

# **The Health Consequences of Senior Hunger in the United States: Evidence from the 1999-2010 NHANES**

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## Executive Summary

Millions of seniors are food insecure in the United States, meaning that scores do not have access to enough food at all times for an active, healthy life. What makes food insecurity an even more pressing issue is its association with a wide array of negative nutrition and health consequences. In our earlier reports on food insecurity among seniors (Ziliak et al., 2008; Ziliak and Gundersen, 2011) we documented that food insecure seniors, even after controlling for other factors, were at higher risk of experiencing negative nutrition and health consequences than food secure seniors.

In this report we build on those earlier findings in three main directions. Namely, we add in several new health outcomes; we use four more years of data ; and we examine how trends in health and nutrition outcomes among food secure and food insecure seniors have changed over the past decade. Using data from the 1999-2010 National Health and Nutrition Examination Survey (NHANES), we considered the following outcomes related to nutrient intakes: energy intake, protein, vitamin A, vitamin C, thiamin, riboflavin, vitamin B6, calcium, phosphorous, magnesium, and iron. The set of health outcomes we analyzed were diabetes, general health , depression, diabetes, ADL limitations, high blood pressure, high cholesterol, congestive heart failure, coronary heart disease, cancer, reports of chest pain, gum disease, psoriasis, asthma, having had a heart attack, and a self-report of gum health. Here we summarize some of our principal findings.

*Food insecure seniors have lower nutrient intakes.* For each of the eleven nutrients, average intakes are statistically significantly lower generally by 10-20 percent for food insecure seniors in comparison to food secure seniors. After controlling for other confounding factors, the effect of food insecurity is still negative for each of the nutrients albeit in some of the cases, the effect is statistically insignificant. These differences in health outcomes held across time.

*Food insecure seniors have worse health outcomes.* For a wide array of health outcomes, food insecure seniors are worse-off than food secure seniors. Namely, they are 50 percent more likely to be diabetic, twice as likely to report fair or poor general health, three times more likely to suffer from depression, 30 percent more likely to report at least one ADL limitation, 14 percent more likely to have high blood pressure, nearly 60 percent more likely to have congestive heart failure or experienced a heart attack, and twice as likely to report having gum disease or have asthma. These differences were present in both the aggregate and for each four-year time period we examined. And, with the exception of gum disease, these worse outcomes hold even after controlling for other factors, though attenuated in magnitude.

*The effect of food insecurity holds even for a lower-income sample.* As shown in Ziliak and Gundersen (2013), food insecurity rates are substantially higher for those with incomes less than 200% of the poverty line. So, we investigated whether or not the negative association of food insecurity with nutrient intakes and health remain even when we limit our multivariate analyses to those with incomes below 200% of the poverty line. We find that, in the main, the substantive and statistical significance of the results are quite similar to those for the full sample. This further demonstrates the importance of looking at food insecurity as an independent predictor of negative health and nutrition outcomes, even among lower-income seniors.

## I. Introduction

Food insecurity has been associated with a wide array of negative health outcomes both among the young and old. Among children and working-age adults, recent research has shown that households suffering from food insecurity are more likely to incur higher risks of some birth defects (Carmichael et al., 2007), anemia (Eicher-Miller et al., 2009; Skalicky et al., 2006), lower nutrient intakes (Cook et al., 2004), greater cognitive problems (Howard, 2011), higher levels of aggression and anxiety (Whitaker et al., 2006), higher probabilities of being hospitalized (Cook et al., 2006), poorer general health (Cook et al., 2006; Gundersen and Kreider, 2009), higher probabilities of asthma (Kirkpatrick et al., 2010), higher probabilities of behavioral problems (Huang et al., 2010), and more instances of oral health problems (Muirhead et al., 2009). Among adults some of the consequences of food insecurity include lower nutrient intakes (Kirkpatrick and Tarasuk, 2007; McIntyre et al., 2003), mental health problems (Heflin et al., 2005), physical health problems (Tarasuk, 2001), depression (Whitaker et al., 2006), diabetes (Seligman et al., 2007), and higher levels of chronic disease (Seligman et al., 2009). In Ziliak, et al. (2008) and Ziliak and Gundersen (2011) we established that food insecurity has serious consequences for seniors, even controlling for other known health risks. These reports are consistent with other work that has found that food insecurity (or similar measures of food hardship) are associated with negative health outcomes (e.g., Bhargava et al. (2012), Champagne et al. (2007); Holben et al. (2006), Kim and Frongillo (2007), Klesges et al. (2001), Lee and Frongillo (2001), Sattler and Lee (2012), Sharkey (2003)).

In this report, we build on this research in three main directions. First, we consider a much wider array of health outcomes in addition to nutrient intakes including high blood

pressure, high cholesterol, congestive heart failure, coronary heart disease, heart attack, cancer, chest pain, gum disease, ratings of gum health, psoriasis, and asthma. Second, we add four more years of data. By looking at 1999-2010 data from the National Health and Nutritional Examination Survey (NHANES), we are able to utilize a larger-sample size which is especially relevant for some demographic groups, and in particular examining whether substantive health consequences hold for a low-income subsample. Third, building on the additional data, we now can examine trends in nutrition and health outcomes across food security status for the entire first decade of the 21<sup>st</sup> Century. As shown in Ziliak and Gundersen (2013), the rates of food insecurity among seniors has increased dramatically over the past decade, and in this report we are the first to document whether there are attendant health consequences.

## **II. Data**

The NHANES, conducted by the National Center for Health Statistics, Centers for Disease Control (NCHS/CDC), is a program of studies designed to assess the health and nutritional status of adults and children in the United States through interviews and focused physical examinations. The survey now examines a nationally representative sample of about 5,000 persons each year, about half of whom are adults. The interview includes demographic, socioeconomic, dietary, and health-related questions and health assessments consisting of medical and dental examinations, physiological measurements and laboratory tests. Vulnerable groups, including persons over 60, are oversampled in the NHANES to produce more reliable statistics. We use weights constructed by NHANES that are applicable for samples pooled across years. The data in the NHANES is constructed such that two years' worth of data are combined to form one wave. So, when we present the results in the tables below, the results are combined into 1999-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, and 2009-2010.

For the analyses here, we use data from multiple NHANES modules. Of particular importance to the analyses here is, of course, the presence of the full Core Food Security Module (CFSM) on the food security supplement. In this study, to make things comparable to the central analytical framework in our report on food insecurity (Ziliak and Gundersen, 2013), we compare seniors in *food insecure* households with seniors in *food secure* households. Consistent with the official definitions, a senior is in the former category if the household responds affirmatively to three or more questions from the CFSM and in the latter category if the household responds affirmatively to two or fewer questions.

For nutrient intakes we consider variables measuring energy intake, protein, vitamin A, vitamin C, thiamin, riboflavin, vitamin B6, calcium, phosphorous, magnesium, and iron. These are all based on individual's self-reports of their food consumption for two full days.

For health outcomes, we include individuals' self-reports of various outcomes. These are asked of all respondents over the age of 60. Some of the questions are based on whether or not a medical health professional has ever told someone they have a certain medical condition. This is the case for diabetes, high blood pressure, high cholesterol, congestive heart failure, coronary heart disease, heart attack cancer, asthma, gum disease, and psoriasis.<sup>1</sup> Other reports are from the respondent's own perception of current well-being including reports of chest pain, general health (excellent, very good, good, fair, or poor), depression, and whether or not someone can do activities of daily living. In addition, we include a variable for whether or not someone has ever had a heart attack and a self-report of gum health (from excellent to poor).<sup>2</sup>

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<sup>1</sup> Some of these outcomes could have been far in the past (e.g., a cancer diagnosis) and/or no longer impairing someone's current well-being (e.g., a respondent whose blood cholesterol is now lower). In addition, there may be some persons who currently or in the past have had some of these conditions but because they did not see a health professional, they are unaware of the health issue.

<sup>2</sup> For each question, the respondent has the choice to not respond or answer "don't know".

### III. Results

In this section we begin with descriptive associations between food insecurity and health outcomes for the full sample of all individuals using the updated NHANES dataset, and examine descriptive differences in nutrition and health outcomes across several demographic categories. We then more formally model the relationship between food insecurity and health with multivariate regression models.

#### III.A. Health Outcomes across Food Security Status

In Table 1A we display the mean values of our key nutrition outcomes broken down by food insecurity status. All of the analyses, except for the multivariate models, use weights supplied in the NHANES.

Intakes are lower for each nutrient for food insecure seniors in comparison to food secure seniors, and these differences can be quite large.<sup>3</sup> Consider four measures of nutrient intake for seniors that are especially important for seniors—energy intake, protein, calcium, and iron. Out of these nutrients, food insecure seniors have intakes that are 11.4 percent, 11.9 percent, 10.0 percent, and 13.7 percent lower than food secure seniors, respectively.

When we consider broader measures of health outcomes (Table 1B), a similar story emerges for most outcomes. In terms of self-reports of general health, individuals experiencing food insecurity are worse-off. For example, 38 percent of food secure individuals report excellent or very good health versus 12 percent of food insecure individuals, and 73 percent of food secure individuals report excellent, very good, or good health versus 45 percent for food insecure individuals. Rates of depression among food insecure seniors are markedly higher (233 percent) than among food secure seniors. Alongside these worse outcomes, food insecure

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<sup>3</sup> Unless otherwise noted, the differences discussed are statistically significant with p-values less than 0.05. For the results in Table 1, the p-values are all less than 0.01 with the exception of iron which is less than 0.05.

seniors are 32 percent more likely to suffer from at least one ADL limitation, 57 percent more likely to report congestive heart failure, twice as likely to report asthma, and are more 60 percent likely to have had a heart attack. Food insecure seniors also report worse gum health. The only dimension where food secure seniors are worse off than food insecure seniors is with respect to cancer where 23 percent of food secure seniors have had cancer versus 13 percent of food insecure seniors.<sup>4</sup>

### **III.B. Health Outcomes over Time and Food Security Status**

We now consider whether the relationship between food insecurity and nutrition and health outcomes change over time. This may be especially relevant if there were changes in the relative relationships over time due to the Great Recession when rates of food insecurity soared over 30 percent (Ziliak and Gundersen 2013). For these figures, we concentrate on select nutrients and for health outcomes which show statistically significant differences when averaged over all the years. When we examine food secure households, the large sample sizes allow one to examine individual waves. However, the relatively small sample sizes for food insecure households means that to derive more reliable measures of change over time, we pool two waves worth of data. So, to that end, in what follows we examine three points in time – 1999-2002, 2003-2006, and 2007-2010.

In Figures 1 through 4 we present time series trends for four nutrient intake measures: total energy, protein, calcium, and iron. Consistent with the pooled cross-sectional averages in Table 1, food insecure seniors have lower intakes of each of these measures in every time period examined compared to food secure seniors but there are differences in patterns over time. For total energy and especially for iron, the gap between food secure and food insecure seniors

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<sup>4</sup> The question regarding cancer is not regarding whether or not someone currently has cancer but, rather, whether someone has ever had cancer.



narrows somewhat over time. For protein and iron, the gap is smaller in 2003-6 than the other time periods.

In Figures 5 through 12 we display results for the some of the health outcomes in Table 1B. The outcomes we consider are diabetes, depression, ADL limitations, high blood pressure, congestive heart failure, ever having a heart attack, chest pain, and asthma.<sup>5</sup> For each of the three time periods for all the variables, the health outcomes of food insecure seniors are worse than food secure seniors. For most of the health outcomes, the levels for both food insecure and food secure seniors remained relatively constant throughout and, consequently, so too did the gap between the groups. The exceptions were for chest pain which, while the gap remained similar, there was a steady decline for both groups and for diabetes and congestive heart failure the gap increased over the middle time period. Even though food insecurity rates increased dramatically after the Great Recession, for most of the health outcomes considered the gaps between food secure and food insecure did not worsen.

### **III.C Demographic Differences in Health Outcomes across Food Security Status**

In Tables 2 through 18 we present the results for demographic groups in the NHANES for which there were at least 500 observations. These tables are further broken down by nutrient intakes (A) and health outcomes (B), but not by year owing to small of sample sizes by demographic group.<sup>6</sup> The groups were selected on the basis of the results in Ziliak, et al. (2008) and Ziliak and Gundersen (2013) that showed that certain subpopulations of seniors were at greater risk of food insecurity, e.g. by income, race, and education.

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<sup>5</sup> Questions on the conditions of one's gums differed from year-to-year and so we do not examine changes over time. The questions on general health only were asked in 2001 and subsequent years so we do not include this variable, either.

<sup>6</sup> As noted in the previous footnote, questions on the conditions of one's gums differed from year-to-year. One implication is that there is not a large enough sample size for the two variables related to gum health when things are broken down by demographic categories. A similar story holds for psoriasis.

With respect to marital status, food secure and food insecure seniors who are married or widowed have significantly different nutrient intakes for each of the 11 measures with few exceptions (Tables 2A and 3A). In contrast, in the other marital category (not married; not widowed) food insecure seniors have similar intakes (Table 4A). In general, like for the full population, food insecure seniors across marital status have worse health outcomes over the dimensions discussed above than food secure seniors. But there are exceptions. Married seniors who are food insecure, in comparison to food secure married seniors, are less likely to have had a heart attack and more likely to have had cancer (Table 2B). With the exception of diabetes and general health, widowed food insecure and food secure seniors have similar health outcomes (Table 3B) and, consistent with this, while still statistically significantly higher, food secure widows have more diminished differences with food insecure seniors than for the full population. Table 4B for those not married or widowed is quite similar in terms of differences to Table 1B.

Turning to income, for seniors with incomes below 200% of the poverty line differences between food secure and food insecure seniors in terms of nutrient intakes are more muted but still statistically significant for all the nutrients except riboflavin, calcium, and phosphorous (Table 5A). For health outcomes, the differences are similar in terms of statistically significant differences (with the exception of excellent versus other levels of general health, congestive heart failure, and having a heart attack) but the differences are again more muted (Table 5B). Comparisons by food security status for those with incomes above 200% of the poverty line are similar to the full population (Tables 6A and 6B). It is noteworthy that across nearly all nutrient categories the food secure living below 200 percent of poverty have lower intakes than the food insecure living above 200 percent of poverty, but in terms of general health the two groups are more comparable.

Tables 7A and 7B are for female seniors. The results are similar to the population as a whole for both nutrient intakes and health outcomes. A similar story holds for male seniors (Tables 8A and 8B). There are qualitative gender differences in nutrient intakes across food security status, but those differences are less pronounced among general health outcomes.

For African-American seniors, the nutrient intakes are qualitatively lower among the food insecure, but are statistically significantly different only for thiamin, Vitamin B6, and magnesium (Table 9A). For health outcomes, there are no statistically significant differences for being in excellent health, high blood pressure, cancer, or gum health; the other outcomes are qualitatively similar to the full population (Table 9B). For Hispanics, with the exception of Vitamin C, there are no statistical differences in nutrient intakes by food insecurity status (Table 10A) and, with the exception of general health, ADL limitations, and chest pain, there are no substantive or statistical differences in health outcomes by food insecurity status (Table 10B). As expected, when the sample is restricted to senior whites, the results are similar to the full population (Tables 11A and 11B).

Turning to education status, food insecure and food secure seniors with a high school degree have similar nutrient intakes with the exception of Vitamin C (Table 12A). For health outcomes, food insecure seniors with a high school degree are worse-off with similar patterns as found for the full population results with the exception of diabetes and high blood pressure which are now statistically insignificant (Table 12B). For seniors who did not graduate from high school, the results are similar to the full population with the exception of high blood pressure which is statistically insignificant (Tables 13A and 13B). Again, like we saw earlier with the 200 percent of poverty sample, the nutrient intakes of food secure high school dropouts

are lower than the food insecure sample with high school and beyond, and the health outcomes broadly similar with some exceptions such as reports of depression.

Finally, we consider differences between food insecure and food secure seniors by age: 60-65 years old, 66-70, 71-75, 76-80, and 81 or more (Tables 14A, 14B, 15A, 15B, 16A, 16B, 17A, 17B, 18A, 18B). For younger seniors the results largely mimic those of the full population of seniors seen in Tables 1A and 1B. For the youngest seniors, there are some additional variables that are statistically significantly different by food insecurity status - high cholesterol, and coronary heart disease. Moreover, the gaps between food insecure and food secure seniors in this age group are substantially larger for many of the outcomes. For the oldest seniors, the differences in health outcomes by food insecurity status remain but, in many cases, the differences are not statistically significant and, in general, the differences are more muted, even when statistically significant.

#### **III.D. The Association of Food Insecurity with Nutrition and Health Outcomes**

We now turn to our analysis of the effect of food insecurity on health outcomes when we control for other known risk factors which may also influence health outcomes. As with the previous tables and figures, we estimate these models using data from the 1999-2010 NHANES. Formally, we estimate the following model for the determinants of health outcomes (OUT) as:

$$OUT_{ij} = f_j(FI_i, \mathbf{X}_i)$$

where  $i$  denotes a senior;  $j$  denotes either a nutrient intake or health condition;  $FI$  is equal to 1 if a senior is in a food insecure household, 0 otherwise; and  $\mathbf{X}_i$  is a vector of household demographic and economic factors and wave fixed effects. For continuous measures, we estimate this using OLS and for binary measures, probit model. For the probit results we report the marginal effects

evaluated at the means rather than the coefficients, which do not have a ready quantitative interpretation.

As seen in Table 19A, even after controlling for other factors, food insecurity has a substantive and statistically significant negative association with the intakes of energy, protein, vitamin C, thiamin, riboflavin, vitamin B6, magnesium, and iron. For example, controlling for other confounding factors, energy intake among food insecure seniors is 74 kcal lower, which is about 4 percent lower than the average intake among food secure. A similar quantitative effect holds for protein intakes, while the 7.5 mg lower Vitamin C is 8 percent lower than the mean in Table 1A among food secure. These effects are about one-half the size reported in the unadjusted means of Table 1A, indicating that the other half owes to differences in income, education, race, marital status, and age between food secure and food insecure seniors. That is, when significant, the other variables in our models have the expected association with health outcomes. For example, for energy, intakes are higher among seniors with more income<sup>7</sup>, males, non-Hispanic whites, high school graduates, and younger seniors. The differences between the bivariate results in Table 1A, where all of the differences between food insecure and food secure seniors were statistically significant, and those here demonstrate the importance of controlling for other factors when estimating the impact of food insecurity.

With respect to health outcomes, the association of food insecurity with health outcomes is also generally consistent with the results of Table 1B. As seen in the first page of Table 19B, for each of the health outcomes with the exception of diabetes and the narrowest general health

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<sup>7</sup> In the NHANES, income is only reported within bounds. (E.g., between \$5,001 and \$10,000.) NHANES then translates this information into a ratio of income to the poverty line. A small number of Seniors reported incomes of less than \$20,000 or more than \$20,000 rather than the more narrow bounds. In these cases, NHANES did not assign a ratio of income to the poverty line. Because we do not want to delete these observations from our samples, we assign these households an income-to-poverty level value of the averages within the groups reporting their incomes within the more narrow bounds.

comparison (excellent versus very good, good, fair, or poor health), food insecurity has a negative association with positive health outcomes and a positive association with negative health outcomes. And, in many cases, the effects are especially large when compared with other covariates. For example, being food insecure, in terms of its association with ADL limitations is roughly equivalent to being 14 years older. In the second page of Table 19B, like in Table 1B, high blood pressure, congestive heart failure, and heart attack are all negatively associated with food insecurity. However, coronary heart disease, after controlling for other factors, has a not unexpected association with food insecurity. Finally, in the third page of Table 19B, chest pain, gum health, and asthma are all directly associated with food insecurity. In contrast, the result in Table 1B that food insecure seniors have lower probabilities of cancer in comparison to food secure seniors disappears once we control for other factors.

As we pointed out in Ziliak et al. (2008) and Ziliak and Gundersen (2011), unlike for nutrient intakes, the causality is not as clear with these relationships. For example, someone suffering from ADL limitations may be less able to get to the store to purchase food in comparison with someone who is readily able to perform such daily functions as bathing, eating, and dressing. Nevertheless, the associations in the tables discussed above are, in general, in the anticipated directions.

The rates of food insecurity among lower-income seniors are far higher than those with higher incomes. As seen in Table 1 in Ziliak and Gundersen (2013), 27.7 percent of seniors with incomes below the poverty line are food insecure and 16.2 percent of seniors with incomes between the poverty line and 200% of the poverty line are food insecure. In contrast, the food insecurity rate for seniors with incomes above 200% of the poverty line is 6.6 percent. We

therefore now consider whether the associations of food insecurity with health outcomes are still present when we restrict the sample to those at greater risk of food insecurity.

Table 20A shows the results for the nutrient intakes covered above. In 19A, food insecurity, after controlling for relevant covariates, is negatively associated with energy, protein, vitamin C, thiamin, riboflavin, vitamin B6, magnesium, and iron. In Table 20A food insecurity continues to be statistically significant in all of these except riboflavin. And, phosphorous is statistically significant in this low-income sample even though it was not in the full sample.

In Table 20B, we consider the associations of food insecurity with health outcomes for the lower-income sample. In comparison to Table 19B, the association of food insecurity with the health outcomes are, as expected, more muted. The patterns of statistical significance are the same as the full sample with the exception of excellent health versus very good, good, fair, or poor health which is now statistically insignificant. In the second page of Table 20B, the association of food insecurity with high blood pressure, congestive heart failure, and heart attack are all positive and statistically significant. Finally, the third page of Table 20B shows that food insecurity is positively and statistically significantly associated with chest pain and asthma, just like in the full sample.

#### **IV. Conclusions**

In these concluding remarks we emphasize four major findings from our analyses of the NHANES from 1999 through 2010. First, we find that food insecure seniors are on average worse off than food secure seniors for each nutritional outcome and most health measures we analyze. These gaps in well-being have remained generally constant over the past decade, even though rates of food insecurity accelerated. Second, the general pattern that food insecure seniors are worse-off with respect to health and nutrition outcomes than food secure seniors

holds even when we restrict our samples to distinct demographic categories. To put this a different way, there are no common demographic groups which are immune to the negative impacts of food insecurity. Third, we find that the disadvantage facing food insecure seniors with respect to health outcomes persists even controlling for other known risk factors for poor health. This further reinforces the need to look at food insecurity as a policy-relevant measure, independent of other measures of well-being (e.g., income). Fourth, further buttressing the previous point, even when the sample is restricted to those with lower incomes, food insecurity still is associated with worse nutrition and health outcomes.



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**Table 1A.** Nutrition Outcomes by Food Insecurity Status for Seniors, Full Sample

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1787.72	1583.66**
Protein (gm)	69.74	61.45**
Vitamin A (mcg)	661.13	541.30**
Vitamin C (mg)	89.47	67.38**
Thiamin (mg)	1.50	1.29**
Riboflavin (mg)	2.03	1.77**
Vitamin B6 (mg)	1.80	1.48**
Calcium (mg)	801.83	721.41**
Phosphorous (mg)	1165.35	1035.23**
Magnesium (mg)	268.86	231.42**
Iron (mg)	14.60	12.60**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 1B. Health Outcomes by Food Insecurity Status for Seniors, Full Sample**

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.17	0.26**
Self-Reports of General Health		
Excellent	0.10	0.03**
Excellent or very good	0.38	0.12**
Excellent, very good, or good	0.73	0.45**
Suffers from depression	0.03	0.10**
At least one ADL limitation	0.65	0.86**
High blood pressure	0.56	0.64**
High cholesterol	0.54	0.57
Congestive heart failure	0.07	0.11*
Coronary heart disease	0.11	0.11
Heart attack	0.10	0.16**
Cancer	0.23	0.13**
Reports of chest pain	0.32	0.43**
Gum disease	0.11	0.22*
Gum health? (1-excellent 5-poor)	2.69	3.45**
Psoriasis	0.04	0.03
Asthma	0.11	0.21**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 2A. Health Nutrients by Food Insecurity Status for Seniors, Sample of married**

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1866.77	1627.20**
Protein (gm)	73.22	62.46**
Vitamin A (mcg)	659.10	502.08**
Vitamin C (mg)	91.51	64.33**
Thiamin (mg)	1.56	1.35**
Riboflavin (mg)	2.10	1.77**
Vitamin B6 (mg)	1.87	1.51**
Calcium (mg)	828.10	724.63
Phosphorous (mg)	1222.22	1052.82**
Magnesium (mg)	281.50	235.71**
Iron (mg)	15.21	13.17**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 2B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of married

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.16	0.26**
Self-Reports of General Health		
Excellent	0.11	0.04**
Excellent or very good	0.42	0.15**
Excellent, very good, or good	0.77	0.47**
Suffers from depression	0.03	0.06*
At least one ADL limitation	0.61	0.82*
High blood pressure	0.54	0.65**
High cholesterol	0.54	0.53
Congestive heart failure	0.06	0.10
Coronary heart disease	0.11	0.11
Heart attack	0.14	0.09*
Cancer	0.11	0.23**
Reports of chest pain	0.31	0.44**
Gum disease	0.10	0.24*
Gum health? (1-excellent 5-poor)	2.60	3.61**
Psoriasis	0.04	0.03
Asthma	0.10	0.17**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 3A.** Nutrients by Food Insecurity Status for Seniors, Sample of widowed

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1593.49	1365.46**
Protein (gm)	61.83	53.93**
Vitamin A (mcg)	668.04	517.15**
Vitamin C (mg)	85.75	67.23**
Thiamin (mg)	1.36	1.15**
Riboflavin (mg)	1.86	1.56**
Vitamin B6 (mg)	1.65	1.26**
Calcium (mg)	735.45	652.94*
Phosphorous (mg)	1034.77	913.60**
Magnesium (mg)	236.43	200.54**
Iron (mg)	13.29	10.51**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .



**Table 3B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of widowed

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.17	0.27**
Self-Reports of General Health		
Excellent	0.06	0.03
Excellent or very good	0.31	0.10**
Excellent, very good, or good	0.66	0.45**
Suffers from depression	0.03	0.12**
At least one ADL limitation	0.74	0.90**
High blood pressure	0.61	0.68
High cholesterol	0.53	0.55
Congestive heart failure	0.10	0.13
Coronary heart disease	0.11	0.09
Heart attack	0.11	0.15
Cancer	0.18	0.23
Reports of chest pain	0.53	0.55
Asthma	0.11	0.09

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 4A.** Nutrients by Food Insecurity Status for Seniors, Sample of not married or widowed

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1767.45	1716.70
Protein (gm)	68.02	66.45
Vitamin A (mcg)	659.08	607.11
Vitamin C (mg)	85.17	70.98*
Thiamin (mg)	1.47	1.36
Riboflavin (mg)	2.02	1.96
Vitamin B6 (mg)	1.73	1.62
Calcium (mg)	793.57	779.28
Phosphorous (mg)	1134.35	1118.17
Magnesium (mg)	266.49	252.67
Iron (mg)	13.91	13.67

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 4B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of not married or widowed

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.17	0.24*
Self-Reports of General Health		
Excellent	0.10	0.03**
Excellent or very good	0.35	0.10**
Excellent, very good, or good	0.68	0.43**
Suffers from depression	0.04	0.14**
At least one ADL limitation	0.65	0.87**
High blood pressure	0.53	0.61
High cholesterol	0.55	0.63
Congestive heart failure	0.06	0.11*
Coronary heart disease	0.08	0.13
Heart attack	0.08	0.17**
Cancer	0.20	0.11**
Reports of chest pain	0.31	0.43**
Asthma	0.13	0.27**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 5A.** Nutrition Outcomes by Food Insecurity Status for Seniors, Sample Below 200% of Poverty Line

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1647.23	1555.08*
Protein (gm)	63.60	60.38*
Vitamin A (mcg)	612.35	538.71*
Vitamin C (mg)	78.11	70.29*
Thiamin (mg)	1.38	1.29*
Riboflavin (mg)	1.87	1.74
Vitamin B6 (mg)	1.60	1.46*
Calcium (mg)	727.67	703.13
Phosphorous (mg)	1060.62	1010.44
Magnesium (mg)	240.57	224.47*
Iron (mg)	13.41	12.42*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$

**Table 5B.** Health Outcomes by Food Insecurity Status for Seniors, Sample Below 200% of Poverty Line

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.20	0.28*
Self-Reports of General Health		
Excellent	0.05	0.03
Excellent or very good	0.26	0.12**
Excellent, very good, or good	0.61	0.44**
Suffers from depression	0.04	0.10**
At least one ADL limitation	0.73	0.86**
High blood pressure	0.58	0.67**
High cholesterol	0.53	0.57
Congestive heart failure	0.09	0.12
Coronary heart disease	0.11	0.12
Heart attack	0.13	0.16
Cancer	0.20	0.15**
Reports of chest pain	0.35	0.45**
Asthma	0.12	0.22**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses . \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$

**Table 6A.** Nutrients by Food Insecurity Status for Seniors, Sample of 200% of poverty line or more

	Food Secure	Food Insecure
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	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1853.68	1693.37*
Protein (gm)	72.62	65.57*
Vitamin A (mcg)	683.04	551.69*
Vitamin C (mg)	94.81	56.19**
Thiamin (mg)	1.56	1.31**
Riboflavin (mg)	2.10	1.88
Vitamin B6 (mg)	1.89	1.55*
Calcium (mg)	836.65	791.58
Phosphorous (mg)	1214.52	1130.41
Magnesium (mg)	282.15	258.11
Iron (mg)	15.16	13.29*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 6B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of 200% of poverty line or more

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.15	0.19
Self-Reports of General Health		
Excellent	0.12	0.03**
Excellent or very good	0.44	0.12**
Excellent, very good, or good	0.79	0.49**
Suffers from depression	0.02	0.12*
At least one ADL limitation	0.61	0.85**
High blood pressure	0.54	0.55
High cholesterol	0.54	0.57
Congestive heart failure	0.06	0.10
Coronary heart disease	0.10	0.07
Heart attack	0.08	0.14
Cancer	0.24	0.08**
Reports of chest pain	0.30	0.36
Asthma	0.10	0.18*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 7A. Nutrients by Food Insecurity Status for Seniors, Sample of female**

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1573.24	1433.22**
Protein (gm)	60.70	55.61**
Vitamin A (mcg)	622.51	533.51*
Vitamin C (mg)	85.11	65.54**
Thiamin (mg)	1.33	1.16**
Riboflavin (mg)	1.81	1.59**
Vitamin B6 (mg)	1.59	1.33**
Calcium (mg)	741.79	651.06**
Phosphorous (mg)	1032.76	938.21**
Magnesium (mg)	241.86	212.00**
Iron (mg)	12.96	11.18**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .



**Table 7B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of female

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.16	0.26**
Self-Reports of General Health		
Excellent	0.08	0.03**
Excellent or very good	0.37	0.11**
Excellent, very good, or good	0.72	0.42**
Suffers from depression	0.04	0.13**
At least one ADL limitation	0.71	0.88**
High blood pressure	0.58	0.66**
High cholesterol	0.54	0.59
Congestive heart failure	0.06	0.10*
Coronary heart disease	0.06	0.09
Heart attack	0.06	0.11**
Cancer	0.21	0.15**
Reports of chest pain	0.32	0.44**
Asthma	0.12	0.26**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 8A.** Nutrients by Food Insecurity Status for Seniors, Sample of male

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	2057.74	1818.54**
Protein (gm)	81.12	70.57**
Vitamin A (mcg)	709.57	554.02**
Vitamin C (mg)	94.97	70.24**
Thiamin (mg)	1.72	1.51**
Riboflavin (mg)	2.31	2.06*
Vitamin B6 (mg)	2.07	1.71**
Calcium (mg)	877.42	831.25
Phosphorous (mg)	1332.28	1186.71**
Magnesium (mg)	302.86	261.74**
Iron (mg)	16.66	14.80*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 8B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of male

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.18	0.25*
Self-Reports of General Health		
Excellent	0.11	0.04**
Excellent or very good	0.40	0.14**
Excellent, very good, or good	0.75	0.51**
Suffers from depression	0.02	0.07**
At least one ADL limitation	0.58	0.82**
High blood pressure	0.53	0.62**
High cholesterol	0.53	0.52
Congestive heart failure	0.08	0.13*
Coronary heart disease	0.16	0.15
Heart attack	0.14	0.23**
Cancer	0.25	0.11**
Reports of chest pain	0.30	0.42**
Asthma	0.09	0.14*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 9A.** Nutrients by Food Insecurity Status for Seniors, Sample of black

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1600.59	1523.48
Protein (gm)	63.69	60.09
Vitamin A (mcg)	618.30	530.84
Vitamin C (mg)	87.07	76.09
Thiamin (mg)	1.26	1.16*
Riboflavin (mg)	1.54	1.43
Vitamin B6 (mg)	1.53	1.34**
Calcium (mg)	601.83	575.90
Phosphorous (mg)	951.53	895.14
Magnesium (mg)	218.53	198.35*
Iron (mg)	12.18	11.35

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 9B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of black

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.29	0.32
Self-Reports of General Health		
Excellent	0.05	0.05
Excellent or very good	0.21	0.11**
Excellent, very good, or good	0.58	0.41**
Suffers from depression	0.04	0.05
At least one ADL limitation	0.66	0.83**
High blood pressure	0.73	0.72
High cholesterol	0.50	0.58
Congestive heart failure	0.09	0.08
Coronary heart disease	0.05	0.10*
Heart attack	0.08	0.16**
Cancer	0.14	0.11
Reports of chest pain	0.32	0.40*
Asthma	0.11	0.20**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 10A. Nutrients by Food Insecurity Status for Seniors, Sample of Hispanic**

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1644.57	1544.28
Protein (gm)	65.52	61.49
Vitamin A (mcg)	549.62	488.62
Vitamin C (mg)	84.41	69.83*
Thiamin (mg)	1.31	1.23
Riboflavin (mg)	1.71	1.55*
Vitamin B6 (mg)	1.59	1.45
Calcium (mg)	720.80	693.73
Phosphorous (mg)	1073.82	1014.01
Magnesium (mg)	250.21	237.98
Iron (mg)	12.75	12.20

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 10B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of Hispanic

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.24	0.26
Self-Reports of General Health		
Excellent	0.07	0.03**
Excellent or very good	0.20	0.09**
Excellent, very good, or good	0.52	0.33**
Suffers from depression	0.05	0.08
At least one ADL limitation	0.63	0.80**
High blood pressure	0.53	0.58
High cholesterol	0.53	0.46
Congestive heart failure	0.06	0.09
Coronary heart disease	0.07	0.07
Heart attack	0.06	0.08
Cancer	0.09	0.08
Reports of chest pain	0.27	0.42**
Asthma	0.11	0.16

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 11A.** Nutrients by Food Insecurity Status for Seniors, Sample of white

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1821.32	1646.22**
Protein (gm)	70.70	62.79**
Vitamin A (mcg)	675.75	575.99*
Vitamin C (mg)	89.40	64.38**
Thiamin (mg)	1.54	1.38**
Riboflavin (mg)	2.11	2.08
Vitamin B6 (mg)	1.84	1.56**
Calcium (mg)	832.19	801.37
Phosphorous (mg)	1196.02	1119.45
Magnesium (mg)	274.49	240.06**
Iron (mg)	14.97	13.39*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .



**Table 11B. Health Outcomes by Food Insecurity Status for Seniors, Sample of white**

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.15	0.23**
Self-Reports of General Health		
Excellent	0.10	0.03**
Excellent or very good	0.42	0.14**
Excellent, very good, or good	0.77	0.51**
Suffers from depression	0.03	0.15**
At least one ADL limitation	0.65	0.90**
High blood pressure	0.54	0.65**
High cholesterol	0.54	0.61
Congestive heart failure	0.07	0.13*
Coronary heart disease	0.11	0.12
Heart attack	0.10	0.21**
Cancer	0.25	0.17*
Reports of chest pain	0.32	0.45**
Asthma	0.10	0.24**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 12A.** Nutrients by Food Insecurity Status for Seniors, Sample of high school graduate

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1834.35	1749.05
Protein (gm)	71.56	67.04
Vitamin A (mcg)	680.62	628.11
Vitamin C (mg)	90.98	70.71**
Thiamin (mg)	1.53	1.47
Riboflavin (mg)	2.11	2.09
Vitamin B6 (mg)	1.86	1.73
Calcium (mg)	843.47	861.64
Phosphorous (mg)	1204.40	1178.36
Magnesium (mg)	278.39	270.31
Iron (mg)	14.90	14.48

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

<b>Table 12B. Health Outcomes by Food Insecurity Status for Seniors, Sample of high school graduate</b>		
	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.15	0.18
Self-Reports of General Health		
Excellent	0.11	0.05**
Excellent or very good	0.44	0.15**
Excellent, very good, or good	0.78	0.59**
Suffers from depression	0.03	0.13**
At least one ADL limitation	0.63	0.84**
High blood pressure	0.55	0.60
High cholesterol	0.55	0.57
Congestive heart failure	0.06	0.11*
Coronary heart disease	0.10	0.08
Heart attack	0.11	0.09
Cancer	0.24	0.15**
Reports of chest pain	0.30	0.40*
Asthma	0.10	0.25**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 13A.** Nutrients by Food Insecurity Status for Seniors, Sample of non-high school graduate

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1656.08	1453.45**
Protein (gm)	64.54	56.37**
Vitamin A (mcg)	597.22	476.55**
Vitamin C (mg)	72.52	63.65*
Thiamin (mg)	1.41	1.16**
Riboflavin (mg)	1.92	1.58**
Vitamin B6 (mg)	1.64	1.26**
Calcium (mg)	728.89	639.76**
Phosphorous (mg)	1067.08	932.92**
Magnesium (mg)	236.28	199.87**
Iron (mg)	13.45	10.93**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 13B. Health Outcomes by Food Insecurity Status for Seniors, Sample of non-high school graduate**

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.22	0.33**
Self-Reports of General Health		
Excellent	0.05	0.02**
Excellent or very good	0.22	0.10**
Excellent, very good, or good	0.57	0.35**
Suffers from depression	0.04	0.08*
At least one ADL limitation	0.74	0.86**
High blood pressure	0.61	0.69**
High cholesterol	0.53	0.57
Congestive heart failure	0.11	0.13
Coronary heart disease	0.12	0.13
Heart attack	0.12	0.17*
Cancer	0.20	0.12**
Reports of chest pain	0.32	0.44**
Asthma	0.10	0.19**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 14A.** Nutrients by Food Insecurity Status for Seniors, Sample of between 60 and 65 years of age

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1943.73	1696.63**
Protein (gm)	75.95	66.13**
Vitamin A (mcg)	635.94	556.43
Vitamin C (mg)	89.74	68.79**
Thiamin (mg)	1.56	1.35**
Riboflavin (mg)	2.10	1.90
Vitamin B6 (mg)	1.84	1.60**
Calcium (mg)	841.14	722.88*
Phosphorous (mg)	1249.29	1082.59**
Magnesium (mg)	286.07	243.57**
Iron (mg)	14.93	13.25*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 14B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of between 60 and 65 years of age

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.16	0.23*
Self-Reports of General Health		
Excellent	0.12	0.03**
Excellent or very good	0.43	0.10**
Excellent, very good, or good	0.78	0.45**
Suffers from depression	0.03	0.12**
At least one ADL limitation	0.55	0.83**
High blood pressure	0.49	0.59*
High cholesterol	0.53	0.65**
Congestive heart failure	0.04	0.09*
Coronary heart disease	0.07	0.14*
Heart attack	0.06	0.16**
Cancer	0.15	0.08**
Reports of chest pain	0.30	0.47**
Asthma	0.12	0.24**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 15A.** Nutrients by Food Insecurity Status for Seniors, Sample of between 66 and 70 years of age

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1859.66	1551.61
Protein (gm)	73.06	59.77
Vitamin A (mcg)	676.93	529.02*
Vitamin C (mg)	94.16	65.68**
Thiamin (mg)	1.54	1.25**
Riboflavin (mg)	2.07	1.73**
Vitamin B6 (mg)	1.85	1.46**
Calcium (mg)	806.57	725.78
Phosphorous (mg)	1204.26	1034.64**
Magnesium (mg)	280.49	229.60**
Iron (mg)	15.10	12.49**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .



**Table 15B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of between 66 and 70 years of age

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.17	0.35**
Self-Reports of General Health		
Excellent	0.11	0.05*
Excellent or very good	0.42	0.12**
Excellent, very good, or good	0.77	0.39**
Suffers from depression	0.03	0.10*
At least one ADL limitation	0.59	0.81**
High blood pressure	0.55	0.68
High cholesterol	0.59	0.48
Congestive heart failure	0.06	0.09
Coronary heart disease	0.10	0.10
Heart attack	0.09	0.10
Cancer	0.21	0.15
Reports of chest pain	0.31	0.38
Asthma	0.11	0.23**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 16A.** Nutrients by Food Insecurity Status for Seniors, Sample of between 71 and 75 years of age

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1724.99	1496.20**
Protein (gm)	68.10	59.55**
Vitamin A (mcg)	670.81	488.16**
Vitamin C (mg)	86.76	64.25**
Thiamin (mg)	1.48	1.21**
Riboflavin (mg)	2.01	1.66**
Vitamin B6 (mg)	1.79	1.28**
Calcium (mg)	789.13	719.07
Phosphorous (mg)	1137.58	1005.45*
Magnesium (mg)	263.30	212.62**
Iron (mg)	14.43	11.81**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 16B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of between 71 and 75 years of age

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.19	0.25
Self-Reports of General Health		
Excellent	0.09	0.03*
Excellent or very good	0.36	0.14**
Excellent, very good, or good	0.72	0.46**
Suffers from depression	0.03	0.09*
At least one ADL limitation	0.68	0.93**
High blood pressure	0.61	0.72*
High cholesterol	0.56	0.61
Congestive heart failure	0.07	0.15
Coronary heart disease	0.11	0.08
Heart attack	0.09	0.16*
Cancer	0.26	0.18
Reports of chest pain	0.32	0.45*
Asthma	0.11	0.22*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 17A.** Nutrients by Food Insecurity Status for Seniors, Sample of between 76 and 80 years of age

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1611.78	1460.95**
Protein (gm)	61.88	55.23**
Vitamin A (mcg)	670.34	570.51
Vitamin C (mg)	87.53	69.14*
Thiamin (mg)	1.43	1.29
Riboflavin (mg)	1.93	1.66**
Vitamin B6 (mg)	1.73	1.41**
Calcium (mg)	765.14	715.39
Phosphorous (mg)	1066.83	962.91*
Magnesium (mg)	245.98	224.71
Iron (mg)	13.99	12.06*

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 17B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of between 76 and 80 years of age

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.16	0.21
Self-Reports of General Health		
Excellent	0.07	0.03**
Excellent or very good	0.33	0.14**
Excellent, very good, or good	0.67	0.52**
Suffers from depression	0.03	0.09*
At least one ADL limitation	0.77	0.89**
High blood pressure	0.59	0.63
High cholesterol	0.49	0.45
Congestive heart failure	0.11	0.14
Coronary heart disease	0.14	0.09*
Heart attack	0.14	0.21
Cancer	0.29	0.18**
Reports of chest pain	0.33	0.40
Asthma	0.08	0.13

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 18A.** Nutrients by Food Insecurity Status for Seniors, Sample of more than 80 years of age

	Food Secure	Food Insecure
	(1)	(2)
Nutrient intakes		
Energy Intake (kcal)	1580.39	1367.68*
Protein (gm)	60.32	54.13
Vitamin A (mcg)	689.73	507.87**
Vitamin C (mg)	89.70	81.24
Thiamin (mg)	1.41	1.15**
Riboflavin (mg)	1.88	1.53**
Vitamin B6 (mg)	1.73	1.26**
Calcium (mg)	764.40	666.66
Phosphorous (mg)	1049.61	909.01*
Magnesium (mg)	241.13	209.34*
Iron (mg)	13.86	9.86**

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 18B.** Health Outcomes by Food Insecurity Status for Seniors, Sample of more than 80 years of age

	Food Secure	Food Insecure
	(1)	(2)
Diabetic	0.16	0.23
Self-Reports of General Health		
Excellent	0.07	0.04
Excellent or very good	0.32	0.13**
Excellent, very good, or good	0.64	0.51
Suffers from depression	0.02	0.06
At least one ADL limitation	0.80	0.89*
High blood pressure	0.61	0.61
High cholesterol	0.46	0.47
Congestive heart failure	0.11	0.11
Coronary heart disease	0.13	0.05*
Heart attack	0.06	0.06
Cancer	0.30	0.13**
Reports of chest pain	0.34	0.41
Asthma	0.08	0.18

Notes: Food secure is defined as 2 or fewer affirmative responses in the Core Food Security Module; food insecure is defined as 3 or more affirmative responses. \* Different from column (1),  $p \leq 0.05$ . \*\* Different from column (1),  $p \leq 0.01$ .

**Table 19A:** Effect of Food Insecurity and Other Variables on Various Nutrient Intake Outcomes

	Energy	Protein	Vitamin A	Vitamin C	Thiamin	Riboflavin
	(1)	(2)	(3)	(4)	(5)	(6)
Food insecure	-76.899** (26.469)	-3.407** (1.178)	-55.084 (36.813)	-6.658* (3.349)	-0.088** (0.029)	-0.073 (0.039)
Not married or widowed	37.256 (20.228)	0.335 (0.900)	33.396 (27.470)	4.224 (2.560)	0.018 (0.022)	0.074* (0.030)
Widowed	48.953* (19.516)	1.475 (0.869)	52.273 (26.817)	1.571 (2.469)	0.047* (0.021)	0.091** (0.029)
Income/Poverty line	36.805** (5.536)	1.729** (0.246)	18.799* (7.573)	5.156** (0.700)	0.036** (0.006)	0.047** (0.008)
Female	-430.320** (15.198)	-17.655** (0.676)	-79.236** (20.968)	-7.215** (1.923)	-0.344** (0.017)	-0.447** (0.022)
Black	-162.943** (20.596)	-4.677** (0.917)	-23.111 (28.099)	4.451 (2.606)	-0.225** (0.022)	-0.524** (0.030)
Hispanic	-85.729** (20.497)	-0.991 (0.912)	-66.474* (28.465)	9.971** (2.594)	-0.124** (0.022)	-0.260** (0.030)
Other	-191.265** (45.174)	-3.795 (2.010)	-50.390 (61.169)	18.874** (5.716)	-0.057 (0.049)	-0.488** (0.067)
High school graduate	111.347** (17.113)	3.577** (0.762)	76.176** (23.477)	14.595** (2.165)	0.080** (0.019)	0.135** (0.025)
Age	-16.458** (1.169)	-0.660** (0.052)	1.337 (1.616)	0.289 (0.148)	-0.005** (0.001)	-0.009** (0.002)
Constant	2,959.884** (91.581)	117.253** (4.076)	506.368** (126.485)	60.922** (11.588)	1.925** (0.100)	2.580** (0.135)

Notes: Number of observations is 9422. Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.



**Table 19A(cont):** Effect of Food Insecurity and Other Variables on Various Nutrient Intake Outcomes

	VitaminB6	Calcium	Phosphorous	Magnesium	Iron
	(7)	(8)	(9)	(10)	(11)
Food insecure	-0.133** (0.043)	-1.478 (18.128)	-38.608* (19.095)	-10.005* (4.688)	-0.740* (0.305)
Not married or widowed	0.033 (0.033)	34.066* (13.854)	14.127 (14.593)	7.496* (3.583)	-0.058 (0.233)
Widowed	0.073* (0.032)	21.483 (13.366)	19.950 (14.079)	1.586 (3.457)	0.319 (0.225)
Income/Poverty line	0.073** (0.009)	24.741** (3.792)	28.926** (3.994)	9.487** (0.981)	0.372** (0.064)
Female	-0.420** (0.025)	-105.099** (10.409)	-254.768** (10.964)	-49.301** (2.692)	-3.185** (0.175)
Black	-0.222** (0.033)	-207.444** (14.106)	-209.135** (14.858)	-44.035** (3.648)	-2.259** (0.237)
Hispanic	-0.100** (0.033)	-36.381** (14.038)	-26.341 (14.787)	1.935 (3.631)	-1.052** (0.236)
Other	-0.143* (0.073)	-160.164** (30.939)	-142.555** (32.588)	8.830 (8.001)	-0.716 (0.521)
High school graduate	0.153** (0.028)	56.984** (11.721)	69.313** (12.345)	25.888** (3.031)	0.962** (0.197)
Age	-0.002 (0.002)	-2.333** (0.801)	-8.300** (0.843)	-1.428** (0.207)	-0.033* (0.013)
Constant	1.889** (0.148)	850.065** (62.723)	1,732.671** (66.066)	352.097** (16.221)	17.408** (1.056)

Notes: Number of observations is 9422. Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.

**Table 19B:** Effect of Food Insecurity and Other Variables on Various Health Outcomes

	Diabetic	Excellent	Excellent or very good	Excellent, very good, or good	Depression	ADL limitations
	(1)	(2)	(3)	(4)	(5)	(6)
Food insecure	0.009 (0.014)	-0.008 (0.011)	-0.083** (0.019)	-0.084** (0.020)	0.018* (0.007)	0.142** (0.015)
Not married or widowed	-0.030** (0.010)	0.000 (0.007)	-0.014 (0.014)	-0.051** (0.015)	0.013* (0.006)	0.017 (0.013)
Widowed	-0.003 (0.011)	-0.011 (0.007)	-0.037** (0.013)	-0.058** (0.015)	0.006 (0.005)	0.019 (0.013)
Income/Poverty line	-0.020** (0.003)	0.015** (0.002)	0.041** (0.004)	0.047** (0.004)	-0.009** (0.001)	-0.033** (0.004)
Female	-0.013 (0.008)	-0.011 (0.006)	-0.005 (0.011)	-0.002 (0.011)	0.016** (0.004)	0.096** (0.010)
Black	0.122** (0.013)	-0.020** (0.007)	-0.117** (0.012)	-0.109** (0.016)	-0.009 (0.005)	-0.035* (0.014)
Hispanic	0.084** (0.012)	-0.014* (0.007)	-0.140** (0.012)	-0.161** (0.016)	0.005 (0.005)	-0.052** (0.014)
Other	0.073** (0.028)	-0.027* (0.012)	-0.102** (0.024)	-0.110** (0.033)	-0.003 (0.010)	-0.036 (0.030)
High school graduate	-0.032** (0.009)	0.029** (0.006)	0.109** (0.011)	0.139** (0.012)	0.007 (0.004)	-0.037** (0.011)
Age	-0.002** (0.001)	-0.001* (0.000)	-0.002 (0.001)	-0.003** (0.001)	-0.001* (0.000)	0.010** (0.001)
N	10625	8702	8702	8702	10625	10625

Notes: Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.

**Table 19B(cont):** Effect of Food Insecurity and Other Variables on Various Health Outcomes

	High Blood Pressure	High Cholesterol	Congestive Heart Failure	Coronary Heart Disease	Heart Attack
	(7)	(8)	(9)	(10)	(11)
Food insecure	0.033 (0.018)	-0.006 (0.021)	0.028** (0.011)	0.024 (0.013)	0.053** (0.013)
Not married or widowed	-0.017 (0.014)	-0.004 (0.015)	-0.002 (0.007)	-0.021** (0.008)	0.007 (0.009)
Widowed	0.001 (0.014)	-0.013 (0.015)	0.029** (0.007)	0.009 (0.008)	0.022** (0.008)
Income/Poverty line	-0.009* (0.004)	-0.007 (0.004)	-0.011** (0.002)	-0.003 (0.002)	-0.013** (0.002)
Female	0.063** (0.011)	0.037** (0.012)	-0.034** (0.006)	-0.078** (0.006)	-0.084** (0.006)
Black	0.179** (0.013)	-0.032* (0.016)	0.002 (0.007)	-0.054** (0.007)	-0.030** (0.007)
Hispanic	-0.016 (0.014)	-0.019 (0.016)	-0.029** (0.006)	-0.046** (0.007)	-0.054** (0.006)
Other	0.024 (0.030)	-0.045 (0.033)	-0.020 (0.013)	-0.014 (0.016)	-0.040** (0.013)
High school graduate	-0.000 (0.012)	0.013 (0.013)	-0.012 (0.006)	-0.005 (0.007)	0.001 (0.007)
Age	0.005** (0.001)	-0.005** (0.001)	0.003** (0.000)	0.002** (0.000)	0.003** (0.000)
N	10625	10625	10625	10625	10625

Notes: Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.

**Table 19B(cont):** Effect of Food Insecurity and Other Variables on Various Health Outcomes

	Cancer	Chest pain	Gum Disease	Gum Health (1- excellent 5-poor)	Psoriasis	Asthma
	(12)	(13)	(14)	(15)	(16)	(17)
Food insecure	0.004 (0.016)	0.118** (0.018)	0.016 (0.028)	0.133 (0.095)	-0.004 (0.012)	0.057** (0.013)
Not married or widowed	-0.004 (0.011)	0.003 (0.013)	0.053* (0.024)	0.158* (0.073)	0.009 (0.012)	0.016 (0.009)
Widowed	-0.026** (0.010)	-0.005 (0.012)	0.020 (0.025)	0.106 (0.076)	0.022 (0.014)	-0.007 (0.008)
Income/Poverty line	0.012** (0.003)	-0.016** (0.004)	-0.010 (0.006)	-0.143** (0.020)	-0.002 (0.003)	-0.006* (0.002)
Female	-0.026** (0.008)	0.022* (0.010)	-0.021 (0.017)	-0.210** (0.057)	-0.014 (0.008)	0.040** (0.006)
Black	-0.070** (0.009)	-0.029* (0.013)	0.032 (0.025)	0.386** (0.078)	-0.031** (0.007)	-0.004 (0.008)
Hispanic	-0.127** (0.009)	-0.086** (0.012)	0.013 (0.023)	0.363** (0.079)	-0.014 (0.008)	-0.035** (0.008)
Other	-0.113** (0.014)	-0.010 (0.028)	0.058 (0.049)	0.492** (0.139)	0.007 (0.020)	0.029 (0.020)
High school graduate	0.021* (0.009)	-0.012 (0.011)	-0.003 (0.020)	-0.212** (0.067)	0.002 (0.009)	0.005 (0.007)
Age	0.008** (0.001)	-0.000 (0.001)	-0.007** (0.001)	-0.004 (0.004)	-0.001 (0.001)	-0.002** (0.000)
Constant				3.635** (0.344)		
N	8265	10298	1641	1641	1874	10302

Notes: Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.

**Table 20A:** Effect of Food Insecurity and Other Variables on Various Nutrient Intake Outcomes on population below 200% of poverty line

	Energy	Protein	Vitamin A	Vitamin C	Thiamin	Riboflavin
	(1)	(2)	(3)	(4)	(5)	(6)
Food insecure	-78.427** (29.861)	-3.708** (1.296)	-77.524 (40.381)	-8.079* (3.746)	-0.082** (0.030)	-0.075 (0.042)
Not married or widowed	60.083* (28.233)	0.750 (1.225)	13.976 (38.009)	4.813 (3.541)	0.010 (0.028)	0.130** (0.040)
Widowed	50.128 (27.868)	1.273 (1.210)	34.466 (37.847)	3.378 (3.496)	0.066* (0.028)	0.128** (0.040)
Income/Poverty line	51.172* (25.286)	1.189 (1.098)	-27.100 (34.369)	5.422 (3.172)	0.054* (0.025)	0.081* (0.036)
Female	-382.346** (22.821)	-15.670** (0.991)	-18.417 (30.989)	-5.562 (2.863)	-0.296** (0.023)	-0.389** (0.032)
Black	-145.507** (30.078)	-4.158** (1.306)	-37.519 (40.240)	7.035 (3.773)	-0.189** (0.030)	-0.522** (0.043)
Hispanic	-64.718* (28.185)	0.225 (1.223)	-40.702 (38.350)	12.062** (3.535)	-0.098** (0.028)	-0.231** (0.040)
Other	-102.003 (67.319)	2.385 (2.922)	13.569 (88.805)	27.607** (8.444)	0.062 (0.067)	-0.343** (0.095)
High school graduate	117.012** (23.159)	3.614** (1.005)	56.728 (30.927)	12.103** (2.905)	0.092** (0.023)	0.161** (0.033)
Age	-14.469** (1.762)	-0.556** (0.076)	0.757 (2.392)	-0.005 (0.221)	-0.005** (0.002)	-0.010** (0.002)
Constant	2,762.744** (137.540)	108.863** (5.970)	593.204** (186.817)	77.260** (17.252)	1.836** (0.137)	2.541** (0.195)

Notes: Number of observations is 4251. Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.

**Table 20A(cont):** Effect of Food Insecurity and Other Variables on Various Nutrient Intake Outcomes on population below 200% of poverty line

	VitaminB6	Calcium	Phosphorous	Magnesium	Iron
	(7)	(8)	(9)	(10)	(11)
Food insecure	-0.127** (0.040)	-9.497 (19.536)	-49.312* (21.203)	-13.703** (5.129)	-0.739* (0.320)
Not married or widowed	0.047 (0.038)	52.610** (18.470)	34.806 (20.047)	8.871 (4.849)	0.008 (0.303)
Widowed	0.096* (0.037)	33.390 (18.232)	23.748 (19.788)	0.684 (4.786)	0.551 (0.299)
Income/Poverty line	0.065 (0.034)	38.986* (16.542)	26.010 (17.955)	7.212 (4.343)	0.635* (0.271)
Female	-0.333** (0.031)	-85.655** (14.930)	-219.609** (16.204)	-40.053** (3.920)	-2.825** (0.245)
Black	-0.208** (0.040)	-189.213** (19.678)	-191.786** (21.358)	-37.428** (5.166)	-1.712** (0.323)
Hispanic	-0.091* (0.038)	13.191 (18.439)	9.983 (20.013)	8.351 (4.841)	-0.674* (0.302)
Other	-0.016 (0.090)	-83.136 (44.040)	-55.916 (47.800)	29.008* (11.562)	0.700 (0.722)
High school graduate	0.129** (0.031)	79.397** (15.151)	76.628** (16.444)	25.931** (3.978)	1.056** (0.248)
Age	-0.005* (0.002)	-0.929 (1.153)	-7.068** (1.251)	-1.382** (0.303)	-0.034 (0.019)
Constant	2.034** (0.184)	699.256** (89.980)	1,614.758** (97.662)	345.427** (23.623)	16.489** (1.475)

Notes: Number of observations is 4251. Standard errors are in parentheses. \* significant at 5% level; \*\* significant at 1% level.

**Table 20B:** Effect of Food Insecurity and Other Variables on Various Health Outcomes on population below 200% of poverty line

	Diabetic	Excellent	Excellent or very good	Excellent, very good, or good	Depression	ADL limitations
	(1)	(2)	(3)	(4)	(5)	(6)
Food insecure	0.025 (0.017)	-0.004 (0.009)	-0.052** (0.017)	-0.068** (0.023)	0.022* (0.009)	0.114** (0.015)
Not married or widowed	-0.041** (0.015)	0.002 (0.008)	0.004 (0.016)	-0.021 (0.021)	0.017 (0.009)	0.009 (0.016)
Widowed	-0.006 (0.016)	-0.011 (0.008)	-0.023 (0.016)	-0.014 (0.021)	0.007 (0.008)	0.021 (0.016)
Income/Poverty line	0.001 (0.014)	0.006 (0.007)	0.031* (0.015)	0.090** (0.019)	-0.017* (0.007)	-0.068** (0.015)
Female	0.011 (0.013)	-0.005 (0.007)	-0.019 (0.013)	-0.019 (0.017)	0.021** (0.006)	0.071** (0.013)
Black	0.101** (0.019)	0.001 (0.009)	-0.056** (0.015)	-0.063** (0.022)	-0.019** (0.007)	-0.031 (0.018)
Hispanic	0.071** (0.017)	-0.004 (0.008)	-0.100** (0.014)	-0.146** (0.021)	0.003 (0.008)	-0.054** (0.017)
Other	0.056 (0.040)	-0.014 (0.015)	-0.056 (0.029)	-0.048 (0.046)	-0.012 (0.014)	-0.041 (0.041)
High school graduate	-0.029* (0.013)	0.015* (0.007)	0.073** (0.013)	0.123** (0.017)	0.016* (0.007)	-0.028* (0.014)
Age	-0.003** (0.001)	0.000 (0.001)	0.002* (0.001)	-0.001 (0.001)	-0.001* (0.000)	0.008** (0.001)
N	4,879	4,075	4,075	4,075	4,879	4,879

Notes: Standard errors in parentheses \* significant at 5% level; \*\* significant at 1% level.

**Table 20B(cont):** Effect of Food Insecurity and Other Variables on Various Health Outcomes on population below 200% of poverty line

	High Blood Pressure	High Cholesterol	Congestive Heart Failure	Coronary Heart Disease	Heart Attack
	(7)	(8)	(9)	(10)	(11)
Food insecure	0.051** (0.020)	0.002 (0.024)	0.030* (0.013)	0.026 (0.013)	0.058** (0.016)
Not married or widowed	0.013 (0.019)	0.008 (0.022)	-0.007 (0.011)	-0.029** (0.010)	-0.004 (0.012)
Widowed	0.027 (0.018)	-0.000 (0.021)	0.017 (0.011)	-0.002 (0.011)	0.018 (0.012)
Income/Poverty line	-0.000 (0.017)	0.023 (0.019)	-0.015 (0.010)	-0.023* (0.010)	-0.008 (0.011)
Female	0.080** (0.015)	0.051** (0.017)	-0.028** (0.009)	-0.050** (0.009)	-0.088** (0.010)
Black	0.176** (0.018)	-0.018 (0.023)	-0.015 (0.011)	-0.060** (0.009)	-0.042** (0.011)
Hispanic	-0.034 (0.019)	-0.011 (0.021)	-0.043** (0.010)	-0.063** (0.009)	-0.082** (0.010)
Other	0.025 (0.043)	-0.001 (0.048)	-0.053** (0.015)	-0.033 (0.018)	-0.063** (0.017)
High school graduate	-0.003 (0.016)	-0.005 (0.017)	-0.003 (0.009)	-0.005 (0.009)	0.001 (0.010)
Age	0.003** (0.001)	-0.007** (0.001)	0.003** (0.001)	0.001* (0.001)	0.002** (0.001)
N	4,879	3,938	4,821	4,808	4,854

Notes: Standard errors in parentheses \* significant at 5% level; \*\* significant at 1% level.



**Table 20B(cont):** Effect of Food Insecurity and Other Variables on Various Health Outcomes

	Cancer	Chest pain	Gum Disease	Gum Health (1-excellent 5-poor)	Psoriasis	Asthma
	(12)	(13)	(14)	(15)	(16)	(17)
Food insecure	0.012 (0.016)	0.121** (0.020)	-0.010 (0.032)	0.076 (0.109)	-0.007 (0.015)	0.048** (0.014)
Not married or widowed	-0.019 (0.013)	0.005 (0.018)	0.110** (0.040)	0.111 (0.110)	0.001 (0.016)	0.022 (0.012)
Widowed	-0.031* (0.012)	0.008 (0.018)	0.012 (0.040)	0.038 (0.116)	0.005 (0.017)	-0.010 (0.011)
Income/Poverty line	0.005 (0.012)	-0.015 (0.016)	0.028 (0.032)	-0.158 (0.104)	-0.009 (0.015)	-0.011 (0.011)
Female	-0.007 (0.011)	0.031* (0.015)	-0.003 (0.028)	-0.203* (0.092)	-0.012 (0.013)	0.048** (0.009)
Black	-0.062** (0.012)	-0.052** (0.019)	0.008 (0.038)	0.308* (0.122)	-0.035** (0.010)	-0.011 (0.012)
Hispanic	-0.120** (0.011)	-0.113** (0.017)	-0.003 (0.035)	0.204 (0.115)	-0.031* (0.012)	-0.042** (0.011)
Other	-0.123** (0.013)	-0.048 (0.039)	0.118 (0.078)	0.461* (0.190)	-0.015 (0.017)	0.034 (0.029)
High school graduate	0.019 (0.011)	-0.013 (0.015)	-0.028 (0.029)	-0.250** (0.091)	0.011 (0.013)	0.007 (0.010)
Age	0.006** (0.001)	-0.003* (0.001)	-0.009** (0.002)	-0.007 (0.007)	-0.001 (0.001)	-0.002** (0.001)
Constant				4.003** (0.551)		
N	4,872	4,865	654	660	815	4,873

Notes: Standard errors in parentheses \* significant at 5% level; \*\* significant at 1% level.

Figure 1: Energy (kcal) by Food Insecurity Status for Seniors, 1999-2010

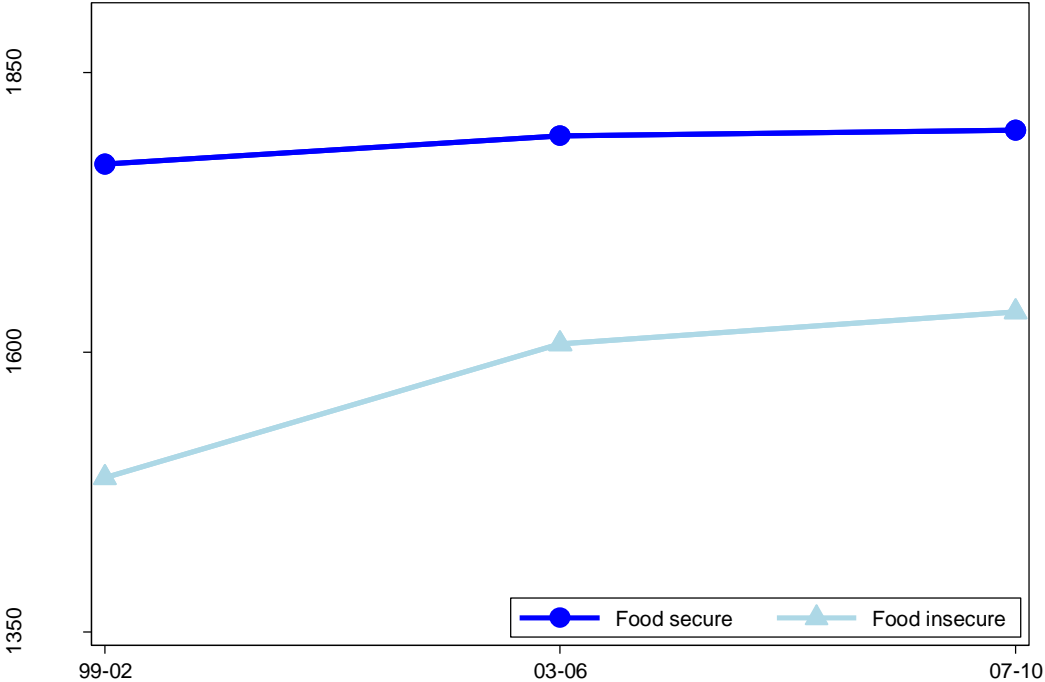


Figure 2: Protein (gm) by Food Insecurity Status for Seniors, 1999-2010

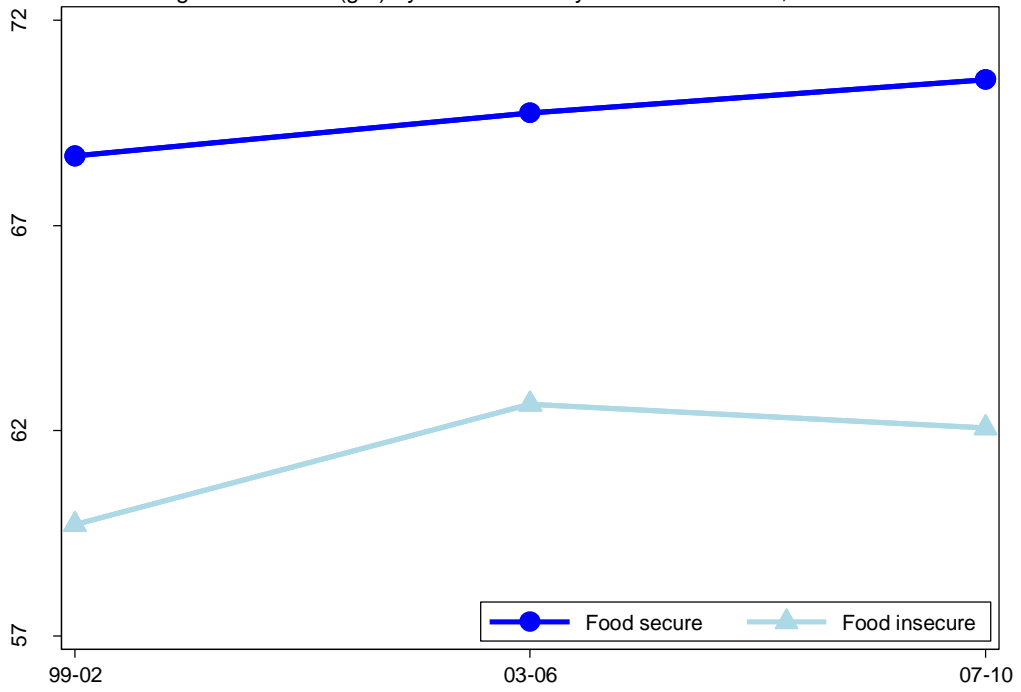


Figure 3: Calcium (mg) by Food Insecurity Status for Seniors, 1999-2010

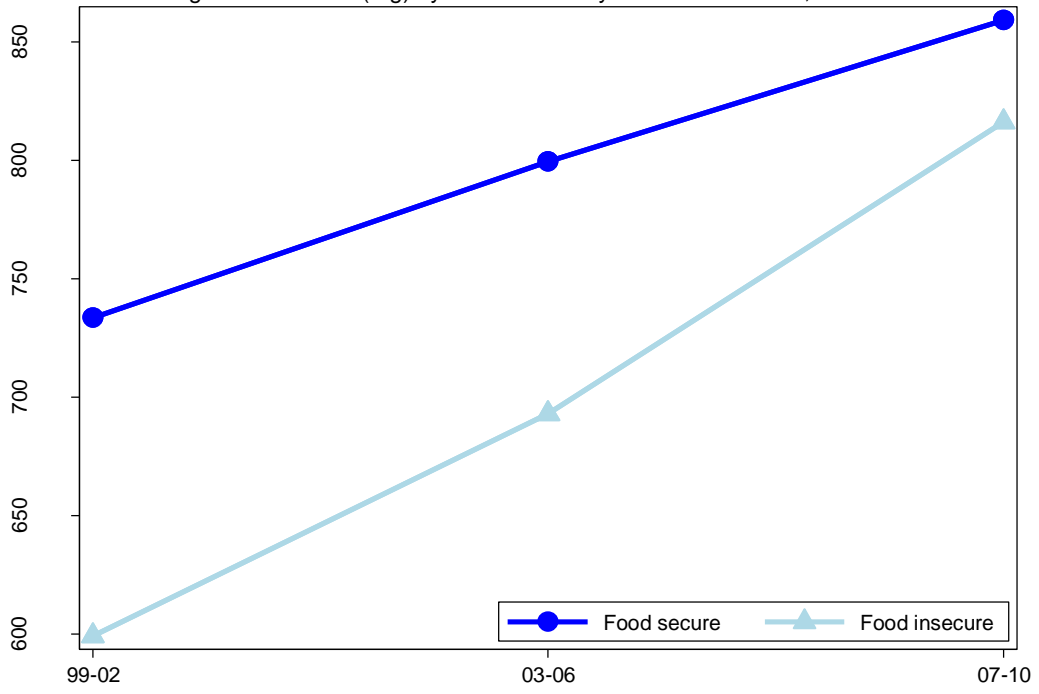


Figure 4: Iron (mg) by Food Insecurity Status for Seniors, 1999-2010

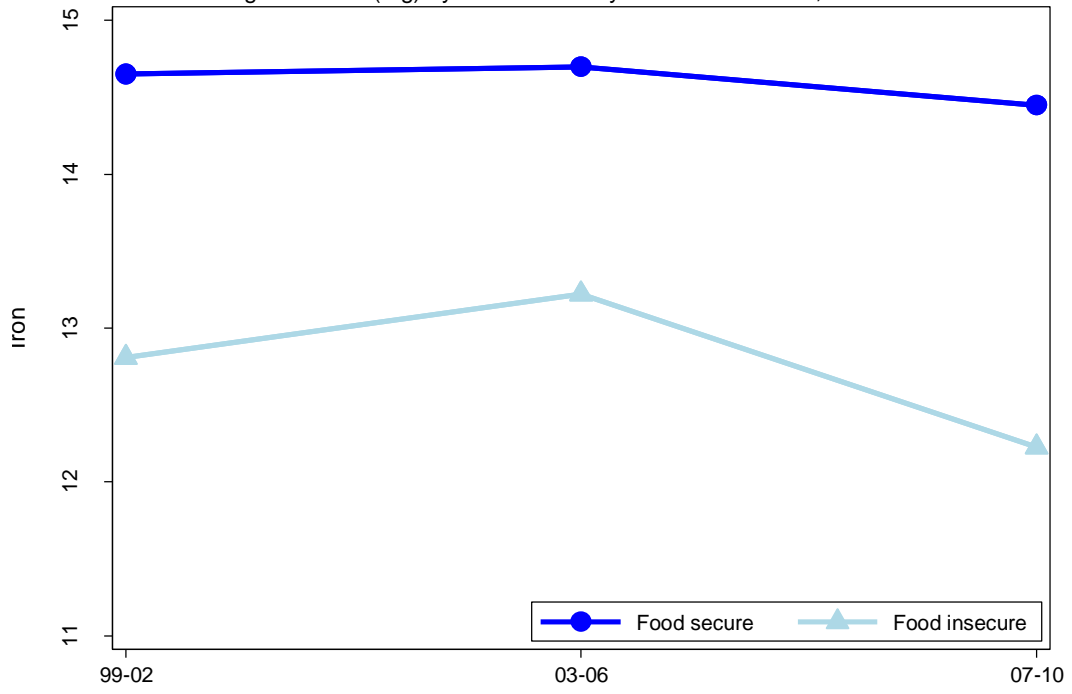


Figure 5: Diabetes Status by Food Insecurity Status for Seniors, 1999-2010

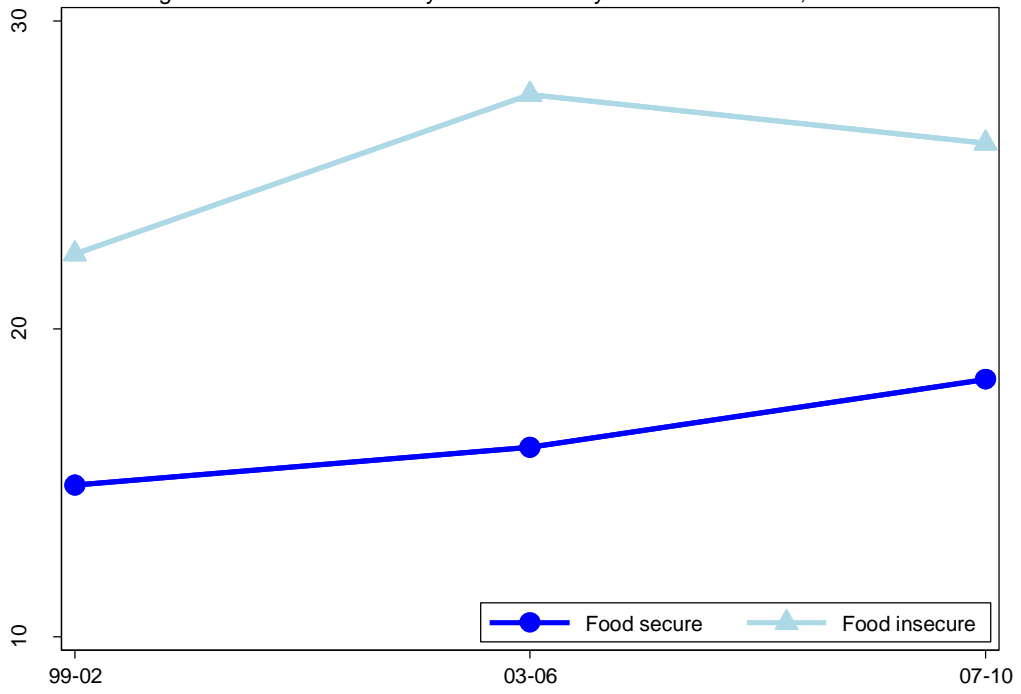


Figure 6: Suffers from Depression by Food Insecurity Status for Seniors, 1999-2010

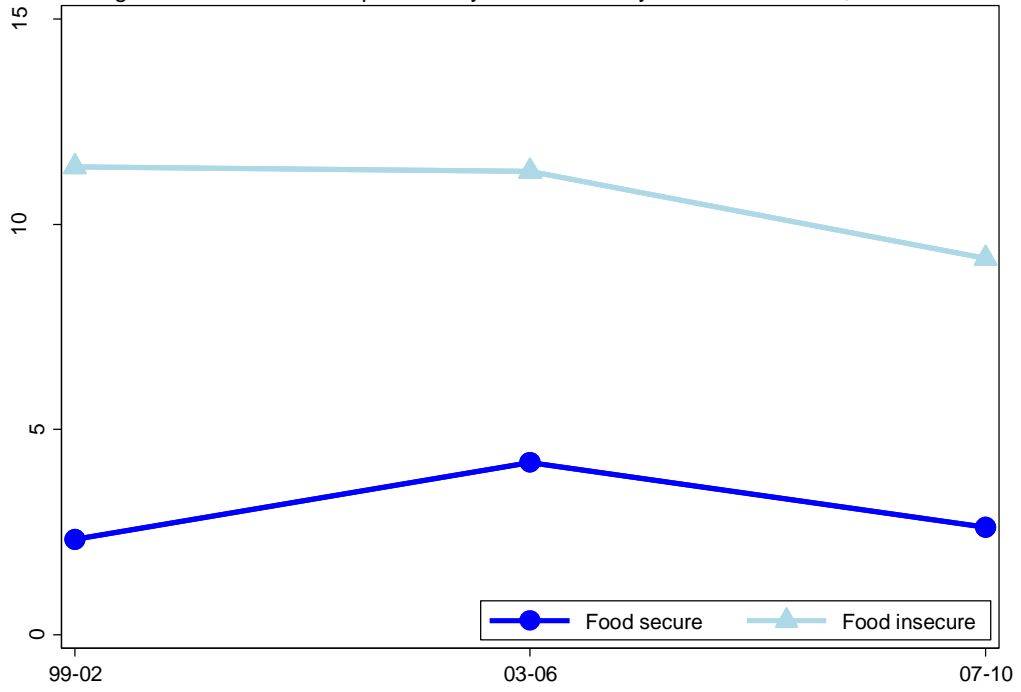


Figure 7: At least one ADL Limitation by Food Insecurity Status for Seniors, 1999-2010

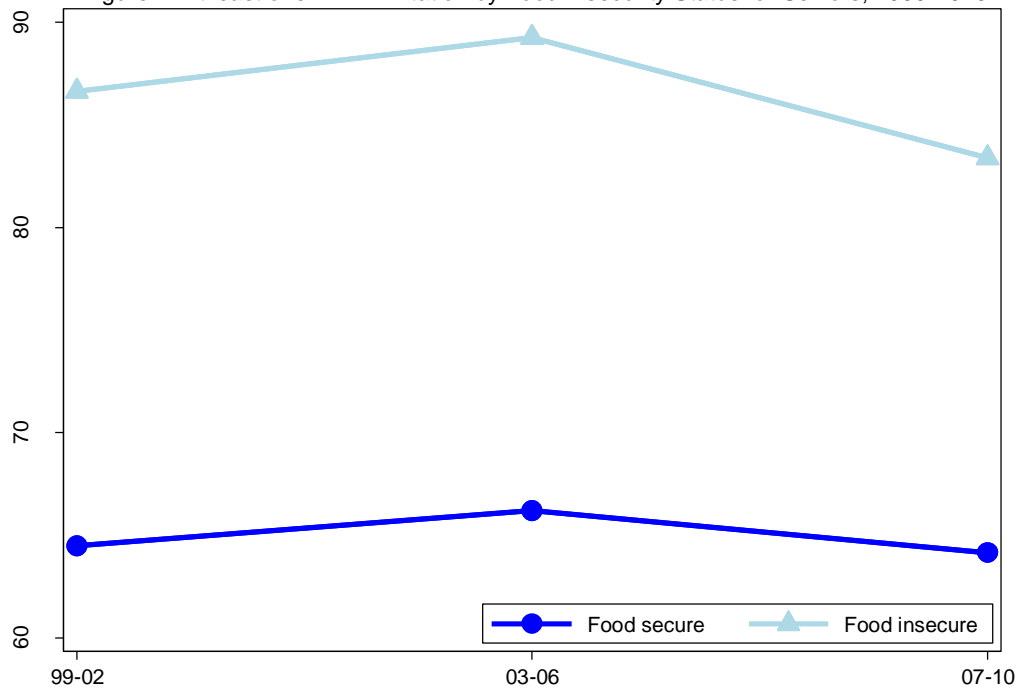
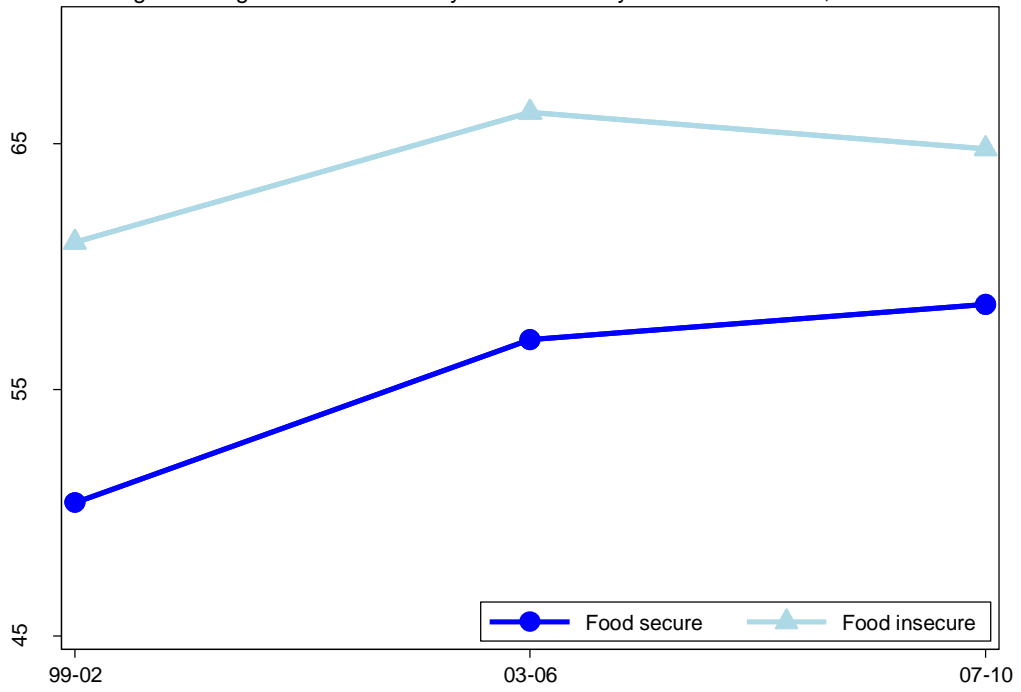




Figure 8: High Blood Pressure by Food Insecurity Status for Seniors, 1999-2010



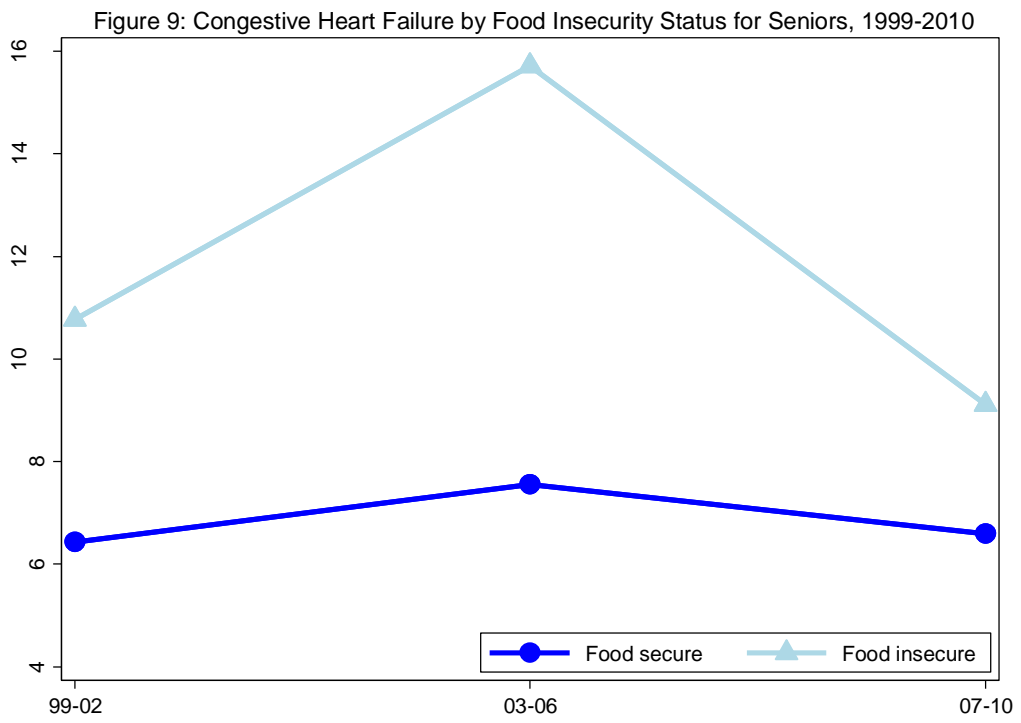


Figure 10: Heart Attack by Food Insecurity Status for Seniors, 1999-2010

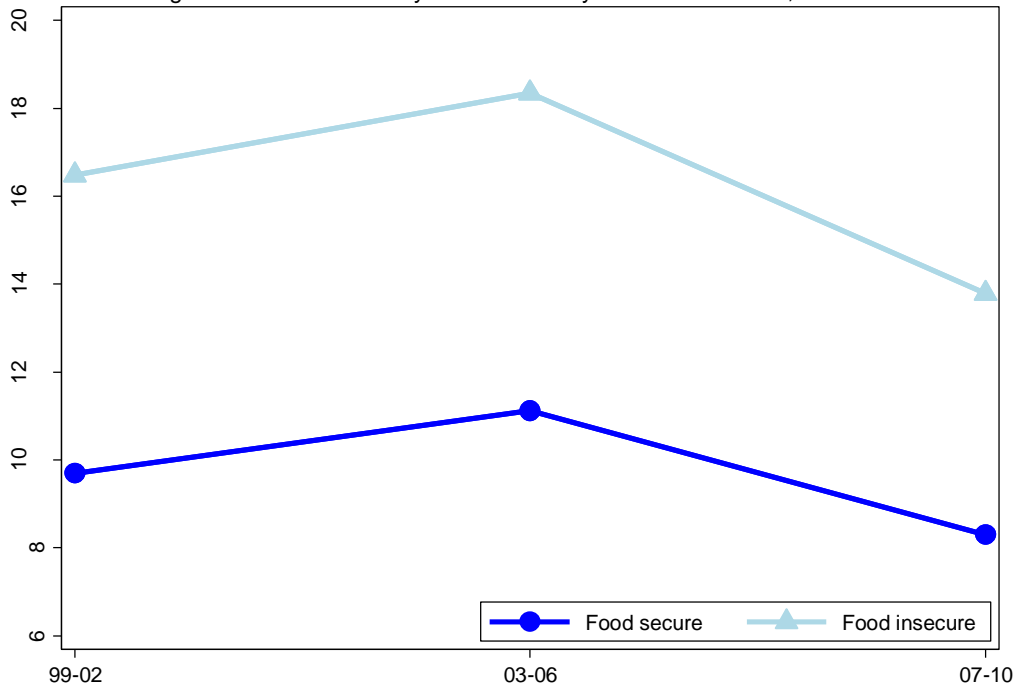


Figure 11: Chest Pain by Food Insecurity Status for Seniors, 1999-2010

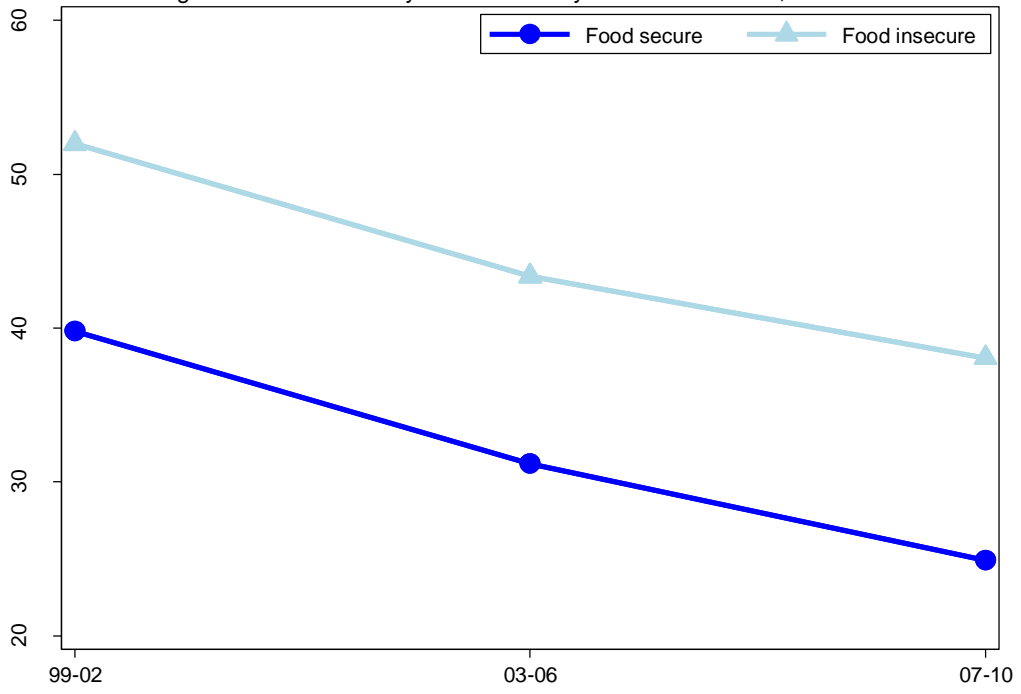
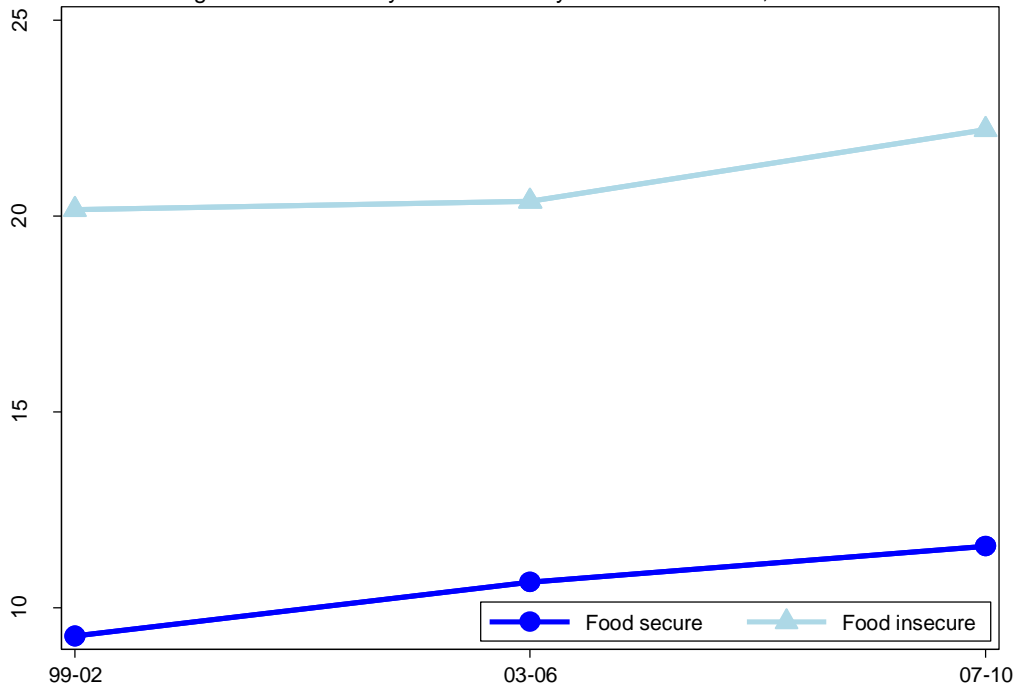


Figure 12: Asthma by Food Insecurity Status for Seniors, 1999-2010



## About the Authors

James P. Ziliak, Ph.D., holds the Carol Martin Gatton Endowed Chair in Microeconomics in the Department of Economics and is Founding Director of the Center for Poverty Research at the University of Kentucky. He earned received his BA/BS degrees in economics and sociology from Purdue University, and his Ph.D. in Economics from Indiana University. He served as assistant and associate professor of economics at the University of Oregon, and has held visiting positions at the Brookings Institution, University College London, University of Michigan, and University of Wisconsin. His research expertise is in the areas of labor economics, poverty, food insecurity, and tax and transfer policy. Recent projects include the causes and consequences of hunger among older Americans; trends in earnings and income volatility in the U.S.; trends in the antipoverty effectiveness of the social safety net; the origins of persistent poverty in America; and regional wage differentials across the earnings distribution. He is editor of *Welfare Reform and its Long Term Consequences for America's Poor* published by Cambridge University Press (2009) and *Appalachian Legacy: Economic Opportunity after the War on Poverty* published by Brookings Institution Press (2012).

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