

DISCUSSION PAPER SERIES

IZA DP No. 11445

**An Apple a Day?
Adult Food Stamp Eligibility and Health
Care Utilization Among Immigrants**

Chloe N. East
Andrew I. Friedson

MARCH 2018

DISCUSSION PAPER SERIES

IZA DP No. 11445

An Apple a Day? Adult Food Stamp Eligibility and Health Care Utilization Among Immigrants

Chloe N. East

University of Colorado Denver and IZA

Andrew I. Friedson

University of Colorado Denver

MARCH 2018

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ABSTRACT

An Apple a Day? Adult Food Stamp Eligibility and Health Care Utilization among Immigrants*

In this study, we document the effect of Food Stamp access on adult health care utilization. While Food Stamps is one of the largest safety net programs in the U.S. today, the universal nature of the program across geographic areas and over time limits the potential for quasi-experimental analysis. To circumvent this, we use variation in documented immigrants' eligibility for Food Stamps across states and over time due to welfare reform in 1996. Our estimates indicate that access to Food Stamps reduced the likelihood of an adult visiting a physician more than twice in one year, but had no significant effect on the likelihood of having any physician visits. This result does not appear to be due to changes in physical or mental health, or due to individuals with common chronic health conditions, leaving open the possibility that changes in nutrition or resources may reduce the need for physician visits. Additionally, we find that for single women, Food Stamps increased the affordability of specialty health care, which may have further reduced the need for physician visits. These findings have important implications for cost-benefit analyses of the Food Stamp program, as reductions in health care utilization due to Food Stamps may offset some of the program's impact on the overall government budget due to the existence of government-provided health insurance programs such as Medicaid.

JEL Classification: H51, H53, H75, I11, I18, Q18

Keywords: Food Stamps, immigrants, health care

Corresponding author:

Chloe N. East
Department of Economics
University of Colorado, Denver
1380 Lawrence St.
Denver, CO 80217
USA

E-mail: chloe.east@ucdenver.edu

* We would like to thank Adrienne Jones and Katie Genadek for their assistance in accessing the data at the Center for Disease Control Research Data Center in Maryland, and the Boulder Federal Statistics Research Data Center. We are also grateful for comments provided by David Ribar and Carolyn Heinrich, as well as by participants at the APAAM and SEA meetings. The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of the Research Data Center, the National Center for Health Statistics, or the Centers for Disease Control and Prevention. This research was made possible through generous funding from the W.E. Upjohn Institute and the Office of Research Services at UC Denver. All errors are our own.

1. Introduction

The Supplemental Nutrition Assistance Program (SNAP), previously named the Food Stamp Program, is one of the largest safety net programs in the United States. Over 43 million individuals, approximately 13 percent of the U.S. population, received benefits from the program in 2016, at a cost of roughly 70 billion dollars (United States Department of Agriculture 2017).¹ However, the program has an uncertain future. For example, the 2017 executive budget proposed cutting Federal spending on the program by 190 billion dollars over 10 years, through a mix of stricter eligibility requirements and shifting the costs of the program to state level expenditures (Office of Management and Budget 2017). If eligibility for Food Stamps is to be restricted with the stated policy goal of lowering Federal spending, then the impact of program eligibility on participants' health care utilization is vital to cost-benefit analysis. For example, Food Stamp eligibility may have effects on participants that lower their health care utilization. Therefore, tightening eligibility requirements could cause costs to rise in other safety net programs, such as Medicaid, undermining the cost savings from limiting the Food Stamps program. In this study, we ask if such a relationship exists. Specifically, does Food Stamp eligibility have an impact on adult health care utilization.

The quasi-experimental literature exploring the health impacts of Food Stamps receipt has not to-date produced an estimate of Food Stamp eligibility's impact on adult health care use at the time of benefit receipt.² Adults are the largest group of Food Stamp benefit recipients, accounting for 51 percent of all recipients (Hoynes and Schanzenbach 2015). As such, any

¹ We use the name Food Stamps throughout, as this was the name of the program at the time period of our study.

² There are several papers that touch on this topic through the Food Stamp Program's impact on children: East (2017a) found that childhood receipt of Food Stamps improves health outcomes contemporaneously and in the short to medium run. Hoynes, Schanzenbach and Almond (2016), found that childhood receipt of Food Stamps during the initial rollout of the program improved health outcomes in adulthood such as height and the prevalence of metabolic illnesses. Additionally, Meyerhoefer and Pylypchuk (2008) estimate the impact of Food Stamps on medical expenditures, and find increased expenditure levels using a structural model with instrumental variables.

effects of Food Stamps on *adult* health care utilization could have a large impact in terms of dollars spent on health care in the immediate to short-run, because adults have far greater health care expenditures per capita than children do, once children are out of early childhood. To illustrate, in 2013, the United States spent 1.6 thousand dollars per capita on health care for female children aged 5 to 9, as opposed to 7.2 thousand dollars per capita on health care for female adults aged 45 to 49 (Institute for Health Metrics and Evaluation 2017).³

In this study, we estimate the contemporaneous impact of Food Stamp eligibility on adult health care utilization by taking advantage of changing eligibility rules due to the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which created plausibly exogenous variation in Food Stamp eligibility for immigrant populations. PRWORA made most documented non-citizen immigrants ineligible for Food Stamps, an action that was gradually reversed by state and federal laws in the period between 1998 and 2003.⁴ Previous work has shown that these policy changes had a large effect on Food Stamp participation and the benefit amount received (e.g. Borjas 2004, East 2017b). Using an empirical strategy similar to East (2017a; 2017b), we take advantage of differing eligibility criteria across states and over time, and verify using the Current Population Survey there were large effects on Food Stamp receipt among immigrant adults. We then extend the analysis using data from the National Health Interview Survey to estimate the impact of a single year of eligibility on adults' health care utilization and related outcomes.⁵

We find that a year of eligibility decreases the likelihood of multiple physician office visits within the year, but there is little evidence of an effect on the likelihood of any physician

³ For males, the per capita expenditures on health care were 1.9 thousand dollars for children age 5 to 9, and 5.5 thousand dollars for adults age 45 to 49.

⁴ Undocumented immigrants were never eligible for Food Stamps and were therefore unaffected by these changes.

⁵ This comes with the cost of limiting our analysis population to immigrants. This is a large and policy relevant sub-population, but may limit the generalizability of our findings to the general population.

office visits. We find no effect on emergency room utilization or hospitalizations. We also find suggestive evidence that Food Stamps reduce the likelihood of not utilizing specialty medical care due to cost for single women. We examine whether these results could be driven by changes in health outcomes, and we find no consistent evidence that Food Stamps has an impact on self-reported health. We also find no evidence that the population driving our results is those with common chronic conditions such as heart disease, hypertension or diabetes. Our results are therefore suggestive of Food Stamps reducing the need for repeated primary care among the relatively healthy. This might operate through improved nutrition and ability to weather common illnesses, such as the flu, without seeking medical attention. The estimated effects imply that government spending on health care may have been significantly impacted by PRWORA. At the time Food Stamp eligibility was restored to most immigrants, 43% of adult immigrants who received Food Stamp benefits were also covered by the Medicaid program, and a reduction in physician visits could thus decrease Medicaid expenditures for this population.⁶

II. Food Stamp Eligibility and Health Care Utilization

Eligibility for Food Stamps may influence adult health care utilization in several ways. The simplest is via income: though Food Stamps are an in-kind transfer, individuals who receive the benefit could substitute dollars that would have been spent on food to other purposes. Medical care is a normal good, and as such, a positive income shock would be expected to increase utilization of care.⁷ The support for additional consumption of medical care via an

⁶ Author's calculations using the 2004-2007 Annual Social and Economic Supplement to the Current Population Survey. We note that the effects on affordability of specialty care for women suggest that women may have increased the use of specialty care. However, we do not observe utilization of specialty care, so are unable to test this directly. Therefore, for women in particular, the effect on Medicaid expenditures may be ambiguous.

⁷ See Newhouse (1992) for a review of estimates of income elasticities of demand for medical care, or Baltagi et al. 2017 for a more recent estimate.

income effect as a mechanism is somewhat mixed, however; some studies find Food Stamps are treated similar to a pure cash transfer (Moffitt 1989; Currie 2003; Hoynes and Schanzenbach 2009; Bruich 2014; Hoynes, McGranahan and Schanzenbach 2015). On the other hand, Beatty and Tuttle (2014) find that Food Stamps may distort individuals to consume more food than they would have if given an equivalent cash transfer, which would dampen any income effects on health care utilization.

Food Stamps could also have an impact on adult health care utilization through changes in individual health. However, the impact of Food Stamps on health would need to be relatively immediate in order for this to have a contemporaneous impact on health care utilization. For example, changes in nutrition may affect body weight, and many studies find that Food Stamp eligibility increases the likelihood of obesity.⁸ However, much of this evidence estimates the effect of past receipt on current obesity, measuring the impact of prolonged Food Stamp receipt, rather than the contemporaneous effect of the program. Moreover, the study utilizing methods closest to our own finds no immediate impact of immigrants' Food Stamps eligibility on their body mass index (BMI) (Kaushal, 2007).⁹ This is not surprising for the reason previously described: if Food Stamps change BMI through a change in nutrition, such a change would take time before it shows up via health outcomes such as BMI, and perhaps even longer before it subsequently affects health care utilization.

There are still, however, possible pathways for Food Stamps to affect health care utilization via health of the recipient with immediacy. For example, it is possible that mental health is more quickly changed than physical health in response to a change in household

⁸ There are several studies that find Food Stamps increase the likelihood of obesity with varying magnitudes of effect (Townsend et al. 2001; Gibson 2003; Gibson 2004; Chen, Yen and Eastwood 2005; Meyerhofer and Pylypchuck 2008; Baum 2011).

⁹ We also investigate whether the same is true in our sample period described below, which is slightly different than that in Kaushal (2007) and thus uses slightly different policy variation.

resources (Evans and Garthwaite, 2014), and changes in mental health may have immediate health care needs such as suicide prevention counseling. It is also possible that sudden income increases could induce risky behaviors that immediately affect individual health, such as illicit drug use, which can immediately increase health care utilization via overdose. Pollack and Reuter (2006) find that substance use is higher among benefit recipients than in the general population, and several findings suggest mortality may increase shortly after the receipt of income, in part due to increases in drug use (e.g Dobkin and Puller, 2007; Evans and Moore, 2012). To explore these possibilities, we will examine physical and mental health metrics.

The final possibility is that Food Stamps has a direct impact on health care needs because of increased food consumption, and a reduction in the likelihood of a household being food insecure. Food Stamps have been shown to both increase consumption of food, and decrease food insecurity (see for example: Borjas 2004; Wilde and Nord 2005; Ratcliffe, McKernan and Zhang 2011; and reviews by by Hoynes and Schanzenbach 2015 and Gregory, Rabbitt and Ribar 2015). Food insecurity has been identified in the medical and public health literatures as a predictor of increased health care utilization.¹⁰ Most directly related to our hypothesis is a study by Seligman et al. (2014) of hospital admissions in California. They showed that admissions for hypoglycemia increased noticeably for likely low-income individuals at the end of the month, when Food Stamp benefits (which are allocated monthly, often at the beginning of the month) are more likely to have run out. The same pattern did not occur for likely high-income individuals.

III. PRWORA and Food Stamp Eligibility

¹⁰ See for example work by Nelson, Brown and Lurie (1998), Cook et al. (2004), and Weiser et al. (2013). For a more extensive literature review of food insecurity and health see Gundersen and Ziliak (2015).

The enactment of PRWORA in 1996 changed the federal Food Stamp eligibility criteria to exclude most documented non-citizen immigrants. States, however, were given the option to fund benefits for the newly federally-ineligible populations. Nine states took this option prior to 2002, filling the benefit gap back in for the federally-ineligible. These “Fill-In” states were California, Connecticut, Maine, Massachusetts, Minnesota, Nebraska, Rhode Island, Washington and Wisconsin. We will refer to the other 41 states and the District of Columbia as “No-Fill-In” states.¹¹ Later, the 2002 Farm Bill restored federal eligibility to three groups of non-citizen immigrants: the disabled, children, and those who had lived in the United States for at least five years.¹² We show a timelines of the relevant changes to immigrant eligibility in Figure 1.

Loss of eligibility for non-citizen adults in a household did not necessarily cause households to lose all Food Stamp benefits. U.S. born children of non-citizen parents have U.S. citizenship, and thus remain eligible for the program even when their foreign-born parents lose eligibility. Moreover, all foreign-born children were made eligible as part of the Agriculture, Research Extension and Education Reform Act in 1998. As resources within a household can be redistributed amongst its members, loss of individual eligibility is not necessarily equivalent to a loss of access to all Food Stamp benefits. However, when the number of eligible members in the household falls, the benefit amount that can be shared within the household also falls. For example, for a household of three, with one citizen child and two ineligible immigrant parents, benefits could have fallen by almost 66% (\$2400 annually in 1998). This decrease in the benefit amount for households with children was large, so in practice these households may have

¹¹ Even though some of the “No-Fill-In” states did restore benefits to some extent, they often did so with significant additional strings attached. For example, some states required that immigrants apply for citizenship after receiving Food Stamp benefits, and we do not consider these states to be Fill-in states. We define the presence of a fill-in program based on information from the USDA SNAP Policy Database, the California Department of Social Services, and Bitler and Hoynes (2013).

¹² This discussion drawn primarily from Zimmermann and Tumlin (1999), Capps (2004), and Bitler and Hoynes (2013).

behaved as if they had lost eligibility entirely, and stopped participating all together if the small benefit amounts no longer outweighed the costs of participating (Daponte, Sanders and Taylor, 1999). Existing evidence indicates this may have been the case (Van Hook and Balistreri, 2006), so, to simplify the analysis to follow, we focus on the eligibility of adults in the household and do not differentiate between households with and without children.

There were several groups of non-citizen immigrants who were unaffected by the changes in eligibility criteria contained in PRWORA. Immigrants who had worked in the U.S. for 40 quarters and met minimum earnings requirements in each quarter, those who had served in the military, or those who were refugees, asylees, or naturalized citizens remained eligible.¹³

IV. Empirical Strategy

To identify the effect of Food Stamp eligibility on Food Stamp benefit receipt, health care utilization and related outcomes, we estimate the following equation:

$$y_{ist} = \alpha + \beta T.I. Elig_{st} + \gamma_1 X_{ist} + \gamma_2 Z_{st} + \nu_s + \lambda_t + \epsilon_{ist} \quad (1)$$

where y_{ist} is the relevant outcome for individual i living in state s and observed in time t . The variable $T.I. Elig_{st}$ indicates the fraction of the 12 months prior to the month of the survey that treated immigrants are eligible for Food Stamps. Therefore, β indicates the effect of having a full year of eligibility on the outcome of interest. We do not condition on participation in the Food Stamp program, so β captures the intent to treat effect.

We remove the effect of time invariant state characteristics by including a vector of state fixed effects, ν_s , and remove the effect of common national-level shocks over time with, λ_t ,

¹³ Holders of temporary visas and undocumented immigrants were not eligible pre-PRWORA and remained ineligible post-PRWORA. Immigrants who entered the U.S. after the passage of PRWORA in 1996 were subject to restrictions on eligibility for Medicaid/SCHIP, Supplemental Security Income (SSI), and Temporary Assistance for Needy Families (TANF, formerly Aid to Families with Dependent Child, AFDC) for at least their first five years of residence in the U.S. (unless their state of residence provided these benefits with state funds).

which is a vector of survey year and calendar quarter fixed effects to remove any seasonal effects (such as flu-season).¹⁴ We also include X_{ist} , a vector of individual controls for gender, age, race/ethnicity, year of entry to the U.S., number of children under age 5, number of children, number of children born outside the U.S., educational attainment, and marital status. Z_{st} is a vector of state by year controls for the state unemployment rate, state Medicaid/SCHIP program generosity, whether the state had implemented an electronic benefit transfer (EBT) program for Food Stamps, and state Food Stamp outreach spending. We cluster our standard errors by the state of residence and weight using the NHIS and CPS-provided survey weights to account for non-random sampling.

The identifying assumption in this model is that there are no other changes occurring across states and over time that are correlated with the Food Stamp eligibility criteria changes and that affect our outcomes of interest as well. East (2017a) finds no evidence that of state fixed demographic or political characteristics predicting a fill-in program; however, these characteristics are absorbed by the state fixed effects. More importantly, East (2017a) also documents the presence of a fill-in program is not correlated with changes in state's economic conditions or safety net generosity over time.

V. Data

We draw most of our analysis data from the National Health Interview Survey (NHIS) to provide information regarding health care and related outcomes. We use survey years 1998-2007, which span the period of restoration of Food Stamp eligibility for most immigrants.¹⁵ The survey covers roughly 35,000 households annually and is nationally representative.

¹⁴ The CPS data is only available annually so we omit the calendar quarter controls when using those data.

¹⁵ The survey format of the NHIS changes prior to 1998, so we restrict the sample to begin in 1998.

Demographics and some health information are collected for every individual in the household; these data are contained in the “Person File”. The NHIS also chooses an adult at random from each household and asks additional detailed questions about their health and health care; these data are contained in the “Sample Adult File”. We use outcomes from both files; outcomes obtained from the Sample Adult File have smaller sample sizes.

Importantly, the NHIS collects information on the country of birth and year of entry for every foreign-born, which we use to construct our measure of “treated immigrants” and potential controls groups. We define “treated immigrants” as those who were born outside the U.S. and U.S. territories, and who report coming to the U.S. “to stay” less than 15 years, but more than 5 years before the survey. These restrictions on year of entry are intended to capture the group of immigrants likely to be affected by the changes in Food Stamp eligibility, as they have lived in the U.S. long enough to qualify for the Farm Bill restoration, but not long enough to qualify via the 40 quarters of work exemption or by gaining citizenship.¹⁶ There are, however, a number of measurement issues with reported year of entry to the U.S.; therefore, this year of entry restriction should be interpreted as only a rough proxy for those likely to have experienced Food Stamp eligibility changes.¹⁷ Our primary sample is adult heads of household and their spouses, for whom the head of household (male if present, otherwise female) has a high school education or less. This low-educated group is more likely to be affected by Food Stamp policy changes because, prior to welfare reform, they participated in the program at very high rates (East 2017b).

¹⁶ This also excludes immigrants who, due to PRWORA, would do not qualify for other government assistance, such as Medicaid, because they have not lived in the U.S. for five years.

¹⁷ Year of entry information is based off a question about when foreign-born individuals came to the U.S. “to stay” and previous research has documented that for only about 50% of respondents does the year they report they came to the U.S. “to stay” coincide with year that they became legal permanent residents. The latter of which is the relevant year for determining Food Stamp eligibility (U.S. Department of Agriculture Food and Nutrition Service, 2011). Often, this reported year of entry coincides instead with the date of either their first or most recent spell of time spent in the U.S.. For more information on these measurement issues see Redstone and Massey (2004) and Lubotsky (2007). We assume there are not systematic changes in this measurement error that is correlated with Food Stamp eligibility.

We follow the Food Stamp policy definition of “adults” and keep individuals ages 18-59 in our sample. If the head of household is married, we restrict both spouses to be treated immigrants. Later, we also use U.S.-born adults as a control group in alternative analyses.

To measure health care utilization, we include a measure of whether each adult, within the past year, had any physician office visits, any ER visits, or any overnight hospitalizations. The number of physician office visits is coded as a categorical variable in the NHIS, so, to capture intensive margin changes in utilization, we also create a binary variable indicating whether the individual had 2 or more physician office visits in the past year. We also include measures of whether medical care and four types of specialty health care--mental care, dental care, glasses, or prescription medicines--were needed but not received due to cost. To avoid issues of multiple hypothesis testing, we create a summary index that captures the 4 types of specialty care affordability (Anderson, 2008). The index is constructed as a weighted sum of z-scores of the component outcome variables. To create the z-scores of each outcome variable, we calculate the mean and standard deviation for each outcome among treated immigrants living in No-Fill-In states before 2002 (who were not eligible for Food Stamps). The weights are constructed using the inverse of the group of outcomes’ variance-covariance matrix. This method makes efficient use of the information within the measures, as outcomes that are highly correlated are given a lower weight. We then subtract each outcome’s mean and divide by its standard deviation.

To capture health outcomes, we use self-reported measures of overall health, as well as mental health, and obesity/overweight status. The measure of overall health is on a scale of 1 to 5, with 1 denoting “excellent” health and 5 denoting “poor” health. While this is a subjective measure, self-reported health is a good predictor of mortality (Idler and Benyamini, 1997;

DeSalvo et al., 2006). We also create a binary variable to ease interpretation, which takes on a value of one if the individual reports to be in “very good” or “excellent” health. There are six mental health questions, so we create a summary index of the corresponding six variables, similar to the one described above for affordability. These six questions ask how often, in the past 30 days, the individual has felt “sad”, “nervous”, “restless or fidgety”, “hopeless”, “that everything was an effort”, or “worthless”.

State of residence is only available in the restricted-use version of the NHIS, so we access this through permission from the National Center for Health Statistics. We use state of residence to merge in Food Stamp policy rules and state-year level control variables including the state unemployment rate and generosity of other safety net programs. These control variables and data sources are described in more detail in the Appendix. Since most outcome variables are annual measures, we model Food Stamp eligibility as the fraction of the 12 months prior to the survey month that the household would have been eligible for Food Stamps, based on their state of residence of year/month of observation. Table 1 provides summary statistics for the key demographic characteristics that we draw from the NHIS.

We use additional data from the March Current Population Survey (CPS) for 1998-2007. We use the same demographic and geographic variables as the NHIS to construct our sample, and focus on two outcomes of interest: a binary variable for Food Stamp receipt in the past year and the annual dollar value of the Food Stamp benefits received.

VI. Results

VI.A. Program Participation

Before examining the effect of eligibility on health care utilization, we demonstrate that eligibility indeed influenced program participation for treated immigrants. Table 2 reports estimation results for equation (1) using the variables taken from the CPS ASEC Supplement. Panel A shows the results for the full sample of all low-educated adults, and Panel B shows the results only for low-educated single women. A full year of Food Stamp eligibility increases the likelihood of receiving food stamps by 4.4 percentage points, and increases the average annual benefit received by approximately \$86 for treated immigrant adults with high school education or less. The effects roughly double when the sample is further restricted to single women with high school education or less, although the average rates of participation among this group are also roughly double the full low-educated sample. These results correspond with findings from East (2017b) who showed that eligibility caused low-educated immigrants to participate in Food Stamps at higher rates.

VI.B. Utilization

We next examine how access to Food Stamps affects health care utilization in Table 3. Again, Panel A shows the results for the full sample of all low-educated adults, and Panel B shows the results only for low-educated single women. A full year of Food Stamp eligibility does not have an impact on the likelihood of having any office visits in the previous year that is significant at conventional levels (column 1). However, the point estimate is negative for both all adults and single women, with the latter result having a point estimate that is quite large relative to the mean (a 23 percent reduction), providing some weakly suggestive evidence that for single women, Food Stamp eligibility may reduce the need for any physician care. Column 2 demonstrates that a full year of Food Stamp eligibility does cause a statistically significant

decline in the likelihood of going to more than one office visit in the past year of 14 percentage points for all adults, and 20 percentage points for single women (both estimates have $p < 0.01$). This provides strong evidence that Food Stamps reduce the amount of care consumed, conditional on using some care (this is reinforced by a strong estimated impact of eligibility on the likelihood of multiple office visits conditional on any visits – a direct estimate of the response on the intensive margin - shown in column 4). The results on the intensive margin have the same direction as responses on the intensive margin for outpatient care when individuals are given Medicaid, as found by Finkelstein et al. (2013).¹⁸

Column 3 shows that for all adults, these intensive effects are concentrated among the second or third annual visit, whereas for single women the intensive effects reach into larger number of annual visits. We find no evidence of changes in the likelihood of having any overnight hospitalizations or ER visits, although these point estimates are also mostly negative (columns 5-7).¹⁹ If the reduction in the number of doctor visits is due to better case management, we might expect to see changes in hospital or ER utilization, similar to Seligman et al. (2014), however, ER and hospital visits are quite rare in the data relative to doctor visits, which may explain the imprecision of our results on these outcomes.²⁰

The estimates on two or more physician visits imply intent-to-treat effects of 44% and 45%, respectively, which are quite large. However, the confidence intervals are also very wide, which is not dissimilar to the large confidence intervals in other studies utilizing similar methods such as Borjas (2004) and Kaushal (2007). Moreover, we are cautious about interpreting the

¹⁸ Finkelstein et al. (2013) also found effects on utilization for Medicaid on the extensive margin. It is difficult to compare magnitudes as the utilization variables in Finkelstein et al. (2013) are continuous and ours are categorical.

¹⁹ It is important to note that “office visit” includes times seeing a doctor or health care professional at a doctor’s office, clinic, or other place and does *not* include ER visits, overnight hospitalizations, dental visits or telephone calls. So these outcomes are mutually exclusive.

²⁰ We have also examined whether the number of ER visits, conditional on any visits, is affected and find no evidence that it is.

sample mean as the counterfactual incidence rate of two or more physician visits, because those that actually participate in Food Stamps are likely to be much more disadvantaged than the full sample. For example, 3.6% of treated immigrants who are poor report being diagnosed with diabetes, relative to 2.3% for the non-poor. Similarly, the rates of heart disease, hypertension, and overweight/obesity, as well as the incidence of heart attacks, are all much higher among the poor relative to non-poor sample.²¹

VI.C. Affordability

To understand the reason for the change in the intensity of doctor visits, we examine several possible mechanisms. First, we test whether Food Stamps affected the affordability of general medical care or four types of specialty care (prescription medication, mental health care, dental care, eyeglasses). If Food Stamps increase family resources, allowing individuals to afford better care or specialty care—e.g. medication to better manage chronic conditions—this may reduce the need for doctor office visits. As shown in Table 4, there is no evidence that Food Stamps affect the likelihood of not receiving needed medical care due to cost (column 1). However, the summary index of affordability of specialty care indicates that, for single women, eligibility for Food Stamps reduces the likelihood they did not receive specialty care due to issues of cost (column 2). This is similar to the suggestive evidence for *children* found in Bronchetti, Christensen, and Hoynes (2017), who document that higher-value SNAP benefits reduce unaffordability of children’s health care. Looking across the columns, the effect on the summary index of affordability of specialty care appears to be driven primarily by a decline in the unaffordability of mental and dental care, although the estimates on all types of specialty care

²¹ Authors’ calculations using the NHIS.

are negative.²² This suggests one potential pathway for reduced doctor visits is through improved affordability of needed specialty care. It is important to note, however, that the affordability of mental care may be driven by changes in health, as well as changes in affordability, because the question refers to care that is “needed [but not received] because you couldn’t afford it.” Therefore, we next examine how Food Stamps directly affect mental and physical health outcomes that may be influenced by short-run changes in access to Food Stamps.

VI.D. Self-Reported Health

Table 5 includes results for four summary variables of overall physical and mental health. Changes in these outcomes could explain the changes in the number of doctor visits or the unaffordability of mental care. The first column examines the categorical measure of self-reported overall health, and the second column transforms this variable into a dummy variable to ease interpretation—this variable is equal to one if the individual reports being in “Excellent” or “Very Good” health. Across both outcomes, we find no effect of Food Stamp eligibility on self-assessed health. There is also no statistically significant effect on the likelihood of being overweight or obese in the short-run, confirming the findings of Kaushal (2007). Finally, we find no evidence of effects on mental health, indicating the change in affordability of mental health care found in the previous section (reported in Table 4) for single women is not due to a change in whether mental care is perceived to be needed.

VI.E. Chronic Illness

²² Our measure of doctor visits does not include dental care. Therefore, we are unable to test if these individuals actually received more dental care because of Food Stamps.

We next explore the possibility that Food Stamps decreased health care utilization by allowing existing patients to improve their management of chronic illnesses. This could be due to increased resources in general, or improved nutrition allowing for better regulation of glycemic illnesses such as diabetes. To accomplish this, we once again estimate equation (1) using a binary variable for multiple office visits in the past year as an outcome, as this was where we estimated the strongest response to Food Stamp eligibility among utilization outcomes. We then include in equation (1) an additional interaction between the eligibility measure and a binary variable for if the individual reports having ever been diagnosed with a chronic illness. Specifically, we look at diabetes, hypertension, any reported chronic illness (heart disease, obesity, diabetes, or hypertension), and self-reported “poor” or “fair” health, which can be viewed as a catch-all that is likely correlated with chronic illness. If the coefficient on these interactions shows a strong response, this would be evidence of Food Stamp eligibility having an additional effect on utilization for individuals with those specific chronic illnesses.

The results from this analysis are reported in Table 6. None of the interaction coefficients are statistically significant at conventional levels. These estimates suggest that reductions in the utilization of health care due to Food Stamp eligibility were not due to better management of chronic conditions.

To summarize, we find evidence that Food Stamp eligibility reduces the likelihood of two or more doctor visits in the past year, as well as needing specialty care but not receiving it due to cost for single women. We find no evidence that these changes in health care utilization and health care affordability are driven by changes in physical or mental health, or due to individuals with chronic conditions in particular needing less care. The increase in resources from Food Stamp access allow single women to afford needed specialty medical care they previously were

unable to. While we are unable to determine the exact mechanisms behind the effect on doctor visits, our results do suggest a potential mechanism may be improved management of general health (as opposed to chronic conditions), due to increased resources, or improved nutrition.

VII. Robustness and Specification Checks

The identifying assumption in the regression model is that there are no other changes occurring across states and over time that are correlated with the Food Stamp policy changes that also affect adult health care. One way to test the validity of this assumption is to implement a triple difference model with low-educated U.S.-born adults as a control group. To do this we estimate a model similar to equation (1) above, but here we also include control/treatment status fixed effects (that indicate whether the individual is a “treated immigrant” or U.S.-born), as well as state by control/treatment status fixed effects, and year by control/treatment status fixed effects. We also interact the state by year controls, Z_{st} , with whether the individual is in the control/treatment group to allow for differential effects of economic conditions and state policy on immigrants and natives. Finally, we include the same measure of treated immigrants eligibility $T.I. Elig_{st}$ as in equation (1), as well as this measure interacted with whether the individual is in the treatment group: $T.I. Elig_{st} * Treated Immigrant_i$.

If the identifying assumption is correct, we expect the coefficient on treated immigrants’ eligibility to be close to zero, as this captures the effect of treated immigrants’ eligibility on natives’ outcomes. Additionally, the coefficient on the interaction term should be similar to our baseline estimates. In this, and all other robustness and specification checks, we focus on the outcome of two or more doctor visits, as this was the most precisely estimated and consistent result. This result is shown in column 2 of Table 7 and confirms both of these predictions. The

triple difference model also provides a falsification test in the first row of column 2—there is no effect of immigrant-specific Food Stamp eligibility on natives’ outcomes. Additionally, we can push this triple difference model even further by including state by year fixed effects, which flexibly absorbs any common shocks to health care that affect both natives and treated immigrants. In this model, we drop the un-interacted measure of treated immigrants’ eligibility. These results are shown in the third column of Table 7 and provide very similar estimates as the baseline model.²³

The main limitation of the triple difference model is that natives may not be an ideal control group for treated immigrants. So, an alternative test of the identifying assumption is to directly include controls for other state-by-year policies and characteristics. We do this in columns 2-4 of Table 8. Accounting for other state safety net generosity (maximum TANF benefits, presence of a SCHIP program or a state EITC), and state attitudes towards immigrants do not substantively change the results. The inclusion of the state SNAP options (online application, Broad-based Categorical Eligibility, time requirements for re-eligibility certification, face-to-face interview and recertification requirements, fingerprint requirements, and vehicle exemptions) cause the coefficient for single women to no longer be statistically significantly different from zero. This is due to an increase in standard error as well as a slight decrease in the magnitude of the estimate. The results remain similar for all adults. A final concern with the identifying assumption is that Fill-In states may have had different trends in health care than No-Fill-In states, which may bias the results. To account for this, we include state linear time trends in column 5 and the results are very similar to the baseline.

²³ These specification checks yield similar results when replicated for the other outcome variables in the results section. These are available upon request.

We also conduct a number of specification checks on the main results, shown in columns 6-8 of Table 8. First, we drop all observations from California, as California is by far the largest Fill-In state, and the results remain similar. Next, we include census region-by-year fixed effects to account for differences across regions and time in health care utilization. These fixed effects will account for, for example, a large flu epidemic in the south in one year. This addition causes the standard errors to increase and the coefficients to shrink slightly, so the point estimates are no longer statistically different from zero, however, qualitatively the results are very similar to the main estimates. Finally, we include calendar month-by-year fixed effects. The policy changes occur at the year and month level, so there is still identifying variation left after inclusion of these controls; however, this is a very demanding specification. Nevertheless, the results remain similar.²⁴

We next examine the effects on several different subgroups likely to be less affected by the policy changes than our primary group of interest. If the main results were driven by some unaccounted-for changes in health care occurring across states and over time, then the effect estimated with these “placebo” groups would be similar to our main results. First, we restrict the sample to immigrants who entered the U.S. more than 10 years, and more than 20 years before the survey. The longer immigrants have been in the U.S., the less likely will be affected by the Food Stamp eligibility changes, as they are more likely to either have become naturalized citizens, or to have earned 40 quarters of qualifying work in the U.S.. As expected, the effects are much smaller for these groups, shown in columns 2-3 of Table 9. For all adults, the effect falls to zero, and for single women the effect is still statistically significant, but attenuated relative to the main results. However, these results should be interpreted with the caveat that there is

²⁴ The results for single women’s affordability of specialty medical care and results for food stamp receipt and benefit amount are also qualitatively similar across all these robustness and specification checks. Results available upon request.

measurement error in foreign-born individuals' year of arrival to the U.S.. We also break down the samples into four disaggregate education groups: less than high school, high school, some college, and college or more. We expect there to be much smaller effects on the highly educated groups, as they participated in the Food Stamp program at much lower rates prior to welfare reform, and indeed this is what we find in columns 4-7.

As a final test of our identification strategy, we examine how Food Stamp eligibility is correlated with the observable characteristics of our sample that are not used in the construction of our eligibility measure. A consistent pattern of an observable characteristic predicted by eligibility could be seen as suggestive evidence that our results are driven by selective changes in the sample composition. Results from this analysis are shown in Table 10. There are no consistent patterns.

IX. Conclusion

This study provides quasi-experimental evidence about the effects of the Food Stamp program on adults' contemporaneous health care utilization. We find a reduction in the number of office visits per year, but less evidence of changes along the extensive margin of health care utilization. This change in utilization does not appear to be driven by changes in self-reported physical or mental health, or by those with common chronic illnesses. For single women, access to Food Stamps increases the affordability of specialty medical care, which may explain some of the effects we find on doctor visits for this subgroup. These results suggest improved management of health care needs due to increased resources, or improved nutrition, may be part of the reason for the decrease in the number of doctor visits per year.

The reduction in physician visits represents an important channel through which providing Food Stamps may reduce health care expenditures. Importantly, roughly 44% of Food Stamp recipients in our population also received health insurance coverage through the Medicaid program²⁵, so this reduction in health care expenditure accrues to the government, as well as to the individuals receiving the benefits who pay out of pocket and to private insurers.²⁶ To gauge the magnitude of these savings, we take an estimate of the Colorado Medicaid payment for a 15-minute office visit: \$64 in 2017 (Colorado Department of Health Care Policy and Financing 2017). This is the most commonly billed type of visit, and many visits include additional billable procedures (such as laboratory tests) not included in the office visit component of the bill, so we view this as a lower bound for expenditures. If we further assume most individuals who reduce the intensive margin of doctor visits are moving from two doctor visits per year to one doctor visit per year, the point estimate in Table 1 indicates that providing Food Stamps reduces health care expenditures by \$9 per person ($.144 * 64$). This is a lower bound of 4% of total expenditures on Food Stamps per capita²⁷, indicating that a significant portion of government expenditures on Food Stamps may be recovered just through reductions in doctor visits for adults.

²⁵ Authors' calculation using the Current Population Survey. Statistics calculated using the years 2004-2007 when eligibility was restored to the population of interest.

²⁶ However, we also note that we do see suggestive evidence of increases in specialty health care utilization for single women which may also be financed by Medicaid.

²⁷ Expenditures on Food Stamps in 2014 were 74.1 billion (Hoynes and Schanzenbach, 2015) and the total U.S. population in this year was 318.6 million. Converted in 2017 dollars, this is a cost of \$243 per person.

References

- Anderson, Michael L. 2008. "Multiple inference and gender differences in the effects of early intervention: A reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American statistical Association*, 103(484): 1481–1495.
- Baltagi, Badi H., Rafgale Lagravinese, Francesco Moscone, and Elisa Tosetti. 2017. "Health Care Expenditure and Income: A Global Perspective" *Health Economics*, 26(7): 863-874.
- Baum, Charles L. 2011. "The Effects of Food Stamps on Obesity" *Southern Economic Journal*, 77(3): 623-651.
- Bitler, Marianne P, and Hilary W Hoynes. 2013. "Immigrants, Welfare Reform, and the US Safety Net." *Immigration, Poverty, and Socioeconomic Inequality*, 315.
- Borjas, George. 2004. "Food Insecurity and Public Assistance." *Journal of Public Economics*, 88: 1421-1443.
- Erin Bronchetti, Garret Christensen and Hilary W. Hoynes. 2017. "The Real Value of SNAP Benefits and Health Outcomes." *University of Kentucky Center for Poverty Research Discussion Paper Series*.
- Bruich, Gregory A. 2014. "The Effect of SNAP Benefits on Expenditures: New Evidence from Scanner Data and November 2013 Benefit Cuts." *Mimeo*.
- Capps, Randolph. 2004. "Assessing Implementation of the 2002 Farm Bill's Legal Immigrant Food Stamp Restorations: Final Report to the United States Department of Agriculture Food and Nutrition Service." *The Urban Institute*.
- Castellari, Elena, Chad Cotti, John Gordanier, and Orgul Ozturk. 2016. "Does the Timing of Food Stamp Distribution Matter? A Panel-Data Analysis of Monthly Purchasing Patterns of US Households." *Health Economics (forthcoming)*.
- Colorado Department of Health Care Policy and Financing. "Health First Colorado Fee Schedules" Available: <https://www.colorado.gov/pacific/hcpf/provider-rates-fee-schedule>
- Cook, John T., Deborah A. Frank, Carol Berkowitz, Maureen M. Black, Patrick H. Casey, Diana B. Cutts, Alan F. Meyers, Nieves Zaldivar, Anne Skalicky, Suzette Levenson, Tim Heeren and Mark Nord. 2004. "Food Insecurity is Associated with Adverse Health Outcomes among Human Infants and Toddlers" *The Journal of Nutrition*, 134(6): 1432-1438.
- Chen, Z., S. Yen and D. Eastwood. 2005. "Effects of Food Stamp Participation on Body Weight and Obesity." *American Journal of Agricultural Economics (proceedings)*, 87: 1167-1173.
- Cotti, Chad, John Gordanier, and Orgul Ozturk. 2016. "Eat (and Drink) Better Tonight: Food Stamp Benefit Timing and Drunk Driving Fatalities." *American Journal of Health Economics*, 2(4): 511-534.
- Currie, Janet. 2003. "US Food and Nutrition Programs." In *Means-Tested Transfer Programs in the United States*. 199-290. University of Chicago Press.
- DeSalvo, Karen B., et al. "Mortality prediction with a single general self-rated health question." *Journal of general internal medicine* 21.3 (2006): 267-275.
- Dobkin, Carlos, and Steven L. Puller. "The effects of government transfers on monthly cycles in drug abuse, hospitalization and mortality." *Journal of Public Economics* 91.11 (2007): 2137-2157.
- East, Chloe. 2017a. "The Effect of Food Stamps on Children's Health: Evidence from Immigrants' Changing Eligibility." *Mimeo*.

- East, Chloe. 2017b. "The Labor Supply Response to Food Stamp Access" *Mimeo*.
- Ellis, Randall P., Bruno Martins, and Wenjia Zhu. 2017. "Health Care Demand Elasticities by Type of Service" *Journal of Health Economics*, 55: 232-243.
- Evans, William N., and Timothy J. Moore. "Liquidity, economic activity, and mortality." *Review of Economics and Statistics* 94.2 (2012): 400-418.
- Evans, William N, and Craig L Garthwaite. 2014. "Giving Mom a Break: The Impact of Higher EITC Payments on Maternal Health." *American Economic Journal: Economic Policy*, 6(2): 258–90.
- Finkelstein, A., Taubman, S., Wright, B., Bernstein, M., Gruber, J., Newhouse, J.P., Allen, H., Baicker, K. and Oregon Health Study Group, 2012. "The Oregon health insurance experiment: evidence from the first year." *The Quarterly journal of economics*, 127(3), pp.1057-1106.
- Gibson, Diane. 2003. "Food Stamp Program Participation is Positively Related to Obesity in Low Income Women." *Journal of Nutrition*, 133: 2225-2231.
- Gibson, Diane. 2006. "Long-Term Food Stamp Program Participation is Positively Related to Simultaneous Overweight in Young Daughters and Obesity in Mothers." *Journal of Nutrition*, 136: 1081-1085.
- Gregory, Christian, Matthew P. Rabbitt, and David C. Ribar. "The supplemental nutrition assistance program and food insecurity." *SNAP matters: How food stamps affect health and well-being* (2015): 74-106.
- Gundersen, Craig and James P. Ziliak. 2015. "Food Insecurity and Health Outcomes" *Health Affairs*, 34(11): 1830-1839.
- Hastings, Justine and Ebonya Washington. 2010. "The First of the Month Effect: Consumer Behavior and Store Responses." *American Economic Journal: Economic Policy*, 2(2): 142-162.
- Hoynes, Hillary W., Leslie McGranahan, and Diane Whitmore Schzenbach. 2015. "SNAP and Food Consumption." In *SNAP Matters: How Food Stamps Affect Health and Well-Being*, ed. Timothy Smeeding, Judith Bartfeld, Craig Gundersen and James P. Ziliak. Stanford University Press.
- Hoynes, Hillary W., and Diane Whitmore Schzenbach. 2009. "Consumption Responses to In-Kind Transfers: Evidence from the Introduction of the Food Stamp Program." *American Economic Journal: Applied Economics*, 109-139.
- Hoynes, Hilary W., and Diane Whitmore Schzenbach. 2015. *US food and nutrition programs*. No.w21057. National Bureau of Economic Research.
- Hoynes, Hillary W., Diane Whitmore Schzenbach, and Douglas Almond. 2016. "Long-Run Impacts of Childhood Access to the Safety Net." *The American Economic Review*, 106(4): 903-934.
- Idler, Ellen L., and Yael Benyamini. "Self-rated health and mortality: a review of twenty-seven community studies." *Journal of health and social behavior* (1997): 21-37.
- Institute for Health Metrics and Evaluation (IHME). 2017. "GBD Compare Data Visualization." Seattle, WA: IHME, University of Washington. Available <http://vizhub.healthdata.org/gbd-compare>
- Kaushal, Neeraj. 2007. "Do Food Stamps Cause Obesity? Evidence from Immigrant Experience" *Journal of Health Economics*, 26(5): 968-991.

- Klerman, Jacob Alex, and Caroline Danielson. 2011. "The Transformation of the Supplemental Nutrition Assistance Program." *Journal of Policy Analysis and Management*, 30(4): 863-888.
- Lubotsky, Darren. 2007. "Chutes or ladders? A longitudinal analysis of immigrant earnings." *Journal of Political Economy*, 115(5): 820-867.
- Meyer, Bruce D, Wallace KC Mok, and James X Sullivan. 2009. "The under-reporting of transfers in household surveys: its nature and consequences." National Bureau of Economic Research.
- Meyerhoefer, Chad D., and Yuriy Pylypchuk. 2008. "Does Participation in the Food Stamp Program Increase the Prevalence of Obesity and Health Care Spending?" *American Journal of Agricultural Economics*, 90: 287-305.
- Moffitt, Robert. 1989. "Estimating the Value of an In-Kind Transfer: The Case of Food Stamps" *Econometrica*, 57(2): 385-409.
- Nelson, Karin, Margaret E. Brown and Nicole Lurie. 1998. "Hunger in an Adult Patient Population" *JAMA*, 279(15): 1211-1214.
- Newhouse, Joseph P. 1992. "Medical Care Costs: How Much Welfare Loss?" *The Journal of Economic Perspectives*, 6(3): 3-21.
- Office of Management and Budget. 2017. "Budget of the U.S. Government, A New Foundation for American Greatness, Fiscal Year 2018." Available: <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/budget.pdf>
- Pollack, Harold, and Peter Reuter. 2006. "Welfare Receipt and Substance-Abuse Treatment among Low-Income Mothers: The Impact of Welfare Reform." *American Journal of Public Health*, 96(11): 2024-2031.
- Ratcliffe, Caroline, Signe-Mary McKernan, and Sisi Zhang. 2011. "How Much Does the Supplemental Nutrition Assistance Program Reduce Food Insecurity?" *American Journal of Agricultural Economics*, 93(4): 1082-1098.
- Redstone, Ilana, and Douglas S Massey. 2004. "Coming to stay: An analysis of the US census question on immigrants year of arrival." *Demography*, 41(4): 721-738.
- Seligman, Hilary K. Ann F. Bolger, David Guzman, Andrea López, and Kirsten Bibbins-Domingo. 2014. "Exhaustion of Food Budgets at Month's End and Hospital Admissions for Hypoglycemia." *Health Affairs*, 33(1): 116-123.
- Townsend, M., J. Peerson, B. Love, C. Achterberg, and S.P.Murphy. 2001. "Food Insecurity is Positively Related to Overweight Among Women." *Journal of Nutrition*, 131: 1738-1745.
- United States Department of Agriculture Food and Nutrition Service. 2011. "Supplemental Nutrition Assistance Program Guidance on Non-Citizen Eligibility."
- United States Department of Agriculture. 2017. "Supplemental Nutrition Assistance Program (SNAP) National Level Annual Summary" Available: <https://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap>
- Weiser, Sheri D., Abigail Hatcher, Edward A. Frongillo, David Guzman, Elise D. Riley, David R. Bangsberg, and Margot B. Kushel. 2013. "Food Insecurity is Associated with Greater Acute Care Utilization Among HIV-Infected Homeless and Marginally Housed Individuals in San Francisco." *Journal of General Internal Medicine*, 28(1): 91-98.
- Wilde, Parke and Mark Nord. 2005. "The Effect of Food Stamps on Food Security: A Panel Data Approach" *Applied Economic Perspectives and Policy*, 27(3) 425-432.

- Yen, Steven T., Margaret Andrews, Zhuo Chen, and David B. Eastwood. 2008. "Food Stamp Program Participation and Food Insecurity: An Instrumental Variables Approach." *American Journal of Agricultural Economics*, 90(1): 117-132.
- Zimmermann, Wendy, and Karen C Tumlin. 1999. "Patchwork policies: State assistance for immigrants under welfare reform." *The Urban Institute*.

Figure 1: PRWORA Eligibility Timeline

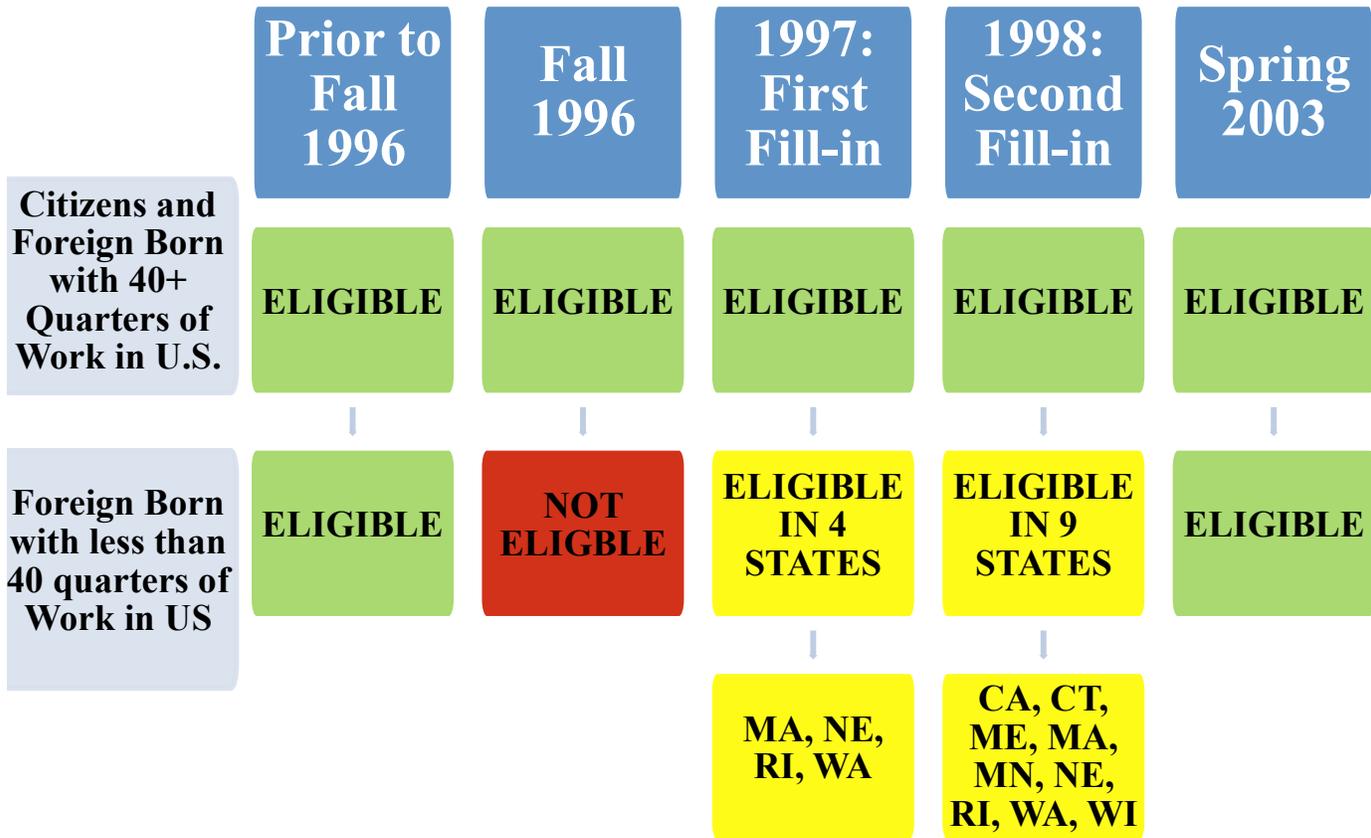


Table 1. Demographic Summary Statistics - NHIS

	All Adults with High School Education or Less	Single Women with High School Education or Less
Female	0.45	--
Year Entered U.S.	1996	1995
White	0.59	0.52
Black	0.07	0.15
Asian	0.04	0.04
Hispanic	0.75	0.71
Number of Children	1.26	1.12
Married	0.64	--
Less than High School	0.65	0.66
Age	33.6	33.2

Notes: Data come from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. Means weighted using the sample weights.

Table 2. Effect of Food Stamp Eligibility on Food Stamp Receipt

	(1)	(2)
	Received Food Stamps Last Year	Benefit Amount Received
<u>A: All Adults with High School Education or Less</u>		
Fraction of Past Year T.I. Eligible for Food Stamps	0.044 ^{***} (0.013)	85.750 ^{***} (39.828)
Mean Outcome Variable	0.12	289.06
N	11,674	11,674
<u>B: Single Women with High School Education or Less</u>		
Fraction of Past Year T.I. Eligible for Food Stamps	0.096 ^{***} (0.032)	201.132 ^{***} (78.151)
Mean Outcome Variable	0.24	611.17
N	2,785	2,785

Notes: Data from the 1998-2007 CPS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Standard errors are clustered at the state level and all results weighted using the sample weights. * p<.10, ** p<0.05, *** p<.01

Table 3. Effect of Food Stamp Eligibility on Health Care Utilization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Any Office Visits	2+ Office Visits	4+ Office Visits	2+ Office Visits (Conditional on Any)	Any Overnight Hospitalization	Any ED Visits	2+ ED Visits
<u>A: All Adults with High School Education or Less</u>							
Fraction of Past Year T.I. Eligible for Food Stamps	-0.022 (0.058)	-0.144*** (0.051)	-0.048 (0.057)	-0.244*** (0.073)	-0.015 (0.017)	-0.065 (0.039)	0.003 (0.021)
Mean Outcome Variable	0.492	0.320	0.162	0.651	0.074	0.165	0.004
N	3,026	3,026	3,026	1,498	6,644	3,041	3,041
<u>B: Single Women with High School Education or Less</u>							
Fraction of Past Year T.I. Eligible for Food Stamps	-0.142 (0.108)	-0.199*** (0.072)	-0.125* (0.066)	-0.192** (0.091)	-0.017 (0.045)	-0.031 (0.072)	-0.009 (0.032)
Mean Outcome Variable	0.611	0.442	0.144	xx	0.112	0.188	xx
N	764	764	764	478	1,218	770	770

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Standard errors are clustered at the state level and all results weighted using the sample weights. * p<.10, ** p<0.05, *** p<.01

Table 4. Effect of Food Stamp Eligibility on Health Care Affordability

	In the Past 12 Months...					
	(1) Needed Medical Care but not Received due to Cost	(2) Summary Index of Affordability of Specialty Care	(3) Needed Prescription Medication but could not Afford	(4) Needed Mental Care but could not Afford	(5) Needed Dental Care but could not Afford	(6) Needed Eyeglasses but could not Afford
<u>A: All Adults with High School Education or Less</u>						
Fraction of Past Year T.I. Eligible for Food Stamps	0.009 (0.026)	-0.093 (0.160)	0.001 (0.028)	-0.024 (0.021)	-0.011 (0.028)	0.002 (0.022)
Mean Outcome Variable	0.097	0.038	0.067	0.017	0.099	0.037
N	6,643	2,732	3,050	3,051	3,050	2,732
<u>B: Single Women with High School Education or Less</u>						
Fraction of Past Year T.I. Eligible for Food Stamps	0.026 (0.054)	-0.847* (0.442)	-0.084 (0.096)	-0.098** (0.046)	-0.149* (0.084)	-0.147 (0.091)
Mean Outcome Variable	0.133	0.296	0.121	0.030	0.196	0.070
N	1,218	681	771	771	771	681

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Standard errors are clustered at the state level and all results weighted using the sample weights.

* p<.10, ** p<0.05, *** p<.01

Table 5. Effect of Food Stamp Eligibility on Physical and Mental Health

	(1)	(2)	(3)	(4)
	Overall Health (1="Excellent" ... 5="Poor")	In "Excellent" or "Very Good" Health (binary)	Overweight or Obese (binary)	Z-Score Summary Index of Mental Health
<u>A: All Adults with High School Education or Less</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	0.064 (0.066)	-0.026 (0.033)	-0.081 (0.051)	0.020 (0.060)
Mean Outcome Variable	2.173	0.614	0.583	0.016
N	6,649	6,649	2,883	3,017
<u>B: Single Women with High School Education or Less</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	0.207 (0.0129)	-0.055 (0.059)	-0.018 (0.117)	0.220 (0.207)
Mean Outcome Variable	2.311	0.556	0.503	-0.307
N	1,218	1,218	727	761

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Standard errors are clustered at the state level and all results weighted using the sample weights.

* p<.10, ** p<0.05, *** p<.01

Table 6. Effect of Food Stamp Eligibility on Health Care Utilization for Individuals with Chronic Illness

	Interact Eligibility with Chronic Condition				
	(1) Baseline	(2) Diabetes	(3) Hypertension	(4) Heart Disease, Obesity, Diabetes or Hypertension	(5) Self- Reported “Poor” or “Fair” Health
<u>Outcome: 2+ Office Visits in Past Year</u>					
<u>A: All Adults with High School Education or Less</u>					
Fraction of Past Year T.I. Eligible for Food Stamps	-0.144 ^{***} (0.051)	-0.154 ^{***} (0.049)	-0.131 ^{**} (0.052)	-0.130 ^{**} (0.053)	-0.153 ^{***} (0.054)
Fraction of Past Year T.I. Eligible for Food Stamps x Chronic Condition		0.170 (0.116)	-0.059 (0.076)	-0.004 (0.074)	0.035 (0.115)
Mean of Chronic Measure		0.03	0.079	0.1	0.076
N		3,013	3,021	3,026	3,026
<u>Outcome: 2+ Office Visits in Past Year</u>					
<u>B: Single Women with High School Education or Less</u>					
Fraction of Past Year T.I. Eligible for Food Stamps	-0.199 ^{***} (0.072)	-0.186 ^{**} (0.075)	-0.213 ^{**} (0.080)	-0.201 ^{**} (0.084)	-0.206 ^{***} (0.073)
Fraction of Past Year T.I. Eligible for Food Stamps x Chronic Condition		-0.156 (0.159)	0.126 (0.196)	0.035 (0.177)	0.046 (0.095)
Mean of Chronic Measure		0.04	0.101	0.123	0.104
N		761	762	764	764

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Standard errors are clustered at the state level and all results weighted using the sample weights. * p<.10, ** p<0.05, *** p<.01

Table 7. Triple Difference Specification Check of the Effect of Eligibility on Health Care Utilization

	(1)	Triple Difference	
		(2)	(3)
	Baseline	Without State by Year Fixed Effects	With State by Year Fixed Effects
<u>Outcome: 2+ Office Visits in Past Year</u>			
	<u>A: All Adults with High School Education or Less</u>		
Fraction of Past Year T.I. Eligible for Food Stamps		-0.005 (0.010)	
Fraction of Past Year T.I. Eligible for Food Stamps x Treated Immigrant	-0.144 ^{***} (0.051)	-0.135 ^{**} (0.052)	-0.137 ^{**} (0.054)
N	3,026	65,900	65,900
<u>Outcome: 2+ Office Visits in Past Year</u>			
	<u>B: Single Women with High School Education or Less</u>		
Fraction of Past Year T.I. Eligible for Food Stamps		0.022 (0.023)	
Fraction of Past Year T.I. Eligible for Food Stamps x Treated Immigrant	-0.199 ^{***} (0.072)	-0.232 ^{***} (0.073)	-0.237 ^{***} (0.075)
N	764	19,951	19,951

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. In the triple difference specifications, the sample also includes all U.S.-born individuals aged 18-59 whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Triple difference specifications in columns 2 and 3 also include state by immigrant status, and year by immigrant status fixed effects, as well as the state by year controls interacted with immigrant status. Standard errors are clustered at the state level and all results weighted using the sample weights. * p<.10, ** p<0.05, *** p<.0

Table 8. Robustness and Specification Checks of Effects of Eligibility on Two or More Doctor Visits

	<u>State by Year Controls</u>				<u>Specification Checks</u>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Baseline	Other Safety Net Program Generosity	Attitudes towards Immigrants	Other State SNAP Options	State Linear Time Trends	Drop California	Include Census Region by Year Fixed Effects	Include Year by Calendar Month Fixed Effects
<u>Outcome: 2+ Office Visits in Past Year</u>								
			<u>A: All Adults with High School Education or Less</u>					
Fraction of Past Year T.I. Eligible for Food Stamps	-0.144 ^{***} (0.051)	-0.155 ^{***} (0.057)	-0.159 ^{***} (0.057)	-0.142 ^{**} (0.061)	-0.219 ^{**} (0.082)	-0.160 [*] (0.086)	-0.107 (0.069)	-0.130 ^{***} (0.044)
N	3,026	3,026	3,026	3,026	3,026	2,259	3,026	3,026
<u>Outcome: 2+ Office Visits in Past Year</u>								
			<u>B: Single Women with High School Education or Less</u>					
Fraction of Past Year T.I. Eligible for Food Stamps	-0.199 ^{***} (0.072)	-0.207 ^{**} (0.083)	-0.265 ^{***} (0.085)	-0.137 (0.137)	-0.331 ^{***} (0.113)	-0.192 (0.117)	-0.128 (0.100)	-0.202 ^{**} (0.089)
N	764	764	764	764	764	575	764	764

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. They also include the following demographic controls: gender, age, year of immigration, race/ethnicity, marital status, and educational attainment, as well as number of kids under 5, number of kids, number of kids born outside the US, and the number of elderly living in the household. Standard errors are clustered at the state level and all results weighted using the sample weights. * p<.10, ** p<0.05, *** p<.01

Table 9. Subgroup Analysis of the Effects of Eligibility on Two or More Office Visits

	<u>Year of Entry</u>			<u>Education</u>			
	(1) Baseline (High School or Less)	(2) Entered U.S. >10 Years Before Survey	(3) Entered U.S. >20 Years Before Survey	(4) Head Less than High School	(5) Head High School Only	(6) Head Some College	(7) Head College of More
<u>Outcome: 2+ Office Visits in Past Year</u>							
				<u>A: All Adults</u>			
Fraction of Past Year T.I. Eligible for Food Stamps	-0.144*** (0.051)	-0.001 (0.025)	-0.031 (0.027)	-0.144* (0.075)	-0.103 (0.096)	0.176* (0.095)	0.041 (0.066)
N	3,026	20,202	10,324	2,115	932	762	1,144
<u>Outcome: 2+ Office Visits in Past Year</u>							
				<u>B: Single Women</u>			
Fraction of Past Year T.I. Eligible for Food Stamps	-0.199*** (0.072)	-0.107** (0.037)	-0.118*** (0.046)	-0.192** (0.094)	-0.207 (0.202)	-0.195 (0.187)	-0.072 (0.236)
N	764	4,805	2,619	534	242	261	225

Notes: Data from the 1998-2007 NHIS. Baseline sample is all immigrants whose head of household has a high school education or less and who moved to the US between 5 and 15 years before the survey year. The sample in columns 2-3 is the same as the baseline sample, except it conditions on different year of entry cutoffs as listed. The samples in columns 4-7 are the same as the baseline sample except they condition on different educational attainment cutoffs as listed. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. Standard errors are clustered at the state level and all results weighted using the sample weights. * p<.10, ** p<0.05, *** p<.01

Table 10. Correlation of Eligibility with Observable Characteristics

	<u>All Adults with High School Education or Less</u>		<u>Single Women with High School Education or Less</u>	
	Person File	Sample Adult File	Person File	Sample Adult File
<u>Outcome: Female</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	-0.003 (0.017)	0.066 (0.042)	-- --	-- --
<u>Outcome: White</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	0.059 (0.056)	0.037 (0.059)	0.045 (0.074)	0.140** (0.063)
<u>Outcome: Black</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	0.005 (0.028)	-0.011 (0.037)	0.002 (0.089)	-0.041 (0.097)
<u>Outcome: Asian</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	-0.016 (0.021)	-0.001 (0.031)	0.003 (0.031)	-0.003 (0.033)
<u>Outcome: Hispanic</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	-0.010 (0.037)	0.005 (0.041)	-0.090 (0.106)	-0.117 (0.105)
<u>Outcome: Number of Kids</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	-0.103 (0.128)	-0.150 (0.140)	-0.133 (0.191)	0.133 (0.307)
<u>Outcome: Married</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	-0.019 (0.043)	-0.069 (0.064)	-- --	-- --
<u>Outcome: Less than HS</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	0.009 (0.034)	-0.037 (0.040)	-0.031 (0.073)	-0.066 (0.139)
<u>Outcome: Age</u>				
Fraction of Past Year T.I. Eligible for Food Stamps	-1.300** (0.639)	-1.431 (0.859)	-0.944 (1.453)	-0.269 (1.744)

Notes: Data from the 1998-2007 NHIS. The sample is all immigrants aged 18-59 who moved to the US between 5 and 15 years before the survey year, and whose head of household has a high school education or less. All regressions included state and year fixed effects, as well as state by year controls for the unemployment rate, Medicaid/SCHIP generosity, and state SNAP program parameters. Standard errors are clustered at the state level and all results weighted using the sample weights. * $p < .10$, ** $p < 0.05$, *** $p < .01$

A. Data Appendix

We include controls for economic conditions and other safety net programs in our estimation models. Economic conditions are known to influence adult health and health behavior (see for example Ruhm 2000, Ruhm 2005), as do safety net programs (see for example Evans and Garthwaite 2014). We merge on to the NHIS information about states' unemployment rates, whether the state had an EITC or SCHIP program, maximum welfare benefits, other state Food Stamp policies, and income eligibility cutoffs for Medicaid and SCHIP for children by state.

We obtain unemployment rates from the Bureau of Labor Statistics. EITC information comes from the NBER TAXSIM. Dates on maximum welfare benefits are from Robert Moffitt (available here: <http://www.econ2.jhu.edu/people/moffitt/datasets.html>) . Information on other Food Stamp program changes—the frequency with which applications must be re-certified, whether in-person applications or re-certifications are required, state spending on outreach, broad based categorical eligibility, vehicle asset rules, and whether benefits are issued on debit cards, are all obtained from the USDA's SNAP Policy Database. The SCHIP program start dates are obtained from Rosenbach et al. (2001) and the Medicaid/SCHIP generosity measures come from Hoynes and Luttmer (2011), which are supplemented with information from the National Governor's Association.

Local attitudes regarding immigration may affect immigrants' program participation (Watson, 2014), so we follow Bronchetti (2014) and include two measures of state attitudes: 1) the fraction of individuals reporting they would like immigration decreased from the American National Election Studies (ANES), and 2) the number of deportation court cases per foreign-born individual from Transactional Records Access Clearinghouse (TRAC) Immigration Reports. The

ANES only includes census region identifiers, so we assign the same values to all states within the same region. Additionally, the ANES information is only available in “even” years, so we linearly interpolate in the missing years.

References

- Bronchetti, Erin Todd. 2014. “Public insurance expansions and the health of immigrant and native children.” *Journal of Public Economics*, 120: 205–219.
- Evans, William N, and Craig L Garthwaite. 2014. “Giving Mom a Break: The Impact of Higher EITC Payments on Maternal Health.” *American Economic Journal: Economic Policy*, 6(2): 258–90.
- Hoynes, Hilary W, and Erzo FP Luttmer. 2011. “The insurance value of state tax-and transfer programs.” *Journal of Public Economics*, 95(11): 1466–1484.
- Rosenbach, Margo, Marilyn Ellwood, John Czajka, Carol Irvin, Wendy Coupe, and Brian Quinn. 2001. “Implementation of the State Children’s Health Insurance Program: Momentum is increasing after a modest start.” First annual report submitted to the Centers for Medicare & Medicaid Services. Cambridge, MA: Mathematica Policy Research, Inc.
- Ruhm, Christopher J. "Are recessions good for your health?." *The Quarterly Journal of Economics* 115.2 (2000): 617-650.
- Ruhm, Christopher J. "Healthy living in hard times." *Journal of Health Economics* 24.2 (2005): 341-363
- Watson, Tara. 2014. “Inside the Refrigerator: Immigration Enforcement and Chilling Effects in Medicaid Participation.” *American Economic Journal: Economic Policy*, 6(3): 313–338.