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Food Insecurity in the U.S.: Does Citizenship and Birthplace Matter?

Rita B. Thomson, *Georgia State University*

Abstract: Studies generally show higher rates of food insecurity among the immigrant population in the U.S. than among the native born, but often no distinction regarding citizenship and birthplace is made. Nor is the fact that households are often a mixture of foreign born and native born considered. Here data from years 2014-2017 of the Current Population Survey are used to examine household food insecurity in association with household citizenship type and receipt of food assistance. Foreign birth is not always associated with greater risk of food insecurity. Of households including foreign born individuals, only households composed entirely of noncitizens are more likely to be food insecure than households of U.S. mainland born citizens. Households composed entirely of birth citizens, with at least one born in U.S. territories, are also more likely to be food insecure. In contrast, households composed entirely of naturalized citizens are less likely to be food insecure. Also households containing a noncitizen, no adult citizen, and a child citizen are less likely to be food insecure.

Keywords: Food security; Immigrants; Puerto Ricans; SNAP; United States; Citizenship status

Food security is necessary for health and good nutrition (Coleman-Jensen et al. 2018). In contrast, food insecurity is associated with depression, poor mental health, obesity, and chronic disease (Huang et al. 2018, Kapulsky et al. 2015, Nunnery et al. 2015).

To date, most research on immigrant food insecurity in the United States has been limited to a focus on a particular nationality or ethnicity (Dharod, et al. 2013, Maxwell et al. 2015, Nunnery et al. 2015), on immigrants in a particular geographic area (Gany et al. 2014, Nalty et al. 2013), or on particular household members (Cook 2013, Van Hook and Balistreri 2006). Benefits from the Supplemental Nutrition Assistance Program (SNAP), the nation's premier defense against food insecurity (Gray and Kochhar 2015), are given by household. Noncitizens have more restricted access to SNAP than citizens, and some noncitizens are categorically ineligible (USDA 2011). Often households contain a mixture of citizens and noncitizens, yet whether the

mixture of statuses within household affects household food insecurity is often not known or not specified.

There is evidence that individuals who are U.S. citizens by reason of birth in U.S. territories are at higher risk of food insecurity than those born on the U.S. mainland (Rabbitt et al. 2016). However, most research contrasts the native born with the foreign born, and it is uncertain whether native born includes those born in U.S. territories. Including the territorial born may cause the native born to have a higher food insecurity rate. Excluding the territorial born leaves some U.S. citizens out of the analysis.

This paper extends the prior literature by examining types of families based on combinations of foreign born and native born considering all household members and asks: Which household type is most likely to experience food insecurity? Data from four years of the nationally representative Current Population Survey (CPS) are used with a focus on citizenship status while

also examining or controlling for additional factors shown by prior research to be associated with food insecurity. Analysis shows foreign birth is not always associated with greater risk of food insecurity and sometimes is associated with less risk. Overall food insecurity declined from 2014 to 2017.

Background

Food Insecurity

People are food insecure if they do not at all times have access to enough food for an active, healthy life. In 2014, 14.0% of U.S. households reported food insecurity at some time during the year (Coleman-Jensen et al. 2015). By 2017, only 11.8% of households reported food insecurity (Coleman-Jensen et al. 2018). Food insecurity is measured annually in December by the Food Security Supplement of the CPS administered by the Bureau of Census. Food insecurity in a household does not necessarily mean all individuals are equally affected as children are often protected from it (Anderson et al. 2014).

Food insecurity, as might be expected, is higher among the poor, and additionally varies by race and ethnicity (Coleman-Jensen et al. 2018). The 2017 food insecurity rates of 21.8% for non-Hispanic black households and 18.0% for Hispanic households are well above the 11.8% average national rate (Coleman-Jensen et al. 2018). These contrast with the 8.8% food insecurity rate of non-Hispanic white households. I am interested in the influence of citizenship in addition to ethnicity or race. Of the Hispanic population, 65.1% are U.S. citizens by birth, 11.7% are naturalized citizens, and 23.2% are noncitizens (Stepler and Brown 2016). The food insecurity rates of Hispanic individuals vary by ethnic origin with Puerto Ricans, who are U.S. citizens by birth, having higher rates than certain Hispanic immigrant groups (Chávez et al. Kim 2007, Fuster 2018; Rabbitt et al. 2016).

Undocumented immigrants, of whom Mexicans make up just over half, constituted 23.7% of the foreign born in the United States in 2016 (Passel and Cohn 2018). Undocumented immigrants are not eligible for naturalization, but even legal immigrant Mexicans, eligible for naturalization, naturalize at a lower rate than immigrants in general with only 36% of Mexicans naturalized in contrast to over half of all legal foreign

born residents (Gonzalez-Barrera et al. 2013). The high rate of food insecurity among Hispanics may partially result from the large number of noncitizens among them. Although undocumented noncitizens are never eligible for SNAP, they may receive food assistance from private programs, families can participate in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and undocumented children can participate in the National School Lunch Program and School Breakfast Program (Minkoff-Zern 2014, Moos 2008).

An undocumented status is not the only reason immigrants may be food insecure. Refugees, a subgroup of immigrants, are fully documented and eligible for work and assistance on arrival, yet often experience food insecurity. (Dharod et al. 2013, Kiptinness and Dharod 2011, Nunnery et al. 2015, Patil et al. 2010). Whether the refugees in any of these studies were naturalized citizens or noncitizens is not recorded.

Households with children, in 2017, have a food insecurity rate of 15.7%, higher than the 11.8% average rate for all households (Coleman-Jensen et al. 2018). Children are more likely to be food insecure in a single parent household than in a married couple household. In addition to income, race or ethnicity, and family type, two other factors associated with child food insecurity are a poorly educated mother and living with a disabled person (Anderson et al. 2014, Gundersen and Ziliak 2014, Kalil and Chen 2008).

Literature indicates that children of immigrants experience greater levels of food insecurity than the children of native born parents even after considering income, race or ethnicity, and marital status of household head (Anderson et al. 2014, Cook 2013, Gundersen and Ziliak 2014, Kalil and Chen 2008, McLauren and Liebman 2012, Rubio et al. 2019). Additional factors associated with food insecurity of children of immigrants include larger household size (Anderson et al. 2014, Kalil and Chen 2008, Maxwell et al. 2015) and less receipt of SNAP or other food assistance (Gundersen and Ziliak 2014, Nalty et al. 2013). These studies of children of the foreign born often do not consider the citizenship status of all household members.

SNAP Policies and the Foreign Born

SNAP benefits are available to households that have low income, limited assets, meet citizenship or immigrant status requirements, and meet employment requirements (USDA 2018). According to U.S. Department of Agriculture guidelines, noncitizens must show they are legally admitted, “qualified aliens” to be eligible for SNAP (USDA 2011). Most qualified alien noncitizens must meet a residency or work requirement before they are eligible for SNAP consisting of five years residency or 40 quarters of work. Some qualified aliens, such as refugees, asylees, children under 18, trafficking victims, and certain others, need not meet the five year residency requirement but are immediately eligible. Undocumented noncitizens and noncitizens with a temporary, non-immigrant status are not eligible for SNAP. American citizen children of undocumented parents are eligible for SNAP, and the parents can apply on their children’s behalf without revealing their own immigration status (USDA 2011).

Households or individuals who have low income and are otherwise qualified to receive SNAP benefits do not always participate in the program. The participation rate of eligible noncitizen households is estimated to be about 30% lower than the participation rate of the general population in 2014 (Gray and Cunyningham 2016).

Immigration enforcement policies and deportations have created fear and stigma which are felt even by legal immigrants (Capps and Fix 2013, Potochnick et al. 2017). Deportations have removed mainly men, leaving behind families that become less economically stable and more food insecure (Potochnick et al. 2017). There are instances of undocumented parents of citizen children, fearing deportation, asking to be removed from SNAP and food pantry roles (Dewey 2017).

On the other hand, naturalized citizens are better educated, have higher median household income, and the same home ownership rate as birth citizens (Zong and Batalova 2016). One might expect food insecurity rates similar to the native born.

This study adds to existing knowledge about food insecurity of the foreign born at the nationwide level. Food insecurity, measured by the nationally

representative CPS over four years’ time, is analyzed by household citizenship status as determined by the citizenship status of all household members not just by that of the reference person. Although, the CPS collects information about citizenship status of all individuals, it does not allow one to distinguish the admission status of foreign born individuals, whether they were admitted as refugees, possess other permanent legal status, possess temporary legal status, or are undocumented. In addition to employing household citizenship status, this study seeks a broader understanding than is presented in existing studies which often focus on one geographic area, one ethnic group, or one specific household configuration. The household is the unit that receives or does not receive SNAP and the unit for which food insecurity is measured in the CPS.

After controlling for variables known to affect food insecurity, income, race or ethnicity, sex and marital status, household size, education, presence of children, and presence of a disabled person, it is hypothesized:

H1: Households composed of naturalized citizens will not be statistically significantly different in food insecurity from those of U.S. mainland birth citizens.

H2: Households composed of a combination of U.S. mainland birth and naturalized citizens will not be statistically significantly different in food insecurity from those of U.S. mainland birth citizens.

H3: Households composed of both citizens and noncitizens with an adult citizen will not be statistically significantly different in food insecurity from those of U.S. mainland birth citizens.

H4: Households consisting of all citizens with at least one U.S. territorial birth citizen will be statistically significantly more food insecure than those of U.S. mainland birth citizens.

H5: Households consisting entirely of noncitizens will be statistically significantly more food insecure than households composed entirely of U.S. mainland birth citizens.

H6: Households composed of both citizens and noncitizens with a child citizen and no adult citizens will be statistically significantly

more food insecure than those of U.S. mainland birth citizens.

H7: Receiving food assistance will attenuate but not eliminate differences in food insecurity between household citizenship types.

Methods

Data

Data from the December CPS for the years 2014, 2015, 2016, and 2017 are used in this study. Residents of group quarters and those who gave no response to the Food Security Supplement are excluded from analysis. The sample consists of 106,018 individuals in 43,105 households in 2014, 97,065 individuals in 39,773 households in 2015, 99,742 individuals in 40,947 households in 2016, and 89,830 individuals in 37,255 households in 2017.

The CPS defines household as consisting of “all persons who occupy a house, an apartment, or other group of rooms, or a room, which constitutes a housing unit” (U. S. Census Bureau 2019, 4-3). The householder is “the person (or one of the persons) in whose name the housing unit is owned or rented (maintained) . . . If the house is owned or rented jointly by a married couple, the householder may be either the husband or the wife. The person designated as the householder is the ‘reference person’ to whom the relationship of all other household members, if any, is recorded” (U. S. Census Bureau 2019, 4-3). Here “householder(s)” is used to mean the reference person, or if a spouse is present, the reference person and spouse.

All individuals have valid, non-missing data for age, sex, citizenship status, and year of entry into the United States. All reference persons and spouses have valid, non-missing data for years of education. Food insecurity is measured by household based on one individual in each household answering the food supplement questions. The answers given are populated through all cases for that household (U.S. Census Bureau 2019). Households that are assumed not to be food insecure based on answers to preliminary questions are not asked all the questions, therefore the questions about receipt of SNAP and about assistance from other forms of food aid often have missing data. How this missing data is handled is discussed below.

Constructs

The dependent variable, food insecurity, is determined by the answers to a set of 18 questions in the survey supplement (Coleman-Jensen et al. 2018). All the questions specify that less food was consumed because of a lack of money. There are several points at which a respondent may be screened out if no indication of food insecurity has been given; the household is assumed to be food secure and the remaining questions are not asked (U.S. Census Bureau 2019). In the CPS, households are classified as having either full, marginal, low, or very low food security. I create a dichotomous variable for food insecurity as is frequently done (Coleman-Jensen et al. 2018, U.S. Census Bureau 2019). I group low and very low food security together as “food insecure,” value 1, and group full and marginal food security together as “not food insecure,” value 0.

The main independent variable is household citizenship type which is created by recoding the citizenship type of all individuals and then aggregating by household. In the CPS, each individual’s citizenship is recorded in one of five categories: native born in the United States, native born in Puerto Rico or U.S. outlying area, native born abroad of U.S. parents, foreign born naturalized citizen, or foreign born noncitizen. I combine native born in the United States and native born abroad of U.S. parents into U.S. mainland birth citizen. Therefore, the citizenship of each individual is recoded into one of four types: U.S. mainland birth citizen, U.S. territorial birth citizen, naturalized citizen, or noncitizen. Children differ from adults in eligibility for SNAP, therefore I recode whether an individual is an adult or child along with citizenship type, giving four adult individual citizenship types and four child individual citizenship types. Cases are then aggregated by household.

After aggregation by household, I have counts of the number of individuals in each citizenship category, and then recode the household citizenship type. Initially 16 household citizenship categories were created. Some of these household citizenship types had very few cases and others had very similar food security statuses; therefore, the citizenship categories were reduced to the following seven. These are coded as dummy variables.

1. U.S. mainland birth citizen – All household members are citizens by birth either in the U.S. mainland or abroad of U.S. parents. This is used as the reference category.
2. Naturalized citizen – All household members are naturalized citizens.
3. Mixed citizen – All household members are citizens in some combination of U.S. mainland birth and naturalized citizens. No household members are of territorial birth.
4. Noncitizen – All household members are noncitizens.
5. U.S. territorial birth citizen – All household members are citizens by birth and at least one of them was born in a U.S. territory
6. Noncitizen with adult citizen – Household contains at least one noncitizen and an adult citizen.
7. Noncitizen with child citizen – Household contains at least one noncitizen and a child citizen. It does not contain an adult citizen.

Since food insecurity overall declined during the four years, dummy variables are created for each year to determine if year is significant.

When creation of the household case is complete the other control variables are as described here. There are dummy variables for married householders, single male householder, and single female householder. Cross tabulation shows the food insecurity rates for households headed by a married person with spouse absent are similar those of households headed by a single person, and both types differ from households headed by a married person with spouse present. Therefore, if a householder is recorded as married, but the spouse is not present, the household is treated as if headed by a single individual. There are dummy variables for householder education and householder race created from the information of the referent, or referent and spouse when both are present. More education is associated with less food insecurity. To allow households where both spouses have higher education to be distinguished from households where only one does, householder education is that of the less educated spouse. Hispanic ethnicity is treated as a race. Householder race is the race of both spouses if they are

the same race; otherwise, it is coded “non-Hispanic other race.” This category also includes householders of mixed race, American Indian, Alaskan Native, Hawaiian, and Pacific Islander race. “Children present” is a dummy variable with value 1 if there are any individuals under age 18 in the household. “Disabled person present” is a dummy variable with value 1 if there are any disabled persons in the household. The CPS contains questions about receipt of eight forms of food assistance; the responses are combined into three dummy variables. Households that are not food insecure are screened out before these questions are asked, and food insecure households may not remember all assistance received. An affirmative response to these questions probably reflects actuality and is coded as a “yes.” Any other response is coded as a “no,” but is vague in meaning as the actual response may have been no, don’t know, refused, or missing. “Received SNAP” is specifically about SNAP. “Received other governmental assistance” records receipt of school lunch, school breakfast, or WIC in the last 30 days. “Received non-governmental assistance” records receiving food from a food bank or soup kitchen in the last 12 months or receiving food from meals on wheels or a community program in the last 30 days. “Below 185% of poverty” is a value taken directly from a CPS variable. Household income is a continuous variable recorded in 1,000s; it is set to the midpoint of the household income range in the CPS. Household size is also continuous and is top coded with nine meaning nine or more as there are very few households with more than nine members.

Household cases from the four years are combined into one dataset which contains 161,080 cases. Some households, 25.2%, are present in two years. As a household may have a different food insecurity status and a different citizenship status in a different year, I retain these “duplicate” households. Analysis was also run with these the “duplicates” removed with similar results.

Analysis

I use logistic regression because the dependent variable, food insecurity, is a dichotomous variable. This regression shows the odds of a household being food insecure to it not being food insecure relative to the reference category, U.S. mainland birth citizen when all

the control variables are included. The controls are variables known to be associated with food insecurity: race, education, household size, income, sex and marital status, presence of children, and presence of a disabled person. The year dummies are also included in all models. I ran four models. Model 1 regresses food insecurity on the household citizenship dummy variables and the control variables. Model 2 includes all variables in Model 1 and the receipt of SNAP. Model 3 includes all variables in Model 2 and receipt of governmental assistance. Model 4 includes all variables in Model 3 and receipt of nongovernmental assistance. The reference categories in the models are U.S. mainland birth citizen household, non-Hispanic white, bachelor's degree or more, married householders, and year 2017.

Results

Table 1 shows the univariate characteristics of all the variables included in the analyses. The food insecurity rate for the sample declines steadily from 13.7% in 2014 to 11.6% in 2017. Of the 161,080 households in the sample, 12.5% are food insecure and 87.5% are not. Median household income is \$55,000; mean household income is \$62,498 (SE .112); median household size is 2.0; mean household size is 2.4 (SE.004). Of U.S. mainland birth citizen households, 12.3% are food insecure while 87.7% are not. Mixed citizen households have a 9.4% food insecurity rate, the lowest rate of all the household citizenship types. Naturalized citizen households also have a low rate; 9.5% are food insecure. Noncitizen households have a food insecurity rate of 15.6%. Households containing a noncitizen and an adult citizen have a 14.5% food insecurity rate, while those containing a noncitizen and a child citizen have a food insecurity rate of 24.5%. Households containing at least one U.S. territorial birth citizen have a food insecurity rate of 25.1%, the highest rate of all the household citizenship types.

Figure 1 illustrates the food insecurity rate by household type by year. In all years, noncitizen with child citizen households and U.S. territorial birth citizen households have rates well above those of U.S. mainland birth citizen households, while noncitizen households and noncitizen with adult citizen households have rates slightly above U.S. mainland birth citizen households. Mixed citizen households in

all years and naturalized citizen households in three of the years have rates of food insecurity below those of U.S. mainland birth citizen households. In 2017, naturalized citizen households have a food insecurity rate of 11.4% which is almost equal to the 11.3% rate of U.S. mainland birth citizen households.

Figure 2 illustrates the receipt of SNAP by household type by year. Noncitizen with child citizen households and U.S. territorial birth citizen households have rates well above those of U.S. mainland birth citizen households, while noncitizen with adult citizen households have rates slightly above U.S. mainland birth citizen households. However, noncitizen households, naturalized citizen households, and mixed citizen households all have rates of receipt of SNAP below those of U.S. mainland birth citizen households.

Table 2 shows the odds ratios of the specified types of households being food insecure when compared to the reference categories with 95 % confidence intervals. Both year 2014 and year 2015 differ significantly statistically from referent year 2017 in all the models. This reflects the overall decline in food insecurity over the four years. The control variables are not shown because all control variables are statistically significant ($p < .001$) in all models as expected based on existing literature. Households headed by a single person, householder(s) education less than a bachelor's degree, race other than non-Hispanic white, children present, disabled person present, below 185% of poverty, and greater household size are all associated with greater odds of food insecurity. Increased household income is associated with decreased odds of food insecurity.

Model 1 includes only the control variables and the household citizenship types in addition to the year variables. It shows a statistically significant difference in the association of household citizenship type and food insecurity for all other household types compared to U.S. mainland birth citizen households. On average noncitizen households and households containing a territorial birth citizen are more likely to be food insecure, with respective odds of 1.217 and 1.288, compared to U.S. mainland birth citizen households. However, naturalized citizen, mixed citizen, noncitizen with adult citizen, and noncitizen with child citizen households are statistically significantly less likely to be

Table 1. Characteristics of Households

	Total	Food Insecure	
	N	%	N
Food Insecurity	161,080	12.5	20,177
Household Citizenship Status			
U.S. Mainland Birth Citizen	136,972	12.3	16,851
Naturalized Citizen	3,713	9.5	351
Mixed Citizen	7,166	9.4	671
Noncitizen	3,575	15.6	558
Noncitizen with Adult Citizen	6,233	14.5	902
Noncitizen with Child Citizen	2,513	24.5	616
U.S. Territorial Birth Citizen	908	25.1	228
Marital Status and Sex of Householder(s)			
Married	78,783	7.5	5,892
Single Male	33,527	14.5	4,874
Single Female	48,770	19.3	9,411
Education of Householder(s)			
Bachelor's Degree or More	45,509	4.5	2,031
Some College	46,145	13.3	6,125
High School	50,875	14.5	7,354
Less than High School	18,551	25.2	4,667
Race of Householder(s)			
Non-Hispanic White	114,369	10.0	11,454
Hispanic	14,623	21.1	3,084
Non-Hispanic Black	16,106	23.8	3,829
Non-Hispanic Asian	5,823	6.3	365
Non-Hispanic Other	10,159	14.2	1,445
Other Characteristics of Household			
Children Present	47,622	17.0	8,102
Disabled Person Present	35,550	21.9	7,787
Received SNAP	15,304	51.7	7,917
Received Other Governmental Asst.	12,268	49.1	5,410
Received Non-governmental Asst.	10,382	58.0	6,021
Below 185% of Poverty	47,582	28.8	13,681
Year 2014	43,105	13.7	5,913
Year 2015	39,773	12.7	5,068
Year 2016	40,947	11.9	4,803
Year 2017	37,255	11.6	4,303

food insecure, with respective odds of .825, .871, .891, and .849, compared to U.S. mainland birth citizen households.

Model 2 adds receipt of SNAP. Households that receive SNAP are more likely to be food insecure. SNAP

contributes to food security for these households, but many still experience food insecurity because other needs cause great financial stress (Anderson et al. 2014, Ratcliffe et al. 2011). With SNAP contributing to their food security, U.S. mainland birth citizen households and U.S territorial birth citizen households, as well as

Figure 1.

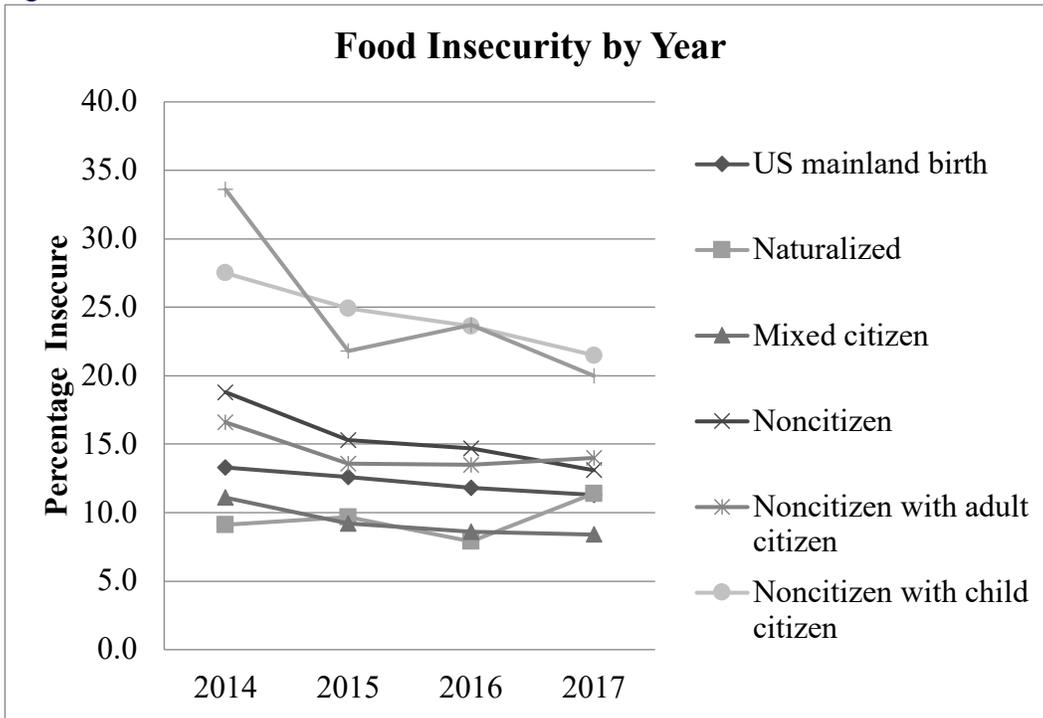


Figure 2.

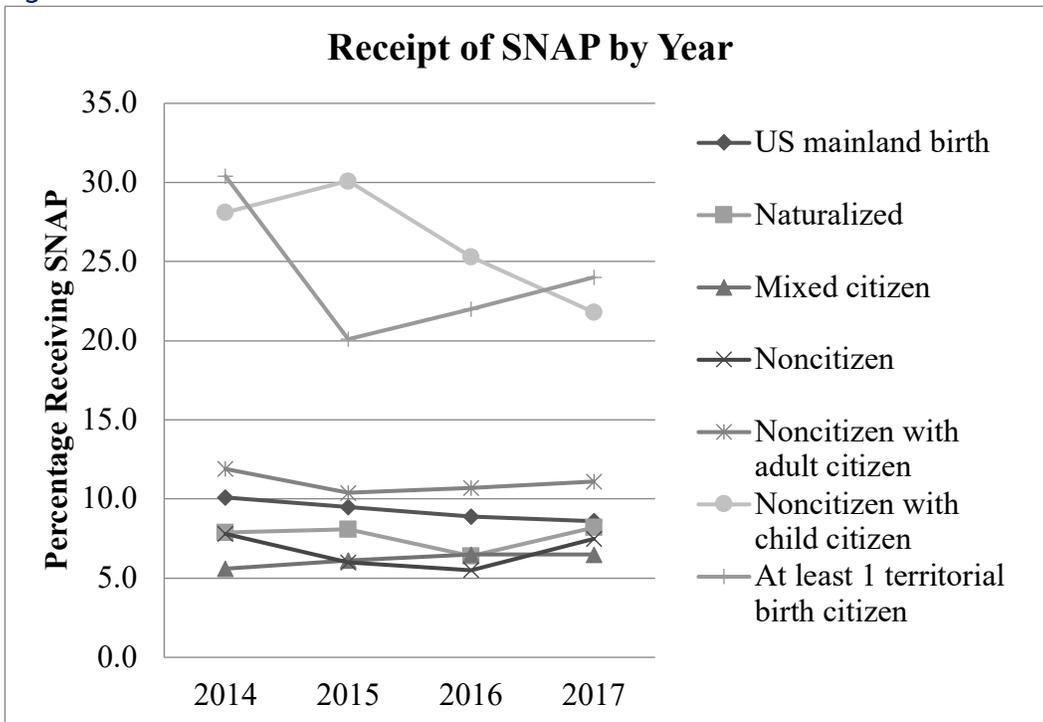


Table 2. Bivariate Logistic Regression Results Predicting Food Insecurity

	Model 1	Model 2	Model 3	Model 4
	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio
	95% C.I.	95% C.I.	95% C.I.	95% C.I.
Independent Variables				
Household Citizenship Status				
Naturalized Citizen ^a	0.825** (0.730-0.932)	0.820** (0.724-0.930)	0.830** (0.733-0.940)	0.856* (0.754-0.973)
Mixed Citizen ^a	0.871** (0.793-0.957)	0.940 (0.854-1.035)	0.964 (0.875-1.062)	1.008 (0.914-1.112)
Noncitizen ^a	1.217*** (1.093-1.355)	1.370*** (1.229-1.528)	1.390*** (1.246-1.549)	1.459*** (1.307-1.630)
Noncitizen with Adult Citizen ^a	0.891* (0.815-0.974)	0.982 (0.897-1.076)	0.975 (0.890-1.069)	1.022 (0.931-1.122)
Noncitizen with Child Citizen ^a	0.849** (0.758-0.951)	0.876* (0.779-0.986)	0.802*** (0.711-0.904)	0.833** (0.737-0.941)
U.S. Territorial Birth Citizen ^a	1.288** (1.084-1.531)	1.165 (0.972-1.396)	1.186 (0.988-1.422)	1.232* (1.024-1.482)
Year 2014 ^b	1.117*** (1.067-1.170)	1.117*** (1.066-1.171)	1.117*** (1.065-1.171)	1.124*** (1.070-1.180)
Year 2015 ^b	1.063* (1.013-1.114)	1.061* (1.010-1.113)	1.063* (1.012-1.116)	1.060* (1.008-1.114)
Year 2016 ^b	1.019 (0.971-1.068)	1.019 (0.970-1.070)	1.021 (0.972-1.072)	1.022 (0.972-1.074)
Received SNAP		3.556*** (3.406-3.711)	3.235*** (3.096-3.380)	2.525*** (2.411-2.644)
Received Other Governmental Assistance			1.861*** (1.750-1.978)	1.824*** (1.713-1.941)
Received Non-governmental Asst.				4.407*** (4.197-4.627)
Constant	-3.057	-2.952	-2.868	-2.939
Nagelkerke R Square	.260	.293	.297	.331

^a reference U.S. Mainland Birth Citizen Household.

^b reference year 2017

* p ≤ .05, ** p ≤ .01, *** p ≤ .001.

Note: Control variables are included in all models. The control variables are not shown here because all control variables are significant p ≤ .001 in all models. For the control variables, the reference categories are married householders, education Bachelor's degree or more, and non-Hispanic white race. The variables single male householder, single female householder, education some college, education high school, education less than high school, Hispanic race, non-Hispanic black race, non-Hispanic Asian race, non-Hispanic other race, children present, disabled person present, below 185% of poverty, and larger household size all signified greater likelihood of food insecurity. Higher income signified less likelihood of food insecurity.

mixed citizen households and noncitizen with adult citizen households, are no longer statistically significantly different from each other. Noncitizen households, with odds of 1.370, are still statistically significantly more likely to be food insecure than U.S. mainland birth citizen households. Naturalized citizen and noncitizen with child citizen households, with respective odds of .820 and .876, are still statistically significantly less likely to be food insecure than U.S. mainland birth citizen households.

Model 3 adds receipt of other governmental assistance, which includes school lunch, school breakfast, and WIC. The results are statistically similar to Model 2. Noncitizen households, with odds of 1.390, are still statistically significantly more likely to be food insecure than U.S. mainland birth citizen households. Naturalized citizen and noncitizen with child citizen households, with respective odds of .830 and .802, are still statistically significantly less likely to be food insecure than U.S. mainland birth citizen households. The other household types do not statistically significantly differ from U.S. mainland birth citizen households.

Model 4 includes all previous variables and nongovernmental assistance, which includes use of a food bank or soup kitchen in the last 12 months and receiving food from meals on wheels or a community program in the last 30 days. Noncitizen households, with odd of 1.459, are still statistically significantly more likely to be food insecure than U.S. mainland birth citizen households. The likelihood of noncitizen household food insecurity increases from 1.217 in Model 1 to 1.459 in Model 4 when all the various forms of food assistance are taken into consideration. Naturalized citizen and noncitizen with child citizen households, with respective odds of .856 and .833, are statistically significantly less likely to be food insecure than U.S. mainland birth citizen households. Mixed citizen and noncitizen with adult citizen households do not statistically significantly differ from U.S. mainland birth citizen households. However, households containing a territorial birth citizen, with odds of 1.232, are statistically more likely to be food insecure than U.S. mainland birth citizen households. Although all household types

potentially benefit from these additional forms of assistance, U.S. territorial birth citizens appear not to benefit as much.

In Model 4, naturalized citizen households ($p < .05$) are significantly statistically less food insecure than U.S. mainland birth households; this does not support hypothesis H1 which hypothesized no difference. Mixed citizen households and noncitizen with adult citizen households are not significantly different statistically; this supports hypothesis H2 and H3. U.S. territorial birth households ($p < .05$) are significantly statistically more food insecure; this supports hypothesis H4. Noncitizen households ($p < .001$) are significantly statistically more food insecure; this supports hypothesis H5. Noncitizen with child citizen households ($p < .01$) are significantly statistically less likely to be food insecure. This does not support hypothesis H6, in fact it shows significant difference in the opposite direction than I hypothesized. Receipt of SNAP as shown in Model 2 does attenuate the difference in food insecurity for the mixed citizen, noncitizen with adult citizen, and U.S. territorial birth citizen households supporting hypothesis H7.

Discussion

There is considerable difference in food insecurity between households of the foreign born who have become naturalized citizens and those who are noncitizens. Naturalized citizen households are less likely to be food insecure than U.S. mainland birth citizen households. Naturalization is a sifting process. It requires legal immigrant status to begin with, followed by years of residency, a demonstrated knowledge of English, and the ability to afford the naturalization application fee. Naturalized citizens are apparently economically well established in the United States (Zong and Batalova 2016) and this is reflected in their food insecurity status.

Noncitizen households are more likely to be food insecure than U.S. mainland birth citizen households. When all the forms of food assistance are considered, noncitizen households are almost one and half times as likely to be food insecure as U.S. mainland birth citizen

households. This is not surprising. These households include ineligible foreign born, such as, unauthorized immigrants, temporary residents, newly arrived immigrants who may not yet be economically established and do not yet meet SNAP residency requirements, and some who are eligible for assistance who for some reason do not apply.

Two household types of mixed status, the mixed citizen combination of U.S. mainland birth citizen and naturalized citizen household and the combination of noncitizen and adult U.S. citizen household, do not differ statistically in food security from the U.S. mainland birth citizen household after receipt of SNAP is taken into consideration. This remains true when other forms of assistance are included.

The remaining household type of mixed status, the noncitizen with child citizen household, is statistically significantly less likely to be food insecure than the U.S. mainland birth citizen household. This was unexpected. These are households of noncitizen parents raising citizen children; these are the children of immigrants households which literature often indicates are more food insecure

(Anderson et al. 2014, Gundersen and Ziliak 2014, Kalil and Chen 2008, Rubio et al. 2019). Unlike in the literature, here all households of this type are taken into account, not just those of a certain income level or certain ethnic group. When this is done, and the possibility of the children receiving SNAP, school lunch, school breakfast, WIC, and other assistance is also considered, these households have statistically less likelihood of food insecurity when contrasted to U.S. mainland birth citizen households. However, I wish to emphasize that nationwide all households with children consistently show greater likelihood of food insecurity than the national average (Coleman-Jensen 2018).

U.S. territorial birth citizen households when compared to U.S. mainland birth citizen households are more likely to be food insecure in Model 4. SNAP and other governmental assistance decrease the likelihood of food insecurity as shown in Models 2 and 3, but when the additional nongovernmental forms of assistance are included, these households again are more food insecure. Restrictions on food assistance based on

citizenship status cannot explain why households with citizens born in the U.S. territories are more likely to be food insecure. These are citizens who, as such, are fully eligible for benefits. Not speaking English has been associated with food insecurity (Gany et al. 2014, Maxwell et al. 2015, Moos 2008); this is a characteristic that noncitizens and territorial born citizens often share. Literature on food insecurity of citizens born in the territories and now living in the U.S. mainland is sparse. Most territorial birth citizens are from Puerto Rico, which is the most populous U.S. territory. Possibly Puerto Ricans on the mainland are especially poor or live in areas of inadequate social service reach. Why territorial born citizens have higher rates of food insecurity is an area that needs further study.

These findings indicate a few ways food insecurity might be alleviated. First, make sure the eligible, this includes those born in the U.S. territories and eligible noncitizens, receive food assistance, if needed, by doing more outreach (Gorman et al. 2013). Outreach may especially be needed to households whose primary language is not English. Most of these households are Spanish speaking, but outreach in various Asian (Kim 2016, Kiptiness and Dharod 2011), African (Dharod et al. 2013), or indigenous American (Moos 2008) languages might be needed in certain areas. Second, provide food assistance to all residents in need, including noncitizens. This would require action by Congress, although the states have some capability of doing this. Recently arrived immigrant families with young children need food assistance more than immigrant families of longer residence, yet these are ineligible due to length of residency requirements (Capps et al. 2009).

In addition to household citizenship status, certain groups have greater food insecurity and more should be done to alleviate their insecurity. Groups with greater food insecurity include the poor, Hispanic and black households, households with children, households with a disabled person, and households currently receiving food assistance.

Adult food insecurity needs more examination. In about half the food insecure households with children, only the adults are food insecure (Coleman-Jensen et al. 2018). Apparently, these adults cut back on their own food so as to keep the children from food insecurity.

This is not beneficial for the health and well-being of these adults, nor, in the longer run, for the children for whom they care. Individuals living alone, whether men or women, also have higher than average food insecurity (Coleman-Jensen et al. 2018). Do the work requirement restrictions limiting SNAP benefits to adults increase adult food insecurity? Would more food assistance, housing assistance, or a higher minimum wage enable these food insecure adults to be healthier, more productive workers?

This study does not explain why those who receive SNAP still report food insecurity, but I offer some suggestions. There are indications that SNAP relieves food insecurity, but the transitions into and out of the program need to be improved (Coleman-Jensen et al. 2015, Li et al. 2014). An easier, more rapid transition to receiving SNAP as soon as need arises would help. Also, households may become food insecure when exiting the program because the cessation of SNAP benefits is too rapid, abrupt, or unexpected. Improving the administration of the program, including how long one can receive benefits, might help. The neediest households participate in SNAP and in other assistance programs, yet the total package is not enough (Anderson et al. 2014, Gray and Cunyningham 2016, Ratcliffe et al. 2011). A larger SNAP benefit would help these families, but they most likely need more housing or other assistance as well. A seasonal benefit increase during the summer would help families with children prevent food insecurity during the time the children are not participating in the school lunch program (Huang et al. 2016, Nalty et al. 2013).

Limitations

Although the CPS may be the best nationwide sample of food insecurity data, it is not designed to sample by household citizenship status. The proportion of foreign born in this sample, 10.23%, is smaller than the estimated 13.4% foreign born in the population during 2013-2017 (U.S. Census Bureau 2020). The CPS

oversamples states with smaller populations (U. S. Census Bureau 2019) resulting in under sampling of the foreign born, 46% of whom live in the large population states of California, New York, and Texas (Greico et al 2012). The average food insecurity rate from 2015-2017 for all Texas residents is higher than the national average, while the rates for residents of California and New York are lower (Coleman-Jensen et al. 2018). A sample that includes the foreign born in proportion to their residence in each state, and in the nation as a whole, could give us more reliable information about the effect of citizenship status on food insecurity. It is difficult to know if such a sample would yield different results, but it is reasonable to conclude that results would be very similar.

Conclusion

In conclusion, household citizenship status, as determined by all members of a household, is associated with variation in food insecurity even after controlling for food assistance received, householder(s) race, householder(s) education, marital status and sex, household income, and household size. Three types of households, U.S. mainland birth citizen, mixed U.S. mainland birth and naturalized citizen, and noncitizen with adult U.S. mainland birth citizen, do not differ statistically in food insecurity. Households of naturalized citizens and noncitizen with child U.S. mainland birth citizen are less likely to be food insecure than households of U.S. mainland birth citizens. Households of noncitizens and households containing a U.S. territorial birth citizen are more likely to be food insecure than households of U.S. mainland birth citizens. SNAP helps alleviate food insecurity. SNAP policies that exclude many noncitizens from food assistance may contribute to the food insecurity of noncitizen households but cannot explain the increased food insecurity risk of the U.S. territorial birth citizen households.

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