.040***	-0.007***	-0.035	-0.010

	(0.013)	(0.002)	(0.057)	(0.017)
Lives alone	-0.090***	-0.016***		
	(0.013)	(0.002)		
Wald Test	180.480			
dof, p-value	[31,0.00]			
Observations	252803	252803	10299	10299

Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

Beginning with the results for marginal food insecurity in Table 11 we see that those households with no grandchildren facing greater risk of marginal food insecurity include non-whites, Hispanics, high school dropouts, widowed/divorced/separated, 40-64 year olds, the poor, renters, the disabled and unemployed, and those with other people living in the household. Several of the same patterns of effects hold for households with grandchildren present, although there are some important distinctions. First, there is no evidence of a declining age gradient in risk of marginal food insecurity. This was a prominent result of Ziliak et al. (2008) and Ziliak and Gundersen (2009) studies, and which holds in the sample with no grandchildren present. In the latter sample we see that a 65-69 year old is 6 percentage points less likely to be marginally food insecure than a 40-44 year old, and an 80 year old is 10.9 percentage points less likely. On a baseline average rate of 14.96 percent, these marginal effects are sizable, ranging from 40 percent to 70 percent of baseline. However, among households with grandchildren there is in general no statistically significant effect of age on the risk of food insecurity. Second, the "disadvantage" of certain demographic characteristics is less when a grandchild is present. For example, being an African American increases the probability of marginal food insecurity by over 40 percent from the baseline mean for households with no grandchildren present, but this effect is just 16 percent when grandchildren are present (the marginal effect of 0.051 in Table 11 compared to the mean of 0.3246 in Table 1). Third, the "advantage" of certain economic factors

is more prevalent among households with grandchildren, most notable of these is the strong protective effect of having incomes above the poverty line and especially over twice the line. It is because of these distinctions that the Wald test formally rejects the hypothesis that the coefficients on the determinants affecting marginal food insecurity are the same between households with and without grandchildren present (p-value < 0.000).

Tables 12 and 13 contain the set of regression coefficients and marginal effects for the probability of food insecurity and of very low food security, respectively. The pattern of results is quite similar to those found in Table 11, though as expected the quantitative magnitude of marginal effects are smaller since the probability of being food insecure or very low food secure is considerably lower than marginal food insecurity. Being disabled was seen to raise the probability of marginal food insecurity, and this is true of food insecurity too, but in Table 13 we see that disability has no additional risk for multigenerational household food insecurity. Conditional on income, race, and other covariates, previous analyses have found little difference between residents in a metro area versus non-metro for any of the three levels of food insecurity. However, Table 13 shows that living in a metro area substantially increases the probability of very low food security, especially among families with a grandchild present. For the latter the protective effect of living in a non-metro area is comparable in magnitude to having income between 50 and 100 percent of poverty instead of below half the poverty line.

Table 12. Estimated Determinants of Food Insecurity Rates among Adults Age 40+ by Presence of Grandchildren

	No Grandchildren		With Grandchildren	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Constant	-0.275***		-0.111	
	(0.035)		(0.128)	
African American	0.287***	0.035***	0.222***	0.051***
	(0.015)	(0.002)	(0.046)	(0.011)

Other Race	0.087***	0.011***	0.085	0.020
	(0.022)	(0.003)	(0.073)	(0.017)
Hispanic	0.181***	0.022***	0.072	0.017
	(0.017)	(0.002)	(0.054)	(0.012)
High School	-0.193***	-0.024***	-0.176***	-0.041***
	(0.014)	(0.002)	(0.045)	(0.011)
Some College	-0.198***	-0.024***	-0.146***	-0.034***
	(0.016)	(0.002)	(0.054)	(0.012)
College	-0.519***	-0.064***	-0.295***	-0.068***
	(0.018)	(0.002)	(0.078)	(0.018)
Married	-0.101***	-0.012***	0.003	0.001
	(0.018)	(0.002)	(0.069)	(0.016)
Widowed	0.139***	0.017***	0.203**	0.047**
	(0.024)	(0.003)	(0.083)	(0.019)
Divorced/Separated	0.218***	0.027***	0.217***	0.050***
	(0.018)	(0.002)	(0.072)	(0.017)
Age 44-49	-0.019	-0.002	0.041	0.009
	(0.015)	(0.002)	(0.065)	(0.015)
Age 50-54	-0.092***	-0.011***	-0.034	-0.008
	(0.016)	(0.002)	(0.066)	(0.015)
Age 55-59	-0.195***	-0.024***	-0.057	-0.013
	(0.017)	(0.002)	(0.068)	(0.016)
Age 60-64	-0.241***	-0.030***	-0.075	-0.017
	(0.020)	(0.002)	(0.072)	(0.017)
Age 65-69	-0.352***	-0.043***	-0.136	-0.031
	(0.024)	(0.003)	(0.084)	(0.020)
Age 70-74	-0.410***	-0.050***	-0.224**	-0.052**
	(0.028)	(0.003)	(0.100)	(0.023)
Age 75-79	-0.498***	-0.061***	-0.140	-0.033
	(0.031)	(0.004)	(0.110)	(0.025)
Age 80+	-0.682***	-0.084***	-0.226*	-0.052*
	(0.032)	(0.004)	(0.116)	(0.027)
50-100% Poverty	-0.048*	-0.006*	-0.190**	-0.044**
	(0.026)	(0.003)	(0.074)	(0.017)
100-200% Poverty	-0.267***	-0.033***	-0.458***	-0.106***
	(0.024)	(0.003)	(0.071)	(0.016)
>200% Poverty	-0.924***	-0.114***	-1.081***	-0.250***
	(0.024)	(0.003)	(0.077)	(0.017)
Missing Income	-0.812***	-0.100***	-0.862***	-0.200***
	(0.026)	(0.003)	(0.077)	(0.017)
Homeowner	-0.364***	-0.045***	-0.318***	-0.074***
	(0.012)	(0.001)	(0.044)	(0.010)
Non-Metro	-0.002	-0.000	-0.065	-0.015

	(0.012)	(0.001)	(0.043)	(0.010)
Retired	-0.066***	-0.008***	-0.033	-0.008
	(0.018)	(0.002)	(0.062)	(0.014)
Unemployed	0.505***	0.062***	0.333***	0.077***
	(0.023)	(0.003)	(0.089)	(0.020)
Disabled	0.339***	0.042***	0.288***	0.067***
	(0.013)	(0.002)	(0.046)	(0.010)
Female	0.006	0.001	-0.033	-0.008
	(0.010)	(0.001)	(0.040)	(0.009)
South	0.009	0.001	-0.021	-0.005
	(0.013)	(0.002)	(0.050)	(0.012)
West	-0.014	-0.002	-0.012	-0.003
	(0.015)	(0.002)	(0.059)	(0.014)
Northeast	-0.065***	-0.008***	-0.100	-0.023
	(0.015)	(0.002)	(0.064)	(0.015)
Lives alone	-0.044***	-0.005***		
	(0.015)	(0.002)		
Wald Test	108.398			
dof, p-value	[31,0.00]			
Observations	252803	252803	10299	10299

Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

Table 13. Estimated Determinants of Very Low Food Security Rates among Adults Age 40+ by Presence of Grandchildren

	No Grandchildren		With Grandchildren	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Constant	-1.106***		-0.874***	
	(0.047)		(0.175)	
African American	0.147***	0.008***	0.176***	0.017***
	(0.021)	(0.001)	(0.065)	(0.006)
Other Race	-0.001	-0.000	0.110	0.011
	(0.031)	(0.002)	(0.100)	(0.010)
Hispanic	-0.007	-0.000	-0.078	-0.008
	(0.024)	(0.001)	(0.075)	(0.007)
High School	-0.111***	-0.006***	-0.097	-0.010
	(0.019)	(0.001)	(0.062)	(0.006)
Some College	-0.053**	-0.003**	-0.092	-0.009
	(0.021)	(0.001)	(0.076)	(0.008)

College	-0.362***	-0.020***	0.163	0.016
	(0.026)	(0.001)	(0.102)	(0.010)
Married	-0.122***	-0.007***	-0.033	-0.003
	(0.024)	(0.001)	(0.096)	(0.009)
Widowed	0.123***	0.007***	0.101	0.010
	(0.031)	(0.002)	(0.115)	(0.011)
Divorced/Separated	0.204***	0.012***	0.128	0.013
	(0.023)	(0.001)	(0.099)	(0.010)
Age 44-49	0.005	0.000	-0.049	-0.005
	(0.021)	(0.001)	(0.092)	(0.009)
Age 50-54	-0.016	-0.001	-0.018	-0.002
	(0.022)	(0.001)	(0.090)	(0.009)
Age 55-59	-0.114***	-0.006***	-0.004	-0.000
	(0.024)	(0.001)	(0.094)	(0.009)
Age 60-64	-0.167***	-0.009***	-0.131	-0.013
	(0.028)	(0.002)	(0.103)	(0.010)
Age 65-69	-0.283***	-0.016***	-0.286**	-0.028**
	(0.034)	(0.002)	(0.121)	(0.012)
Age 70-74	-0.387***	-0.022***	-0.440***	-0.044***
	(0.040)	(0.002)	(0.151)	(0.015)
Age 75-79	-0.500***	-0.028***	-0.257*	-0.025*
	(0.045)	(0.003)	(0.153)	(0.015)
Age 80+	-0.663***	-0.038***	-0.269	-0.027
	(0.047)	(0.003)	(0.163)	(0.016)
50-100% Poverty	-0.014	-0.001	-0.232***	-0.023***
	(0.030)	(0.002)	(0.089)	(0.009)
100-200% Poverty	-0.239***	-0.014***	-0.549***	-0.054***
	(0.029)	(0.002)	(0.089)	(0.009)
>200% Poverty	-0.815***	-0.046***	-1.048***	-0.104***
	(0.030)	(0.002)	(0.101)	(0.010)
Missing Income	-0.725***	-0.041***	-0.802***	-0.079***
	(0.033)	(0.002)	(0.099)	(0.010)
Homeowner	-0.340***	-0.019***	-0.288***	-0.029***
	(0.016)	(0.001)	(0.061)	(0.006)
Non-Metro	-0.056***	-0.003***	-0.176***	-0.017***
	(0.017)	(0.001)	(0.061)	(0.006)
Retired	-0.021	-0.001	0.146	0.014
	(0.026)	(0.001)	(0.090)	(0.009)
Unemployed	0.496***	0.028***	0.302***	0.030***
	(0.029)	(0.002)	(0.109)	(0.011)
Disabled	0.366***	0.021***	0.106	0.010
	(0.018)	(0.001)	(0.066)	(0.007)
Female	-0.000	-0.000	0.032	0.003

	(0.014)	(0.001)	(0.057)	(0.006)
South	-0.001	-0.000	0.068	0.007
	(0.018)	(0.001)	(0.070)	(0.007)
West	-0.023	-0.001	0.125	0.012
	(0.020)	(0.001)	(0.080)	(0.008)
Northeast	-0.043**	-0.002**	-0.013	-0.001
	(0.021)	(0.001)	(0.088)	(0.009)
Lives alone	0.095***	0.005***		
	(0.020)	(0.001)		
Wald Test	166.28			
dof, p-value	[31,0.00]			
Observations	252803	252803	10299	10299

Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

B. Risk Profiles of Food Insecurity

To help characterize demographic risk profiles of marginal food insecurity, food insecurity, and very low food security for multigenerational households compared to those adult households with no grandchildren present, in Table 14 we present hypothetical predicted probabilities using data from the 2001 to 2010 CPS. Specifically we use the probit regression coefficients in Tables 11-13 to predict the probability of food insecurity based on certain demographic characteristics, namely how the risk of food insecurity varies by presence of grandchildren and by level of family income.

The first profile is of a senior that is white, retired, married, living in a metropolitan region, over the age of 80, and college educated. We chose this set of traits because we expect them to be a relatively low risk group for food insecurity. We pool the data across years, regions, and gender to thus isolate the former demographic characteristics. The first panel of Table 14 shows these predictions across the three levels of food insecurity. First, among this

Table 14. Predicted Risk Profiles of Food Insecurity (Percent)

Profile is a senior who is white, retired, married, living in metro area, > ages 80+, college

	Marginal Food Insecurity		Food Insecurity		Very Low Food Security	
	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present
Income						
< 50% Poverty	12.8	51.2	5.7	27.6	1.7	22.4
50-100% Poverty	13.6	43.7	5.1	21.6	1.6	15.9
100-200% Poverty	9.2	31.6	3.2	14.6	0.9	9.3
> 200% Poverty	1.8	12.3	0.6	4.7	0.2	3.3

Profile is a senior who is white, married, living in metro area, > ages 80+, college AND disabled

	Marginal Food Insecurity		Food Insecurity		Very Low Food Security	
	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present
Income						
< 50% Poverty	23.3	60.2	11.9	39.2	4.1	20.9
50-100% Poverty	24.5	52.8	11.0	32.1	3.9	14.7
100-200% Poverty	17.7	40.1	7.4	23.2	2.4	8.4
> 200% Poverty	4.6	17.6	1.8	8.8	0.5	3.0

Table 14 Continued

Profile is a senior who is African American, retired, divorced/separated, living in metro area, ages 60-64, high school dropout

	Marginal Food Insecurity		Food Insecurity		Very Low Food Security	
	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present
Income						
< 50% Poverty	67.5	82.7	49.3	61.2	20.8	33.3
50-100% Poverty	68.9	77.5	47.4	53.8	20.4	25.2
100-200% Poverty	60.2	66.7	38.8	43.2	14.6	16.0
> 200% Poverty	30.8	40.2	17.3	21.3	5.2	6.6

Profile is a senior who is African American, divorced/separated, living in metro area, ages 60-64, high school dropout AND disabled

	Marginal Food Insecurity		Food Insecurity		Very Low Food Security	
	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present	No Grandchildren	Grandchildren Present
Income						
< 50% Poverty	80.5	87.9	65.1	72.8	33.5	31.5
50-100% Poverty	81.6	83.7	63.3	66.2	33.0	23.6
100-200% Poverty	74.7	74.6	54.8	55.9	25.3	14.7
> 200% Poverty	46.2	49.2	29.6	31.7	10.7	6.0

demographic, the presence of grandchildren has a startling effect on the probability of food insecurity. Even though this group of older whites who are college educated should be low risk, adding a grandchild to the household raises the predicted probability of marginal food insecurity and food insecurity by at least a factor of 4, and of very low food security tenfold. There is clear evidence that income is a key protective factor against food insecurity for senior households without or with grandchildren present, but even still the model predicts that this hypothetical senior with a grandchild living in the home *and* family income above twice the poverty line is at equal or greater risk of food insecurity that a similar senior with no grandchild in the household but whose income is *below* half the poverty line.

The second panel is the same as the first except instead of the senior being categorized as retired their status is listed as disabled. We anticipate this group to be at greater risk of food insecurity than those over 80 who are simply retired, and for certain the predicted probabilities of food insecurity across all three categories are higher than in panel one (except for very low food secure with grandchildren). What is perhaps surprising is that disability status exacerbates food insecurity to a greater extent for those seniors without grandchildren present than those with, leading to at least twice as high a rate for the former as opposed to rates 25 to 50 percent higher. That is, the presence of grandchildren has a much more sizable effect on risk of senior hunger than does a disability. And in both panels we find that higher incomes provides greater protection against food insecurity when there is no grandchild present, especially once income exceeds twice the poverty line.

In the remaining two panels of Table 14 we repeat the exercise but for a much higher risk group of adults. In panel three we focus on a senior who is African American, retired, divorced or separated, living in a metro area, ages between 60 and 64, and a high school dropout. Panel

four replaces the retired criteria with disabled. Panels three and four make clear that food insecurity risk is extremely high for this demographic group—at least four times higher than in panel one for those without grandchildren living in the household, and about 50 percent higher in multigenerational households. Moreover, we see that the presence of grandchildren in the household does not have a substantial effect on food insecurity compared to the older and highly educated white senior in panels one and two. In addition, higher incomes do not provide as much protection against food insecurity for the high-risk profiles in panels three and four. In short, low educated, younger African Americans seniors remain at elevated risk for food insecurity across the income distribution.

C. The Depth and Severity of Food Insecurity

Our analyses thus far have focused on the demographic risk factors influencing the incidence of food insecurity. An alternative characterization is to retain the continuous nature of the 18 item food security scale and to instead measure the depth and severity of food insecurity utilizing all information in the scale (Gundersen 2008). Specifically, let z denote the worst possible score on the food security scale (10 if no kids present, 18 if kids are present in the household); and let s_i denote the individual's raw score on the food security scale, where s_i ranges from a low of 0 to a high of z. Then define f_i^{α} as

$$(2) \qquad f_i^{\alpha} = \left[\frac{s_i - e}{z - e}\right]^{\alpha} \text{ if } s_i > e;\ f_i^{\alpha} = 0 \text{ otherwise}$$

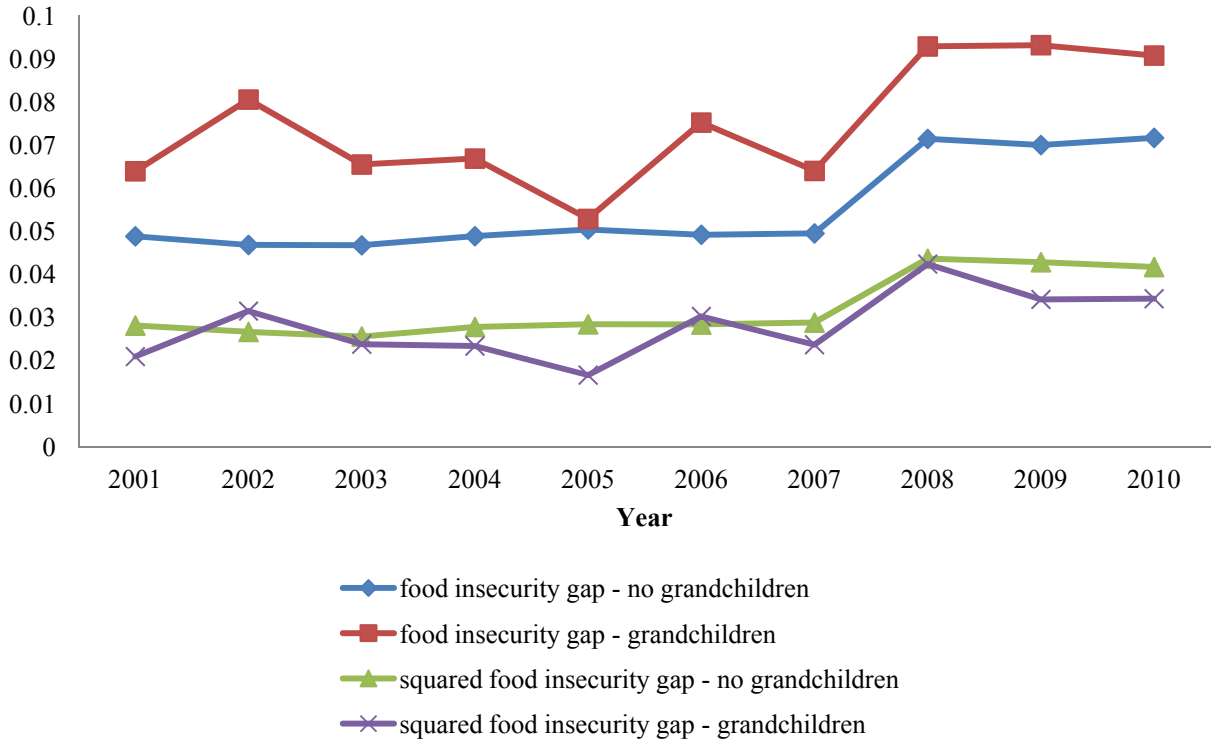
where e denotes a threshold score on the food security scale above which a person is food insecure and below which they are food secure. This is akin to a poverty line used in poverty measurement. For our purposes we set $e = 0$, which means we consider a person answering any

question on the CFSM in the affirmative as marginally food insecure.[4] The difference here though is that as s_i increases the severity of insecurity increases. Moreover, the superscript α takes on significance as to how much weight to give to those with higher scores of s_i. The poverty measurement literature refers to α as the "poverty aversion index," but in the context here we refer to it as the "food insecurity aversion index" (Gundersen 2008; Foster, Greer, and Thorbecke 1984). The idea is that as α increases we give increasing weight in the measure to those persons further below the food security threshold, e. To wit, if $\alpha = 0$ then we end up with our dummy variable models of the previous sections; if $\alpha = 1$ then we have the food insecurity gap (depth); and if $\alpha = 2$ we have the squared food insecurity gap (severity).

Figure 15 depicts trends in the depth (food insecurity gap in Figure 15) and severity (squared food insecurity gap in Figure 15) of food insecurity separately for those without grandchildren present and those with grandchildren living in the household. It is clear that the depth of food insecurity is considerably higher (and more volatile) among multigenerational households, though after relative stability in the first half of the decade the depth among those with no grandchildren increased considerably such that the overall increase from 2001 to 2010 was 46 percent compared to 42 percent increase among multigenerational households. Interestingly there is less similarity in the severity of food insecurity, as it increased by 48 percent with no grandkids present and 64 percent with grandchildren. Common to both groups is that the depth and severity of food insecurity increased considerably since 2007.

[4] Because a person responding in the affirmative to more than two questions on the CFSM is deemed food insecure, another option is to set $e = 2.5$ so that persons with s_i values of 0, 1, or 2are food secure, and those with values of 3 or more are insecure.

Figure 15. Trends in the Depth and Severity of Food Insecurity



In Table 15 we report the results of ordinary least squares (OLS) regressions of equation (1) where we replace the dummy dependent variables of marginal food insecurity, food insecurity, and very low food security with the food insecurity gap (f^1) and squared food insecurity gap (f^2). The findings in Table 15 for the sample of households without grandchildren show that the depth of food insecurity is higher for those who are African-American, Hispanics, high school dropouts, widowed/divorced/separated, younger, living below half the poverty line, renters, the disabled, the unemployed, and those living in metro areas. Unlike the dichotomous model results in Tables 11-13, there is no evidence that marriage is protective relative to never-married adults against the depth of food insecurity.

Table 15. Estimated Determinants of the Depth and Severity of Marginal Food Insecurity among Adults Age 40+

	Food Insecurity Gap		Squared Food Insecurity Gap	
	No Grandchild	Grandchildren Present	No Grandchild	Grandchildren Present
Constant	0.182***	0.141***	0.141***	0.069***
	(0.006)	(0.014)	(0.007)	(0.009)
African American	0.017***	0.013***	0.011***	0.007***
	(0.002)	(0.004)	(0.002)	(0.002)
Other Race	-0.001	0.006	-0.000	0.004
	(0.002)	(0.006)	(0.002)	(0.004)
Hispanic	0.008***	-0.003	0.005***	-0.002
	(0.002)	(0.004)	(0.002)	(0.002)
High School	-0.008***	-0.008**	-0.003*	-0.003
	(0.001)	(0.004)	(0.001)	(0.002)
Some College	-0.006***	-0.003	-0.001	0.000
	(0.002)	(0.005)	(0.002)	(0.003)
College	-0.017***	0.001	-0.009***	0.004
	(0.001)	(0.006)	(0.001)	(0.003)
Married	-0.001	0.002	0.003*	-0.001
	(0.001)	(0.007)	(0.001)	(0.004)
Widowed	0.005***	0.011	0.005***	0.001
	(0.002)	(0.008)	(0.002)	(0.005)
Divorced/Separated	0.022***	0.013	0.019***	0.003
	(0.002)	(0.008)	(0.002)	(0.005)
Age 45-49	-0.003**	-0.002	-0.003**	-0.003
	(0.001)	(0.006)	(0.002)	(0.004)
Age50-54	-0.009***	-0.006	-0.009***	-0.005
	(0.001)	(0.006)	(0.001)	(0.004)
Age 55-59	-0.018***	-0.006	-0.017***	-0.005
	(0.001)	(0.006)	(0.001)	(0.004)
Age 60-64	-0.022***	-0.010*	-0.021***	-0.006
	(0.001)	(0.006)	(0.001)	(0.004)
Age 65-69	-0.028***	-0.017***	-0.025***	-0.010**
	(0.001)	(0.007)	(0.001)	(0.004)
Age 70-74	-0.032***	-0.022***	-0.028***	-0.013***
	(0.002)	(0.007)	(0.001)	(0.004)
Age 75-79	-0.038***	-0.014*	-0.032***	-0.008
	(0.002)	(0.009)	(0.001)	(0.005)
Age 80+	-0.045***	-0.017*	-0.037***	-0.009
	(0.002)	(0.010)	(0.002)	(0.006)
50-100% Poverty	-0.034***	-0.035***	-0.034***	-0.019***
	(0.006)	(0.011)	(0.007)	(0.007)
100-200% Poverty	-0.082***	-0.070***	-0.073***	-0.037***
	(0.005)	(0.011)	(0.006)	(0.007)
>200% Poverty	-0.127***	-0.101***	-0.106***	-0.049***
	(0.005)	(0.010)	(0.006)	(0.007)
Missing Income	-0.121***	-0.089***	-0.101***	-0.043***

	(0.005)	(0.011)	(0.006)	(0.007)
Homeowner	-0.034***	-0.031***	-0.025***	-0.015***
	(0.001)	(0.005)	(0.001)	(0.003)
Non-Metro	-0.004***	-0.009***	-0.003***	-0.004**
	(0.001)	(0.003)	(0.001)	(0.002)
Retired	0.002**	0.001	0.003***	0.001
	(0.001)	(0.004)	(0.001)	(0.002)
Unemployed	0.059***	0.033***	0.044***	0.015**
	(0.004)	(0.010)	(0.004)	(0.006)
Disabled	0.035***	0.014***	0.026***	0.004*
	(0.002)	(0.004)	(0.002)	(0.002)
Female	-0.001	-0.001	-0.000	-0.001
	(0.001)	(0.003)	(0.001)	(0.002)
South	-0.001	-0.001	-0.001	-0.003
	(0.001)	(0.004)	(0.001)	(0.002)
West	-0.000	0.002	0.001	0.000
	(0.001)	(0.004)	(0.001)	(0.003)
Northeast	-0.003***	-0.008*	-0.000	-0.006**
	(0.001)	(0.005)	(0.001)	(0.003)
Wald Test	216.73		598.32	
dof, p-value	[31,0.00]		[31,0.00]	
Observations	252803	10299	252803	10299

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Again we see important distinctions for those households with grandchildren present. The evidence of a declining age gradient in the depth of food insecurity among multigenerational households does not emerge until the householder is age 65 or older. Moreover, Hispanics are no different than non-Hispanics in terms of the severity of food insecurity, and African American seniors are not substantially more exposed than white seniors. We also see that neither higher education (some college and college) nor marriage provide extra protection against food insecurity compared to high school dropouts and never married seniors, respectively. The formal Wald test rejects the hypothesis that the coefficients are the same between multigenerational households and those with no grandchildren present with a p-value of < 0.000 for both models. Combined the results present a picture of demographic risk factors that differ substantively between multigenerational households and those households with no grandchildren present.

IV. Discussion

Using data from the 2001-2010 Core Food Security Module in the Current Population Survey we find that rates of food insecurity in households with a grandchild present are at least twice as high in a typical year, and the depth of hunger increased substantially faster among these households over the past decade. In our multivariate regression analyses we find some important distinctions between households without a grandchild present and those with a grandchild present. First, the evidence of a declining age gradient among multigenerational households is weak compared to those with no grandchildren present. This suggests that the presence of grandchildren exacerbates anxiety about having sufficient resources to eat regardless of birth cohort. Second, the "disadvantage" of certain demographic characteristics is less pronounced when a grandchild is present. For example, being an African American increases the probability of marginal food insecurity by over 40 percent from the baseline mean of 14.9 percent for households with no grandchildren present, but this effect is just 16 percent when grandchildren are present. Third, the "advantage" of certain economic factors is more prevalent among households with grandchildren, most notable of these is the strong protective effect of having incomes above the poverty line and especially over twice the line. At the same time, other protective factors such as marriage and higher education do not mediate against the depth of food insecurity among multigenerational households. Even still, simulations of our model show that a hypothetical senior (defined as a senior who is white, retired, married, living in a metropolitan region, over the age of 80, and college educated) with a grandchild living in the home and family income above twice the poverty line is at equal or greater risk of food insecurity than a similar senior with no grandchild in the household but whose income is below half the poverty line.

We conclude with two suggestions for policies regarding how to address the challenge of food insecurity among households with both grandparents and grandchildren present. First, we stress the importance of the Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp Program) in alleviating food insecurity across the lifespan. Insofar as this is the only program that is targeted towards both seniors and children, encouraging participation for grandparents raising grandchildren is especially important, especially in light of the low participation rates among some segments of the population. Second, reauthorization of the Older Americans Act is slated for this Congress and the scale of food insecurity across family structure identified in this report suggests that enhanced funding is needed to support outreach and direct services to these vulnerable households.

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Appendix Table 1.
Food Insecurity Questions in the Core Food Security Module

1. "We worried whether our food would run out before we got money to buy more." Was that **often, sometimes**, or never true for you in the last 12 months?
2. "The food that we bought just didn't last and we didn't have money to get more." Was that **often, sometimes**, or never true for you in the last 12 months?
3. "We couldn't afford to eat balanced meals." Was that **often, sometimes**, or never true for you in the last 12 months?
4. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that **often, sometimes**, or never true for you in the last 12 months?
5. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (**Yes**/No)
6. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that **often, sometimes**, or never true for you in the last 12 months?
7. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (**Yes**/No)
8. (If yes to Question 5) How often did this happen—**almost every month, some months but not every month**, or in only 1 or 2 months?
9. "The children were not eating enough because we just couldn't afford enough food." Was that **often, sometimes**, or never true for you in the last 12 months?
10. In the last 12 months, were you ever hungry, but didn't eat, because you couldn't afford enough food? (**Yes**/No)
11. In the last 12 months, did you lose weight because you didn't have enough money for food? (**Yes**/No)
12. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (**Yes**/No)
13. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (**Yes**/No)
14. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (**Yes**/No)
15. (If yes to Question 13) How often did this happen—**almost every month, some months but not every month**, or in only 1 or 2 months?
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (**Yes**/No)
17. (If yes to Question 16) How often did this happen—**almost every month, some months but not every month**, or in only 1 or 2 months?
18. In the last 12 months did any of the children ever not eat for a whole day because there wasn't enough money for food? (**Yes**/No)

Notes: Responses in bold indicate an affirmative response.