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An apple a day? Adult food stamp eligibility and health care utilization among immigrants

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Researching the causes and consequences of unemployment

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

Upjohn Institute Working Paper 19-295

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ABSTRACT

In this study, we document the effect of food stamp access on adult health care utilization. While the Food Stamp Program provides one of the largest safety nets in the United States 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 physician visits. Additionally, we find that for single women, food stamps increased the affordability of specialty health care. These findings have important implications for cost-benefit analyses of the Food Stamp Program, as reductions in health care utilization because of food stamps may offset some of the program's impact on the overall government budget owing to the existence of government-provided health insurance programs such as Medicaid.

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

Key Words: Food stamps, immigrants, health care

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The Supplemental Nutrition Assistance Program (SNAP), previously named the Food Stamp Program, is one of the largest safety net programs in the United States.[1] 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 (U.S. Department of Agriculture 2017). However, the program has an uncertain future. For example, the 2017 executive budget proposed cutting federal spending on the program by $190 billion 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).[2] Moreover, immigrants' access to food stamps is currently being debated under the "public charge" rule (Parrott, Gonzales, and Schott 2018). If a federal policy objective is to reduce eligibility for food stamps with the goal of lowering federal spending, then the impact of program eligibility on participants' health care utilization is vital to cost-benefit analysis. Consider the possibility that food stamp eligibility may have effects on participants that lower their health care utilization. If this was the case, then tightening eligibility requirements could cause costs to rise in other safety net programs, such as Medicaid, undermining the government's cost savings from limiting the Food Stamp Program. In this study, we ask if such a relationship exists. Specifically, does food stamp eligibility have an impact on adult health care utilization?[3]

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[1] We use the name food stamps throughout, as this was the name of the program at the time period of our study.

[2] Several proposals for the 2018 Farm Bill have also sought to limit spending under the Food Stamp Program via work requirements; this policy debate is not yet resolved.

[3] There are several papers that touch on this topic through the Food Stamp Program's impact on children: East (2017a) finds that childhood access to food stamps improves health outcomes contemporaneously and in the short to medium run. Hoynes, Schanzenbach, and Almond (2016) find that childhood access to food stamps during the initial rollout of the program in the 1960s–1970s improved health outcomes in adulthood such as height and the prevalence of metabolic illnesses. 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. Finally, Berkowitz et al. (2017) and Samuel et al. (2018) document that food stamp participation is negatively correlated with adult health care utilization.

Adults are the largest group of food stamp benefit recipients, accounting for 51 percent of all recipients (Hoynes and Schanzenbach 2015). As such, any 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 $1,600 per capita on health care for female children aged 5–9, as opposed to $7,200 per capita on health care for female adults aged 45–49 (Institute for Health Metrics and Evaluation 2017).[4]

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 noncitizen immigrants ineligible for food stamps, an action that was gradually reversed by state and federal laws in the period between 1998 and 2003.[5] 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 2018b). Using an empirical strategy similar to studies by East (2018a,b), we take advantage of differing eligibility criteria across states and over time and verify using the Current Population Survey that 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. This requires us to limit our analysis population to

[4] For males, the per capita expenditures on health care were $1,900 for children aged 5–9, and $5,500 for adults aged 45–49.

[5] Undocumented immigrants were never eligible for food stamps and were therefore unaffected by these changes.

immigrants, which may limit the generalizability of our findings to the full population and causes us to have relatively small sample sizes that reduce the precision of our estimates. However, immigrants are a large and policy-relevant subpopulation—10 percent of food stamp participants prior to PRWORA were foreign born (East 2018b)—so we view this as a worthwhile trade-off to make in order to exploit quasi-experimental variation in food stamps, which has been challenging when studying the modern program.

We find that one year of eligibility decreases the likelihood of multiple physician office visits within a year among low-educated immigrants, and there is a negative and imprecisely estimated effect on the likelihood of any physician office visits. We find similarly suggestive negative effects on other measures of health care utilization—emergency room visits and hospitalizations. We also find evidence that for single low-educated women food stamps may reduce the likelihood of not utilizing specialty medical care because of cost. We examine whether these results could be driven by changes in health outcomes, and we find no consistent evidence that food stamps improve 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, and the subsamples with these chronic conditions are small. 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 percent of adult immigrants who

received food stamp benefits were also covered by the Medicaid program, so a reduction in physician visits could decrease Medicaid expenditures for this population.[6]

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 income effect as a mechanism is somewhat mixed, however; some studies find that food stamps are treated similar to a pure cash transfer (Bruich 2014; Currie 2003; Hoynes, McGranahan, and Schanzenbach 2015; Hoynes and Schanzenbach 2009; Moffitt 1989). On the other hand, Beatty and Tuttle (2014) and Hastings and Shapiro (2018) find that food stamps may cause 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.[8]

Food stamps could also have an impact on adult health care utilization through changes in individual health. However, their impact on health would need to be relatively immediate for this to have a contemporaneous impact on health care utilization. For example, changes in nutrition

[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 and thus 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.

[8] There is a separate and large literature looking at the effect of conditional cash transfer programs (such as Bolsa Família in Brazil) impact household consumption of health services. The general finding across multiple countries is of conditional cash transfers increasing health service utilization. See Fiszbein et al. (2009) for a review.

may affect body weight, and some studies find that food stamp eligibility increases the likelihood of obesity.[9] Much of this evidence, though, 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 stamp eligibility on their body mass index (BMI) (Kaushal 2007).[10] 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 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.

[9] Several studies find that food stamps increase the likelihood of obesity with varying magnitudes of effect (Baum 2011; Chen, Yen, and Eastwood 2005; Gibson 2003, 2006; Meyerhofer and Pylypchuck 2008; Townsend et al. 2001).

[10] We also investigate whether the same is true in our sample period described below, which is slightly different from that in Kaushal (2007) and thus uses slightly different policy variation. Our paper builds on Kaushal's findings by analyzing a longer time frame and a wider range of outcome variables.

The final possibility is that food stamps have 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, Ratcliffe, McKernan, and Zhang (2011) and Wilde and Nord (2005). See also reviews by Gregory, Rabbitt, and Ribar [2015] and Hoynes and Schanzenbach [2015]). Particularly relevant for our paper, Borjas (2004) documents that food insecurity increased after welfare reform for immigrants relative to natives, and attributes this to welfare-reform-induced reductions in safety net program participation among immigrants. Food insecurity has been identified in the medical and public health literatures as a predictor of increased health care utilization.[11] Most directly related to our hypothesis is a study by Seligman et al. (2014) of hospital admissions in California. They show 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.[12]

PRWORA AND FOOD STAMP ELIGIBILITY

The enactment of PRWORA in 1996 changed the federal food stamp eligibility criteria to exclude most documented noncitizen 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,

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

[12] Other studies find results supporting reductions in health care utilization on the days of benefit receipt. Cotti, Gordanier, and Ozturk (2016) find reductions in drunk driving fatalities, and Cotti, Gordanier, and Ozturk (2018) find reductions in emergency room utilization around the time of benefit receipt.

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.[13] Later, the 2002 Farm Bill restored federal eligibility to three groups of noncitizen immigrants: the disabled, children, and those who had lived in the United States for at least five years.[14] We show a timeline of the relevant changes to immigrant eligibility in Figure 1.

Loss of eligibility for noncitizen adults in a household did not necessarily cause households to lose all food stamp benefits. U.S.-born children of noncitizen 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 percent ($2,400 annually in 1998). This decrease in the benefit amount for households with children was large, so in practice these households may have 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

[13] 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).

[14] This discussion is drawn primarily from Bitler and Hoynes (2013), Capps (2004), and Zimmermann and Tumlin (1999).

do not differentiate between households with and without children or based on the country of birth of children.

There were several groups of noncitizen immigrants who were unaffected by the changes in eligibility criteria contained in PRWORA. Immigrants who had worked in the United States 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.[15] We define our primary sample of interest as those who were born outside the United States and U.S. territories, and who report coming to the United States "to stay" less than 15 years but more than 5 years before the survey. We call this group "treated immigrants." 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 United States 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]

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:

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

[15] Holders of temporary visas and undocumented immigrants were not eligible pre-PRWORA and remained ineligible post-PRWORA. Immigrants who entered the United States 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) for at least their first five years of U.S. residence (unless their state of residence provided these benefits with state funds).

[16] This also excludes immigrants who, because of PRWORA, would not qualify for other government assistance, such as Medicaid, because they have not lived in the United States for five years.

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, which is a vector of survey year and calendar quarter fixed effects to remove any seasonal effects (such as flu season).[17] We also include X_{ist}, a vector of individual controls for gender, age, race/ethnicity, year of entry to the United States, number of children under age 5, number of children, number of children born outside the United States, 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.[18] We cluster our standard errors by the state of residence and weight using the NHIS and CPS-provided survey weights to account for nonrandom 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 (2018a) finds no evidence that state fixed

[17] The CPS data are only available annually, so we omit the calendar quarter controls when using those data.

[18] Specifically, we control for the state by year eligibility thresholds (expressed as a fraction of the federal poverty line) for infants, children aged 6, and children aged 16 since this was a period of rapid expansion in childhood eligibility for these programs. In robustness checks below, we also include controls for adult Medicaid eligibility thresholds. We do not control for features of the WIC program as it does not vary over this time period, and as such the program's effect is differenced out of our analysis.

demographic or political characteristics predict a fill-in program; however, these characteristics are absorbed by the state fixed effects. More importantly, East (2018a) 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.

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.[19] The survey covers roughly 35,000 households annually and is nationally representative. 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. There are, however, several measurement issues with reported year of entry to the United States; therefore, this year of entry restriction should be interpreted as only a rough proxy for those likely to have experienced food stamp eligibility changes.[20] Our primary sample

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

[20] Year of entry information is based off a question about when foreign-born individuals came to the United States "to stay," and previous research has documented that for only about 50 percent of respondents does the year they report they came to the United States "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

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 2018b).[21] We follow the food stamp policy definition of "adults" and keep individuals aged 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 two 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 because of cost. To avoid issues of multiple hypothesis testing, we create a summary index that captures the four 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

most recent spell of time spent in the United States. For more information on these measurement issues, see Redstone and Massey (2004) and Lubotsky (2007). We assume that there are no systematic changes in this measurement error that are correlated with food stamp eligibility.

[21] We stratify by educational attainment rather than income because income is endogenous to food stamp availability because of labor supply responses (East 2018b).

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 (DeSalvo et al. 2006; Idler and Benyamini 1997). 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, hat 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 (Flood et al. 2015). 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. This information of food stamp receipt is collected at the household level, so we cannot distinguish which household members received the benefits.

We use the NHIS and CPS-provided weights throughout to account for survey oversampling and nonrandom nonresponse (Flood et al. 2015; National Center for Health Statistics 2005).

RESULTS

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. 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, who participated in food stamps at double the rates of all low-educated adults (12 percent vs. 24 percent). 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.[22] The point estimates 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

[22] It is important to note that food stamp receipt is underreported in the Annual Social and Economic Supplement (Meyer, Mok, and Sullivan 2009). If the underreporting is random, measurement error will result in an underestimate of the effect on program take-up. So, we view these estimated effects as likely lower bounds and therefore do not use these to calculate treatment on the treated effects, since these effects would be overestimated (Stephens and Unayama 2015).

roughly double the full low-educated sample. These results correspond with findings from East (2018b), who shows that eligibility caused low-educated immigrants to participate in food stamps at higher rates.[23]

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 affect 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

[23] We are using a slightly different sample than East (2018b) in terms of survey years and sample restrictions based on demographic characteristics. However, the results are similar: East (2018b) finds declines in food stamp participation of 1–8 percentage points. East (2018b) furthermore shows that eligibility caused married immigrant men to move from full-time to part-time work and single women to drop out of the labor force.

intensive margin for outpatient care when individuals are given Medicaid, as found by Finkelstein et al. (2012).[24]

Column 3 shows that for all adults, these effects are larger for the second or third annual visit, whereas for single women the effects reach into larger numbers of annual visits. For overnight hospitalizations or ER visits, we obtain point estimates that are also mostly negative (columns 5–7) but not statistically significant at conventional levels. [25] As such we are unable to rule out large reductions in utilization for these types of care, but in some cases also cannot rule out small increases in utilization as well. If the reduction in the number of doctor visits is because of better case management, we might expect to see changes in hospital or ER utilization, similar to Seligman et al. (2014) and Cotti, Gordanier, and Ozturk (2018); 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.[26]

The estimates on two or more physician visits imply intent to treat effects of 44–45 percent, which are quite large. However, there are several reasons to take caution when interpreting these estimates. First, the confidence intervals on the estimates are wide, which is not dissimilar to the large confidence intervals in other studies utilizing similar methods such as Borjas (2004) and Kaushal (2007). Additionally, we are cautious about interpreting the sample mean as the counterfactual incidence rate of two or more physician visits, because those who actually participate in food stamps are likely to be more disadvantaged than the full sample. For

[24] Finkelstein et al. (2012) also find effects on utilization for Medicaid on the extensive margin. It is difficult to compare magnitudes, as the utilization variables in Finkelstein et al. (2012) are continuous and ours are categorical.

[25] 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.

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

example, 3.6 percent of treated immigrants who have income below the poverty line report being diagnosed with diabetes, relative to 2.3 percent for the nonpoor. 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 the nonpoor sample.[27]

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—such as 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 because of 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 because of 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 are negative.[28] This suggests that one potential pathway for reduced doctor visits is through improved affordability of needed specialty care. It is important to note, however, that the

[27] Authors' calculations using the NHIS.

[28] 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.

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.

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 significant effect of food stamp eligibility on self-assessed health, and all point estimates actually suggest self-reported health is *worsening*, so this is unlikely to drive the result of decreased doctor visits. 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 significant effect on mental health, indicating that 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. However, we note that many of these estimates are accompanied by large standard errors.

Chronic Illness

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 because of 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 whether the individual reports having ever been diagnosed with a 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. 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. Many of these measures are uncommon, and therefore we have few individuals in our sample who experience them.[29] This suggests that these subsamples are unlikely to be driving our main results.

The results from this analysis are reported in Table 6. None of the interaction coefficients are statistically significant at conventional levels, and the pattern of results is not consistent either across conditions or across the two demographic groups. These estimates suggest that reductions in the utilization of health care owing to food stamp eligibility were not attributable 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 because of 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

[29] We report the sample mean of each of these measures of poor health in Table 6.

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 that a potential mechanism may be improved management of general health (as opposed to chronic conditions), due to increased resources, or improved nutrition.

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), 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 absorb any common shocks to health care that affect both natives and treated immigrants. In this model, we drop the uninteracted measure of treated immigrants' eligibility. These results are shown in the third column of Table 7 and provide similar estimates as the baseline model.[30]

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 2–5 of Table 8. First, we include controls for adult Medicaid eligibility—specifically, the eligibility thresholds of adults and parents expressed as fraction of the federal poverty line—and the results are nearly identical to the baseline.[31] Accounting for other state safety net generosity (maximum TANF benefits, presence of a SCHIP program, or a state EITC), and state attitudes toward immigrants do not substantively change the results. The inclusion of state SNAP options—online application, broad-based categorical eligibility, time requirements for reeligibility certification, face-to-face interview and recertification requirements, fingerprint requirements, and vehicle exemptions—beyond those in the baseline model (EBT issuance and outreach spending) cause the coefficient for single women to no longer be statistically

[30] These specification checks yield similar results when replicated for the other outcome variables in the results section. These are available on request.

[31] Further, explicit tests of food stamp eligibility on Medicaid enrollment show no effect (results available on request).

significantly different from zero. This is because of an increase in standard error as well as a slight decrease in the magnitude of the estimate, and the estimate is well within the confidence interval of the baseline result. 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 6, and the results are similar to the baseline.

We also conduct several specification checks on the main results, shown in columns 7–9 of Table 8. First, we drop all observations from California, as it 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. For example, these fixed effects will account for 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 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 demanding specification. Nevertheless, the results remain similar.[32]

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 United States more than 10 years, and more than 20 years

[32] 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 on request.

before the survey. The longer immigrants have been in the United States, the less likely they 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 United States. 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 measurement error in foreign-born individuals' year of arrival to the United States. 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.

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. We see little evidence of changes in self-reported physical or mental health that could explain these findings on doctor visits, and no evidence that this is driven by

individuals 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 that improved management of health care needs because of 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 percent of food stamp recipients in our population also received health insurance coverage through the Medicaid program,[33] 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.[34] 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 that 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 (0.144 × 64). This is a lower bound of 4 percent of total expenditures on food stamps per capita, indicating that a portion of government expenditures on food stamps may be recovered just through reductions in

[33] Authors' calculation using the Current Population Survey. Statistics calculated using the years 2004–2007, when eligibility was restored to the population of interest.

[34] 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.

doctor visits for adults.[35] However, this is conservative lower-bound, as office visits often contain other billed services, and as Medicaid payments are considerably less expensive than payments via Medicare or private insurance.

[35] 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.

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, 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 at http://www.econ2.jhu.edu/people/moffitt/datasets.html). Information on other food stamp program changes—the frequency with which applications must be recertified, whether in-person applications or recertifications 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 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 that 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.

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Figure 1 PRWORA Eligibility Timeline

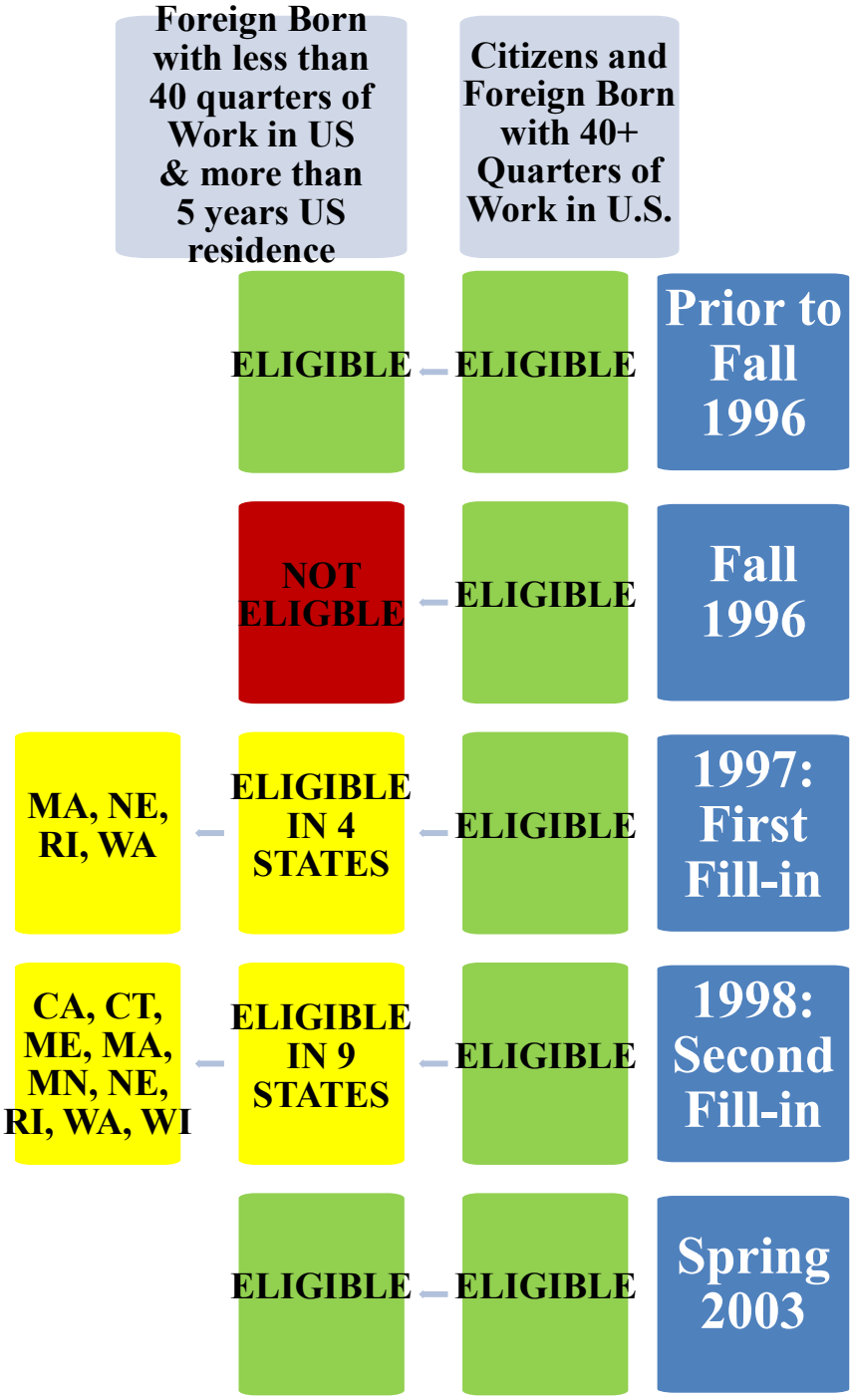

Table 1 Demographic Summary Statistics—NHIS

	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 that high school	0.65	0.66
Below poverty	0.15	0.33
Age	33.6	33.2

NOTE: The sample is all immigrants aged 18–59 who moved to the United States 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.
SOURCE: 1998–2007 NHIS.

Table 2 Effect of Food Stamp Eligibility on Food Stamp Receipt

	(1) Received food stamps last year	(2) Benefit amount received
	A: All adults with high school education or less	
Fraction of past year T.I. Eligible for food stamps	0.044***	85.750***
	(0.013)	(39.828)
Mean outcome variable	0.12	289.06
N	11,674	11,674
	B: Single women with high school education or less	
Fraction of past year T.I. Eligible for food stamps	0.096***	201.132***
	(0.032)	(78.151)
Mean outcome variable	0.24	611.17
N	2,785	2,785

NOTE: * p<0.10, ** p<0.05, *** p<0.01. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 CPS.

Table 3 Effect of Food Stamp Eligibility on Health Care Utilization

	(1) Any office visits	(2) 2+ office visits	(3) 4+ office visits	(4) 2+ office visits (conditional on any)	(5) Any overnight hospitalization	(6) Any ED visits	(7) 2+ ED visits
				A: All adults with high school education or less			
Fraction of past year T.I. eligible for food stamps	−0.022	−0.144***	−0.048	−0.244***	−0.015	−0.065	0.003
	(0.058)	(0.051)	(0.057)	(0.073)	(0.017)	(0.039)	(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
				B: Single women with high school education or less			
Fraction of past year T.I. eligible for food stamps	−0.142	−0.199***	−0.125*	−0.192**	−0.017	−0.031	−0.009
	(0.108)	(0.072)	(0.066)	(0.091)	(0.045)	(0.072)	(0.032)
Mean outcome Variable	0.611	0.442	0.144	0.724	0.112	0.188	0.070
N	764	764	764	478	1,218	770	770

NOTE: * p<.10, ** p<0.05, *** p<.01. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 NHIS.

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
	A: All adults with high school education or less					
Fraction of past year T.I. Eligible for food stamps	0.009	−0.093	0.001	−0.024	−0.011	0.002
	(0.026)	(0.160)	(0.028)	(0.021)	(0.028)	(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
	B: Single women with high school education or less					
Fraction of past year T.I. Eligible for food stamps	0.026	−0.847*	−0.084	−0.098**	−0.149*	−0.147
	(0.054)	(0.442)	(0.096)	(0.046)	(0.084)	(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

NOTE: * p<0.10, ** p<0.05, *** p<0.01. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 NHIS.

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

	(1) Overall health (1="excellent" … 5="poor")	(2) In "excellent" or "very good" health (binary)	(3) Overweight or obese (binary)	(4) Z-score summary index of mental health
		A: All adults with high school education or less		
Fraction of past year T.I. eligible for food stamps	0.064	−0.026	−0.081	0.020
	(0.066)	(0.033)	(0.051)	(0.060)
Mean outcome variable	2.173	0.614	0.583	0.016
N	6,649	6,649	2,883	3,017
		B: Single women with high school education or less		
Fraction of past year T.I. eligible for food stamps	0.207	−0.055	−0.018	0.220
	(0.129)	(0.059)	(0.117)	(0.207)
Mean outcome Variable	2.311	0.556	0.503	−0.307
N	1,218	1,218	727	761

NOTE: * p<0.10, ** p<0.05, *** p<0.01. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 NHIS.

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

		Interact eligibility with chronic condition			
	(1)	(2)	(3)	(4)	(5)
	Baseline	Diabetes	Hyper-tension	Heart disease, obesity, diabetes or hypertension	Self-reported "poor" or "fair" health
Outcome: 2+ office visits in past year					
		A: All adults with high school education or less			
Fraction of past year T.I. Eligible for food stamps	−0.144***	−0.154***	−0.131**	−0.130**	−0.153***
	(0.051)	(0.049)	(0.052)	(0.053)	(0.054)
Fraction of past year T.I. Eligible for food stamps × chronic condition		0.170	−0.059	−0.004	0.035
		(0.116)	(0.076)	(0.074)	(0.115)
Mean of chronic measure		0.03	0.079	0.1	0.076
N		3,013	3,021	3,026	3,026
Outcome: 2+ office visits in past year					
		B: Single women with high school education or less			
Fraction of past year T.I. Eligible for food stamps	−0.199***	−0.186**	−0.213**	−0.201**	−0.206***
	(0.072)	(0.075)	(0.080)	(0.084)	(0.073)
Fraction of past year T.I. Eligible for food stamps × chronic condition		−0.156	0.126	0.035	0.046
		(0.159)	(0.196)	(0.177)	(0.095)
Mean of chronic measure		0.04	0.101	0.123	0.104
N		761	762	764	764

NOTE: * p<0.10, ** p<0.05, *** p<0.01. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 NHIS.

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

	(1)	Triple difference (2)	Triple difference (3)
	Baseline	Without state by year fixed effects	With state by year fixed effects
Outcome: 2+ office visits in past year			
	A: All adults with high school education or less		
Fraction of past year T.I. eligible for food stamps		−0.005	
		(0.010)	
Fraction of past year T.I. eligible for food stamps × treated immigrant	−0.144***	−0.135**	−0.137**
	(0.051)	(0.052)	(0.054)
N	3,026	65,900	65,900
Outcome: 2+ office visits in past year			
	B: Single women with high school education or less		
Fraction of past year T.I. eligible for food stamps		0.022	
		(0.023)	
Fraction of past year T.I. eligible for food stamps × treated immigrant	−0.199***	−0.232***	−0.237***
	(0.072)	(0.073)	(0.075)
N	764	19,951	19,951

NOTE: * p<0.10, ** p<0.05, *** p<0.0. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 NHIS.

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

				State by year controls			Specification checks		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline	Adult Medicaid generosity	Other safety net program generosity	Attitudes towards immigrants	Other sate SNAP options	State linear time trends	Drop California	Include census region by year fixed effects	Include year by calendar month fixed effects
Outcome: 2+ office visits in past year									
				A: All adults with high school education or less					
Fraction of past year T.I. eligible for food stamps	−0.144***	−0.146***	−0.155***	−0.159***	−0.142**	−0.219**	−0.160*	−0.107	−0.130***
	(0.051)	(0.051)	(0.057)	(0.057)	(0.061)	(0.082)	(0.086)	(0.069)	(0.044)
N	3,026	3,026	3,026	3,026	3,026	3,026	2,259	3,026	3,026
Outcome: 2+ office visits in past year									
				B: Single women with high school education or less					
Fraction of past year T.I. eligible for food stamps	−0.199***	−0.214***	−0.207**	−0.265***	−0.137	−0.331***	−0.192	−0.128	−0.202**
	(0.072)	(0.075)	(0.083)	(0.085)	(0.137)	(0.113)	(0.117)	(0.100)	(0.089)
N	764	764	764	764	764	764	575	764	764

NOTE: * p<0.10, ** p<0.05, *** p<0.01. The sample is all immigrants aged 18–59 who moved to the United States 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 United States, 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.
SOURCE: 1998–2007 NHIS.

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

	Year of entry				Education		
	(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
Outcome: 2+ office visits in past year							
				A: All adults			
Fraction of Past Year T.I. Eligible for Food Stamps	−0.144***	−0.001	−0.031	−0.144*	−0.103	0.176*	0.041
	(0.051)	(0.025)	(0.027)	(0.075)	(0.096)	(0.095)	(0.066)
N	3,026	20,202	10,324	2,115	932	762	1,144
Outcome: 2+ office visits in past year							
				B: Single women			
Fraction of Past Year T.I. Eligible for Food Stamps	−0.199***	−0.107**	−0.118***	−0.192**	−0.207	−0.195	−0.072
	(0.072)	(0.037)	(0.046)	(0.094)	(0.202)	(0.187)	(0.236)
N	764	4,805	2,619	534	242	261	225

NOTE: * p<0.10, ** p<0.05, *** p<0.01. 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.
SOURCE: 1998–2007 NHIS.

Table 10 Correlation of Eligibility with Observable Characteristics

	All adults with high school education or less		Single women with high school education or less	
	Person file	Sample adult file	Person file	Sample adult file
Outcome: Female				
T.I. Eligible for Food Stamps	−0.003	0.066	––	––
	(0.017)	(0.042)	––	––
Outcome: White				
T.I. Eligible for Food Stamps	0.059	0.037	0.045	0.140**
	(0.056)	(0.059)	(0.074)	(0.063)
Outcome: Black				
T.I. Eligible for Food Stamps	0.005	−0.011	0.002	−0.041
	(0.028)	(0.037)	(0.089)	(0.097)
Outcome: Asian				
T.I. Eligible for Food Stamps	−0.016	−0.001	0.003	−0.003
	(0.021)	(0.031)	(0.031)	(0.033)
Outcome: Hispanic				
T.I. Eligible for Food Stamps	−0.010	0.005	−0.090	−0.117
	(0.037)	(0.041)	(0.106)	(0.105)
Outcome: Number of Kids				
T.I. Eligible for Food Stamps	−0.103	−0.150	−0.133	0.133
	(0.128)	(0.140)	(0.191)	(0.307)
Outcome: Married				
T.I. Eligible for Food Stamps	−0.019	−0.069	––	––
	(0.043)	(0.064)	––	––
Outcome: Less than HS				
T.I. Eligible for Food Stamps	0.009	−0.037	−0.031	−0.066
	(0.034)	(0.040)	(0.073)	(0.139)
Outcome: Age				
T.I. Eligible for Food Stamps	−1.300**	−1.431	−0.944	−0.269
	(0.639)	(0.859)	(1.453)	(1.744)

NOTE: * p<0.10, ** p<0.05, *** p<0.01. The sample is all immigrants aged 18–59 who moved to the United States 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.
SOURCE: 1998–2007 NHIS.