Research Article

Estimating the Number, Distribution, and Predictors of Food Pantries in the US

Michael P. Burke, PhD, MPH[1]; Emma Huffman, BA[2]

ABSTRACT

Objective: To estimate the number, distribution, and predictors of food pantries across counties in the US in 2020.

Design: A cross-sectional, secondary data analysis of geocoded food pantry locations and social, demographic, and economic characteristics at the county level.

Participants: Publicly disclosed food pantry locations were collected from websites in all counties. Pantry locations were merged with data from the American Community Survey 2015−2019.

Main Outcome Measures: The number of food pantries per county.

Analysis: A negative binomial regression estimated the association between the number of pantries per county and community characteristics.

Results: We found 48,581 food pantries from publicly disclosed websites, covering 98% of counties. The mean and median number of pantries per county were 15.5 and 6, respectively. Selected characteristics positively associated with the number of pantries per county were income inequality, percentage of noncitizens, and percentage of single-parent households. Selected characteristics negatively associated with the number of pantries per county were percent with a high school education or less, percent of households in poverty, and rurality.

Conclusions and Implications: The US has an extensive network of food pantries. Future work could assess the potential causal pathways between pantry placement and county-level characteristics.

Key Words: food pantry, food bank, emergency food assistance, nutrition assistance, food insecurity (*J Nutr Educ Behav.* 2023;55:182−190.)

Accepted December 13, 2022. Published online January 26, 2023.

INTRODUCTION

Emergency food assistance sites are a crucial component of the social safety net in the US and have played an important role during the coronavirus disease 2019 (COVID-19) pandemic. Composed primarily of food banks, food pantries, and emergency kitchens, these sites help ensure that households with limited income can obtain food when other resources, such as personal income and government assistance, are inadequate. Their modern history began in the late 1960s with the establishment of the first food bank and have since become a staple of nutrition assistance, with an impressive expansion and institutional formalization.[1] For example, Feeding America, the nation's largest food bank organization, has more than 200 food banks in its network, fundraised $582 million in 2020, and has a corporate structure.[2]

Food banks are central hubs that organize, procure, and distribute food to a network of food assistance sites. Of particular interest are food pantries, as they are the sites that populations with limited income are most likely to visit to obtain emergency food.[3] Food pantries are sites that distribute foods that are meant to be prepared and consumed offsite. This includes traditional food pantries, mobile pantries, pop-up pantries, food backpack programs, and food boxes. It also includes sites that might have been opened in response to the COVID-19 pandemic, such as drive-thru pantries in which the food is placed inside a vehicle without the client needing to exit the vehicle. In 2020, 6.7% of households with limited income reported using a food pantry in the last 12 months, whereas 0.4% visited an emergency kitchen.[3] Food pantries are diverse in size, organization type, and available services. For example, pantries may serve a dozen or a thousand people per month, be located within a place of worship or an independent sole-focus location, and offer only food or other support services such as energy bill assistance. Food pantries typically have certain eligibility criteria, such as income limits, the number of visits allowed per month, and geographic restrictions.

[1]Department of Sociology, Georgetown University, Washington, DC
[2]School of Nursing and Health Studies, Georgetown University, Washington, DC
Conflict of Interest Disclosure: The authors have not stated any conflicts of interest.
Address for correspondence: Michael P. Burke, PhD, MPH, Department of Sociology, Georgetown University, Car Barn, Ste 209, 3520 Prospect St NW, Washington, DC 20057; E-mail: mike.burke.phd@gmail.com

https://doi.org/10.1016/j.jneb.2022.12.001

Food pantries are a nongovernmental and place-based strategy to prevent and treat food insecurity, reduce food waste, and meet other emergency needs. In 2020, one-third of households with limited income were food insecure, with higher rates among households with children and Black and Hispanic households.[3] Food insecurity is associated with a wide range of negative health outcomes, including inadequate dietary intake and mental health disorders.[4,5] Unlike federal nutrition assistance programs such as the *Supplemental Nutrition Assistance Program* (SNAP), receiving food from pantries is less bureaucratic. Often a person can arrive at a pantry, complete a brief intake process, and receive food immediately. This is important because households may rely on food pantries when other resources are depleted, such as a monthly SNAP benefit,[6] and there are few alternatives.[7] In addition, food pantries are receptive to a wider range of households with limited incomes, such as those with noncitizen members, able-bodied adults without dependents (ABAWDs), and those with countable assets of more than $2,500. That is not to say the federal government has no role in the food bank system—food banks receive a considerable amount of food from The *Emergency Food Assistance Program* and the *Commodity Supplemental Food Program* and distribute it throughout their network of pantries.

There is no central source of food pantry locations in the US, and little is currently known about their total number, distribution, and predictors. In a study conducted in 2000, Ohls and colleagues[8] estimated there were 32,700 food pantries across the nation; however, this was based on a survey sample that used statistical weights to generate a representative estimate. In 2012, Weinfield and colleagues[9] estimated that Feeding America's network of food banks had 38,227 pantries (excluding home-delivered grocery programs), again using a survey sample with statistical weights and excluding any program outside the Feeding America network. Heflin and Price[10] estimated there were 2,300 pantries in 2012 but only counted pantries with annual revenue of more than $30,000 and are therefore required to file tax returns. To our knowledge, no study has considered the geographic distribution of pantries across counties or their predictors in the US, information that would provide insight into the types of communities that pantries are most and least likely to serve.

Food pantries play a critical role in the nation's social safety net and have come under unprecedented strain during the COVID-19 pandemic.[11] This study aimed to estimate the number, distribution, and predictors of food pantries in the US by county in 2020.

METHODS

Data Source and Population

Publicly disclosed food pantry locations were collected from 2 primary websites and supplemented with a county-by-county internet search. The internet is an ideal medium for data collection because food banks, pantries, and other social service agencies commonly make pantry services and locations known to the public via websites. We used Feeding America as our first website,[12] which is by far the nation's largest food bank organization, with coverage in every state and DC. We visited each Feeding America food bank website and affiliated partner distribution organization website and collected the street address of each food pantry listed. We used foodpantries.org as our second website. Foodpantries.org is a crowdsourced website that provides food pantry locations within selected cities in all 50 states and DC.[13] Within each state and city, we collected the street address of each food pantry listed. Because foodpantries.org is crowdsourced and could be susceptible to outdated or inaccurate entries, we verified a 10% random sample of pantries from foodpantries.org and found that 98% could be verified via an online search. Foodpantries.org was chosen because of its breadth of geographical coverage and our assumption that its crowdsourced nature would be more likely to include smaller pantries and/or pantries not part of existing emergency food networks. Using the Google internet search engine (Alphabet Inc), we searched for food pantries within each county to supplement the 2 websites. For example, we searched "food pantries [county state][city county state]" and collected the street address of each food pantry listed from resulting websites until those websites no longer produced unique locations. The resulting websites included individual webpages such as those from social media accounts and standalone pantry websites, but also included other websites that consolidate and share pantry location information (eg, county websites and nonprofit organizations). Across all websites, we used our best judgment to ensure the pantry information was legitimate and not outdated. This study used publicly available, nonprivate, secondary data and was therefore exempt from Institutional Review Board approval per the Office of Management and Budget of the US Government under federal regulation 45 46.101 (b) CFR.

The food pantry data were collected from March to December 2020 during the beginning of the COVID-19 pandemic. Generally, each website was visited once and was not revisited to check for updates throughout the year. Many websites listed their pre-COVID-19 pantry locations with a request that users call to confirm availability; some updated their website with openings and closures; others made no mention of changes in availability. Although we did not systematically collect information on how websites handled changes in availability, we assessed that the vast majority did not update their location lists but instead asked users to confirm availability. This is sensible given the effort it takes to continuously update listings, especially during rapidly changing health, social, and economic conditions.

Only food pantry locations that were operational and in which non-prepared food was given and meant to be consumed offsite were collected. This included traditional food pantries, mobile pantries, pop-up pantries, food backpack programs, food boxes, and drive-thru pantries.

Pantries that were open to the public or only open to specific populations such as seniors, students, or residents of apartment complexes were also included. Location information on grocery delivery programs or meal sites such as emergency kitchens, soup kitchens, or community kitchens was not collected, nor was location information on places served by food banks such as shelters and rehabilitation centers. Most websites clearly distinguished between pantries and meal sites, whereas other websites had ambiguous distinctions. These cases were handled in 2 ways: locations were not included if (1) it had a name that indicated it was a meal site (eg, church soup kitchen), or (2) there was other information that suggested it was a meal site such as meal pickup only.

The outcome variable of interest was the number of pantries per county, which we conceptualized as a measure of access. We assumed that more pantries generally meant better access for most county residents. Pantries per county were ideal because data on the number of pantries per county were readily accessible online, verifiable, and generally accurate. An alternative or complementary outcome could have been pounds of food distributed or people served per county, which we conceptualized as measures of capacity and reach. The issue with these outcomes was that many pantries did not publish (or perhaps even collect) pounds of food provided or people served, which would have resulted in missing data for a considerable subset of pantries. Given the limitations on pantry data related to capacity or reach, pantries per county were the only outcome considered for this study.

Covariates

County-level demographic, social, and economic characteristics were collected from the 2015–2019 American Community Survey (ACS).[14] The ACS 5-year estimates represent average values over the timeframe and include estimates for all counties (or county-equivalents). Variables in the model included the percentage of: households with a member who is disabled; population with a high school diploma or general equivalency degree or less; households participating in SNAP; households living below 100% of the federal poverty level; households with an older adult (aged ≥ 65 years); population that moved into the county in the previous year; population without health insurance; population that is noncitizens; population that is Black, White, or Hispanic (of any race); renter-occupied housing units; single-parent households; population that is unemployed; and population that is unmarried. Income inequality, total land area in square miles, median household income ($1,000 increments), and total population (10,000 increments) were also included. Income inequality was assessed using the Gini coefficient, which summarizes the income distribution across all households in a population (in our case, households within counties).[15] It ranges from 0 to 100, with a score of 0 representing a county in which household income is equally distributed across households and 100 representing a county in which a single household receives all the income. Metropolitan status came from the US Department of Agriculture's (USDA) Economic Research Service's Rural-Urban Continuum Codes (RUCC), 2013, the latest available year.[16] The codes range from 1–9, with lower scores indicating highly populated metropolitan counties and lower scores indicating less populated and isolated nonmetropolitan counties. Total land area estimates by county were collected from the US Census Bureau. Characteristics were chosen before data collection and analysis based on common use and relevance with research on populations that are low-income, food insecure, and use nutrition assistance.

Geocodes

We first reviewed the list of pantries to remove duplicates and correct grammatical issues. We then obtained the latitude and longitude of each pantry address using the online geocod.io service (Dotsquare LLC). We merged the Feeding America and foodpantries.org list of pantries and then merged that list with the internet search results. At each step in the merge process, the results were reviewed to remove duplicate entries and manually match near duplicates (ie, entries that should have matched but did not because of small grammatical or address differences). Pantries were grouped by county, and the total number was counted within each. Finally, the list of pantries per county was merged with ACS county-level data.

Data Analysis

Descriptive statistics were used to calculate the mean and median number of pantries per county and state. Across all counties, the mean ± SE and observed range of all variables used in the analysis are reported. Household income is reported in median dollars ± SE. A negative binomial regression with state-level fixed effects and clustered SEs to account for similarities of counties within states was used to estimate the association between pantries per county and county-level characteristics. Count regression models will sometimes use a population offset, which allows for the modeling of rates instead of counts (eg, the number of pantries per 10,000 residents vs the count of pantries).[17] For a population offset to be useful, one must assume that a doubling in the population results in a doubling of the outcome. This was not the case for our analysis; a doubling of county population did not consistently lead to a doubling of pantries (analysis not shown). In addition, when the population is a covariate of interest, as is the case with our analysis, one should not use it as an offset but instead as a covariate. Because the covariates captured overlapping aspects of socioeconomic status, the variance inflation factor was calculated to check for multicollinearity between covariates in the model. The regression results are presented as incidence rate ratios with 95% confidence intervals and P values with a significance level of 0.05. All analyses were conducted using R (version 4.2.2, R Foundation for Statistical Computing, 2022) and managed using RStudio (version 2022.07.2, RStudio Team, 2022).

RESULTS

There were 48,581 food pantries across 3,142 counties or county-equivalents (the total number in ACS and the US). Feeding America had 28,342 pantries; foodpantries.org had 14,152 pantries, and the manual internet search had 35,324 pantries. We first merged the Feeding America and foodpantries.org lists, which resulted in 36,946 unique pantries. Thirty-nine percent of pantries in the foodpantries.org list matched with the Feeding America list. Next, we merged the Feeding America/foodpantries.org list with the internet search list, which resulted in 48,581 total unique pantries. Sixty-seven percent of pantries in the internet search list matched with the Feeding America/foodpantries.org list. Match statistics are not exact because of rounding and manual near-duplicate removal after the merges. The number of pantries—which Feeding America terms grocery programs but are in practice equivalent to pantries—in the Feeding America list is less than their previous estimate of 38,227 in 2012; however, not all Feeding America websites made pantry location information available. Instead, some had website visitors call the food bank to get a location or referred them to a third-party website that only allowed pantry location information for potential clients. However, we expected that some pantries found through foodpantries.org and the internet search included Feeding America pantries, although they were not necessarily marked as such.

The mean ± standard error and median (range) pantries per county were 15.5 ± 0.6 and 6.0 (0–631), respectively, with considerable state-level variation (Table 1). A map shows the distribution of pantries by county (Figure). Median household income was $51,758; 13% of households lived in poverty; 39% of residents had a high school diploma or general equivalency degree or less; 34% of households had a single parent; 3% of individuals were unemployed; and 72%, 18%, and 13% identified as White alone, Hispanic of any race, or Black alone, respectively (Table 2).

Results of the negative binomial regression show several characteristics were negatively and positively associated with the number of pantries per county (Table 3), and a selection is described here. A 1 percentage-point increase in households living in poverty was associated with 3% fewer pantries ($P < 0.001$). A 1 percentage-point increase in households with an older adult was associated with 2% fewer pantries ($P < 0.01$). A $1,000 increase in the median household income was associated with 1% fewer pantries ($P < 0.001$). A 1 percentage-point increase in individuals who moved into the county last year was associated with 6% fewer pantries ($P < 0.001$). A 1-U increase in RUCC code was associated with 14% fewer pantries ($P < 0.001$).

A 1-U increase in income inequality was associated with 2% more pantries ($P < 0.001$). A 1 percentage-point increase in noncitizen individuals was associated with 2% more pantries ($P < 0.05$). A 10,000-person increase in the number of people per county was associated with 1% more pantries ($P < 0.001$). A 1 percentage-point increase in single-parent households was associated with 1% more pantries ($P < 0.001$). The variance inflation factor was less than 3 for all variables, suggesting multicollinearity is not a strong concern in the model.

DISCUSSION

Food pantries are an integral part of the emergency food assistance system, yet few studies have estimated their number, distribution, and predictors across the country. We found more than 48,500 pantries across the US from publicly disclosed websites, with a mean and median number of pantries per county of 15.5 and 6.0, respectively. The difference in the mean and median number of pantries per county reflects the positive skew of the pantry-per-county distribution. The number of pantries per county was associated with county-level social, demographic, and economic characteristics such as income inequality, citizenship status, single-parent households, poverty, and rurality.

The US has 15 federal nutrition assistance programs available to populations with limited income. In the fiscal year 2020, USDA spent $94 billion on the largest 3 programs (SNAP, *National School Lunch Program*, and *Special Supplemental Nutrition Program for Women, Infants, and Children*) that served 68 million participants. However, despite this considerable spending and participation, many people rely on food assistance from food pantries. This reliance may be in addition to federal nutrition assistance or on its own. Regarding the former, food pantries see increases in usage toward the end of the SNAP monthly benefit cycle,[6] suggesting participants rely on pantries when monthly federal nutrition assistance program benefits are exhausted. Toward the latter, participants may not use federal nutrition assistance because of government welfare stigma, feeling that benefits are not worth the effort of applying, eligibility concerns, or personal independence from government programs.[18–20] In addition to personal choices and perceptions of nutrition assistance, there have also been considerable structural changes that facilitated the rise and spread of food pantries. Beginning in President Reagan's administration, government assistance to populations with limited income was eroded, and it is argued that this erosion facilitated the rise of food banks and pantries as they filled the gap left by less generous benefits and more restrictions on who could participate.[21,22] To our knowledge, our estimate of the number of pantries in the US is the highest ever reported, which is important for understanding access across states and counties. Our food pantry data are unique in that they were collected during the COVID-19 pandemic, which saw increased unemployment and demand for food pantries[23]; however, it is unclear how this affected the number of food pantries available. Furthermore, in response to the pandemic, the USDA's Food and Nutrition Service implemented several policies to reduce food insecurity, such as increased SNAP benefits and access to *Pandemic Electronic Benefit Transfer* program, which could have blunted demand for pantries.[24]

Pantries are often staffed by volunteers, and many receive food

Table 1. Descriptive Information on the Estimated Number of Food Pantries by State and County (or County Equivalent) in the US in 2020 (n = 48,581)

State	Total Pantries	No. of Pantries Per County, Mean ± SE	Median No. of Pantries Per County
AK	120	4.1 ± 1.7	1.0
AL	1,215	18.1 ± 3.0	10.0
AR	1,226	16.3 ± 2.8	10.0
AZ	576	38.4 ± 14.2	14.0
CA	3,741	64.5 ± 14.1	22.5
CO	663	10.4 ± 2.1	4.0
CT	619	77.4 ± 22.9	45.5
DC	101	101.0	101.0
DE	133	44.3 ± 24	25.0
FL	2,412	36 ± 5.3	18.0
GA	2,206	13.9 ± 1.7	7.0
HI	263	52.6 ± 25.6	29.0
IA	733	7.4 ± 1.0	5.0
ID	325	7.4 ± 1.5	4.0
IL	1,981	19.4 ± 5	6.5
IN	1,398	15.2 ± 2.4	8.0
KS	437	4.2 ± 0.5	3.0
KY	674	5.6 ± 0.9	4.0
LA	684	10.7 ± 1.8	4.5
MA	876	62.6 ± 11.8	52.5
MD	803	33.5 ± 8.7	18.0
ME	540	33.8 ± 5.1	25.0
MI	2,213	26.7 ± 5.6	13.0
MN	880	10.1 ± 1.8	6.0
MO	1,070	9.3 ± 1.9	4.0
MS	497	6.1 ± 1.0	4.0
MT	257	4.6 ± 0.7	3.0
NC	1,832	18.3 ± 2.2	12.0
ND	255	4.8 ± 0.7	3.0
NE	270	2.9 ± 0.9	1.0
NH	380	38 ± 7.5	30.5
NJ	1,246	59.3 ± 8.4	64.0
NM	585	17.7 ± 4.7	11.0
NV	250	14.7 ± 9.3	3.0
NY	2,976	48 ± 9.7	18.0
OH	1,936	22 ± 4.1	10.0
OK	718	9.3 ± 1.9	6.0
OR	726	20.2 ± 4.1	12.5
PA	2,043	30.5 ± 8.3	15.0
RI	182	36.4 ± 25.2	13.0
SC	910	19.8 ± 3.2	12.0
SD	192	2.9 ± 0.4	2.0
TN	781	8.2 ± 1.5	4.0
TX	2,428	9.6 ± 1.5	3.0
UT	188	6.5 ± 2.0	4.0
VA	1,296	9.7 ± 1.0	6.0
VT	277	19.8 ± 2.9	20.5
WA	762	19.5 ± 4.2	12.0
WI	1,024	14.2 ± 2.3	9.0
WV	555	10.1 ± 1.2	7.0
WY	126	5.5 ± 1.2	4.0
Total	48,581	15.5 ± 0.6	6.0

donations from the communities they serve.[9,25] We found a negative association between rates of poverty, having a high school education or general equivalency degree or less, and the number of pantries per county, suggesting that these counties may lack the resources to establish and operate food pantries as poverty and low educational attainment are associated with lower rates of charitable giving and volunteering.[26,27] We also found a negative association between median household income, county population inflow, and pantries per county, suggesting that counties with higher incomes and the ability to draw people into the county may have less need for pantries. This is in line with other research showing that higher income predicts less food pantry usage, even among households with limited income.[28] Our model showed that county population inflow was a particularly strong predictor, and we hypothesize this could be for 2 primary reasons. First, those who move may do so for employment,[29] making inward mobility a proxy for favorable socioeconomic conditions not captured by other variables. Second, those new to communities are less likely to volunteer,[30] therefore, making it harder for food pantries to find staff. Finally, we found a negative association between the percentage of households with an older adult and rurality and pantries per county. Although older adults volunteer more hours than younger age groups,[31] they are also more wealthy,[32] which would reduce the need for pantry usage. It is possible that although there are more volunteer hours from which to draw, there is less demand. Finally, we found that more rural counties have fewer pantries, and this likely reflects difficulties serving rural populations because of a mix of geographic isolation, lack of social service networks, and general lack of resources compared with more urban counties.[33]

A central appeal of the food bank system is to simultaneously reduce food insecurity and waste by rescuing food that would otherwise be thrown away. This is commonly achieved by

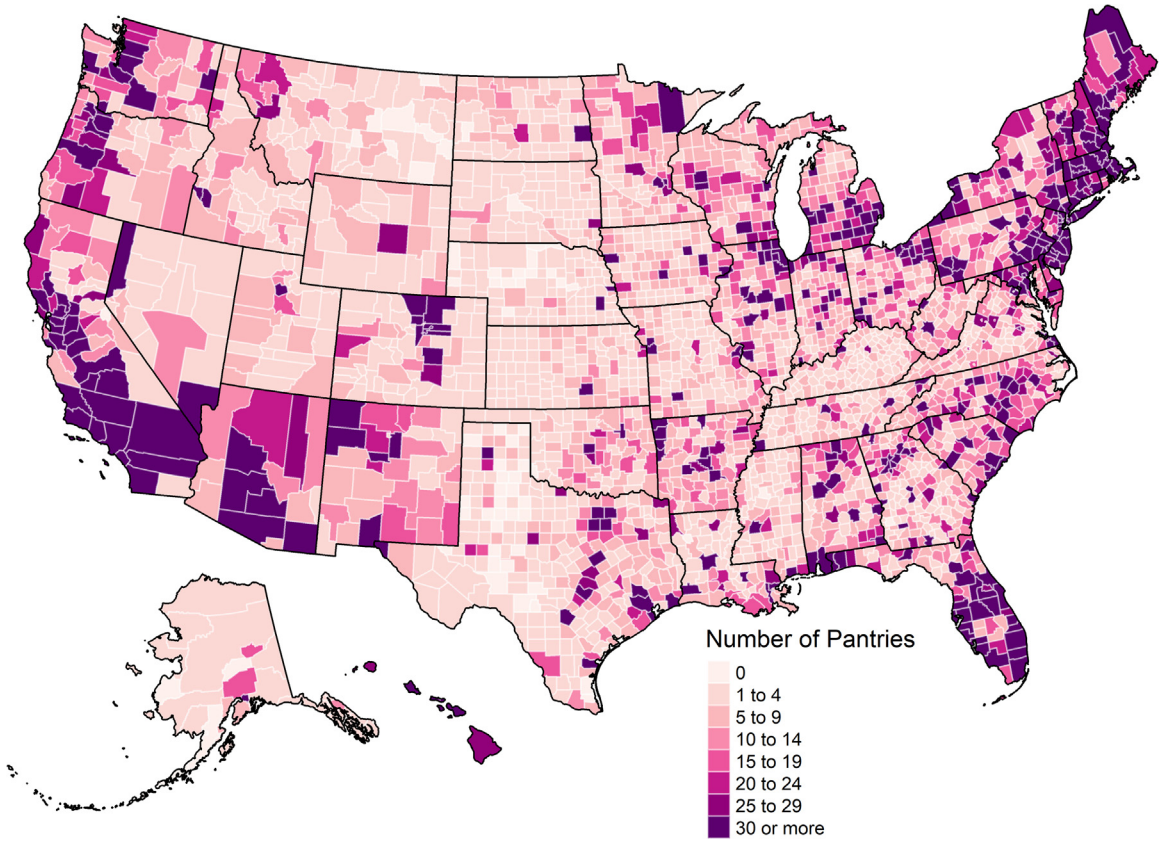

Figure. Estimated number of food pantries by county (or county equivalent) in the US in 2020.

Table 2. Descriptive Information on the Estimated Number of Food Pantries and Selected Characteristics in US Counties (or County Equivalent), 2015–2019 (n = 3,142)[a,b]

Characteristic	Mean ± SE	Range[c]
No. of food pantries	15.5 ± 0.6	0–631
Disability (%)	15.1 ± 0.6	5.2–43.2
High school diploma/general equivalency degree or less (%)	39.0 ± 0.9	8.4–93.7
Household income inequality (Gini coefficient)	44.5 ± 0	30.2–70.7
Household SNAP participation (%)	11.7 ± 0.6	0–59.2
Households in poverty (%)	12.9 ± 0.6	0–48.2
Households with older adult (aged ≥ 65 years) (%)	29.4 ± 0.8	10.3–77.2
Land area (square miles)	1,209 ± 68	2–147,843
Median household income[d]	51,758 ± 317	21,504–142,299
Moved into the county in the past year (%)	6.2 ± 0.4	0–41.1
No health insurance (%)	12.4 ± 0.6	0–58.6
Noncitizen (%)	6.8 ± 0.4	0–32.9
Black alone (%)	12.7 ± 0.6	0–87.2
Hispanic (%)	18.0 ± 0.7	0–99.2
White alone (%)	72.5 ± 0.8	3.6–100
Renter-occupied housing units (%)	36 ± 0.9	6.9–100
RUCC	5 ± 0	1–9
Single-parent households (%)	33.8 ± 0.8	0–84
Total population	103,341 ± 5,908	66,100–81,570
Unemployed (%)	3.4 ± 0.3	0–15.6
Unmarried (%)	50 ± 0.9	17.5–79.7

RUCC indicates Rural-Urban Commuting Code; SNAP, *Supplemental Nutrition Assistance Program.*
[a]No. of pantries per county collected in 2020; county characteristics collected in 2015–2019; [b]Percentage of the county population; [c]Observed range in the sample; [d]Median ± SE.

Table 3. Association Between Number of Pantries Per County (or County Equivalent) and Selected Characteristics in the US, 2015–2020 (n = 3,142)[a,b]

Characteristics	IRR[c]	95% Confidence Interval	*P*
Disability (%)	1.01	1.00–1.02	0.11
High school diploma/general equivalency degree or less (%)	0.97	0.97–0.98	< 0.001
Household income inequality (Gini coefficient)	1.02	1.01–1.03	< 0.001
Household SNAP participation (%)	1.01	0.99–1.02	0.28
Households in poverty (%)	0.97	0.96–0.98	< 0.001
Households with older adult (aged ≥ 65 years) (%)	0.98	0.97–1.00	< 0.01
Land area (square miles)	1.00	1.00–1.00	0.60
Median household income (per $1,000)	0.99	0.98–0.99	< 0.001
Moved into the county in the past year (%)	0.94	0.93–0.95	< 0.001
No health insurance (%)	1.00	0.99–1.01	0.85
Noncitizen (%)	1.02	1.00–1.04	<0.05
Black, non-Hispanic (%)	1.00	0.99–1.01	0.96
Hispanic (%)	1.00	0.99–1.00	0.29
White, non-Hispanic (%)	1.00	1.00–1.01	0.18
Renter-occupied housing units (%)	1.01	1.01–1.02	< 0.01
RUCC	0.86	0.83–0.88	< 0.001
Single-parent households (%)	1.01	1.00–1.01	< 0.01
Total population	1.01	1.01–1.01	< 0.001
Unemployed (%)	1.02	0.99–1.05	0.25
Unmarried (%)	1.02	1.01–1.03	< 0.001

IRR indicates incidence rate ratio; RUCC, Rural-Urban Commuting Code; SNAP, *Supplemental Nutrition Assistance Program.*
[a]No. of pantries per county collected in 2020; county characteristics collected in 2015–2019; [b]Percentage of the county population.
Note: $P < 0.05$ were considered statistically significant.

organizations and individuals with a surplus of food donating it to food banks and pantries for distribution, which requires considerable infrastructure, logistics, and experience.[34] We found that counties with higher income inequality had more pantries, suggesting that those counites may have both the means for supporting pantries (ie, a concentration of households with high income) and demand for pantries themselves (ie, a large share of households with limited incomes). We found a positive association between the percentage of those who rent their home and the number of pantries per county. Renters tend to have less wealth and are more transient than homeowners,[35,36] suggesting they may increase demand for food pantries in the communities in which they live as they have fewer financial resources and less social capital in times of need.[37] We found that the percentage of people who are unmarried or who are noncitizens was positively associated with the number of pantries per county. Both of these groups are less likely to be eligible for federal nutrition assistance because of participation restrictions; for example, ABAWDs have participation time limits and are more likely to be unmarried compared with low-income non-ABAWDs[38] and noncitizens are ineligible for SNAP in most circumstances, which suggests these population groups might increase demand for pantries. We found that the percentage of single-parent households (a group that typically is eligible for most nutrition and other federal assistance programs) in a county is positively associated with the number of pantries. Food insecurity is a high-profile issue in the US,[39] and this may facilitate a greater number of pantries in counties with more children from single-parent homes in need, which are salient population groups. Finally, we found that the total county population is positively associated with the number of pantries per county, possibly because of more concentrated demand and efficient service delivery.

This study has several limitations. We only captured pantries publicly disclosed online, in English, to Feeding America affiliated food banks and partnered distribution organizations, to foodpantries.org, or could be found using our keyword search in the Google search engine in 2020. Our search protocol likely underestimated the true number of pantries in the US for 2 primary reasons: (1) some pantries likely had little or no online presence and, therefore, would not be captured by our search; and (2) some pantries listed as a single site may operate several subsites not listed online. Second, we used pantries per county as our measure of access, which assumes that more pantries mean better access. However, more pantries do not necessarily translate into better access for all county residents. For example, if pantries are clustered in population centers, more pantries may not mean better access for households outside the population center. Third, we relied on the accuracy of website descriptions of food pantries when classifying an entry as a pantry, emergency food kitchen, or other types of food assistance. Some of these descriptions may have been inaccurate. Fourth, food pantries often exclusively serve those in the local community, making county-level characteristics a relevant predictor.

However, some pantries cover larger or adjacent geographic areas, which would make single county-level characteristics less relevant. Finally, although our study provides important evidence, it was cross-sectional and cannot determine conclusively why certain counties have more pantries than others.

IMPLICATIONS FOR RESEARCH AND PRACTICE

There are several areas of future research that are worthwhile based on our results. First, assuming relevant data are available, other characteristics of pantries in a county could be used to understand access, capacity, and reach, such as mean distance to the nearest pantry; operational hours; pounds of food distributed, people served; and connections to and attributes of a parent food bank, which could complement our results. Second, expanding the internet search of pantries to include websites and search terms published in languages other than English would be more inclusive and could result in more pantries being collected. Third, examining how online pantry availability is associated with real-world availability would help address possible measurement errors and validate information found online. Fourth, considering smaller geographic areas such as census tracts or blocks would provide a more granular examination of pantries and their associated community characteristics. Fifth, examining the different types of pantries (eg, traditional, mobile, pop-up, and drive-thru) and their relative contribution to the overall number of pantries would be helpful for a deeper understanding of the pantry landscape. Finally, additional work—especially qualitative—could explore why organizations open pantries in certain communities and not others, which would help interpret our results. For example, we found it surprising and possibly concerning that higher poverty rates were associated with fewer pantries, adjusting for other community characteristics. Explaining why poorer counties, presumably with more need, have fewer pantries is an important area of future research. Food pantries will continue to be a prominent feature of the nutrition assistance landscape in the US, and understanding their number, distribution, and predictors are important to effectively strengthen nutrition security and provide services to those in need.

REFERENCES

1. Poppendieck J. *Sweet Charity?: Emergency Food and the End of Entitlement*. Penguin Group; 1999.
2. Feeding America. *Feeding America Annual Report 2020*. Feeding America; 2020. https://www.feedingamerica.org/sites/default/files/2021-03/FA_2020AnnReport_FINAL_updated0309_v2.pdf. Accessed October 26, 2021.
3. Coleman-Jensen A, Rabbitt MP, Gregory C, Singh A. *Statistical Supplement to Household Food Security in the United States in 2020*. US Department of Agriculture, Economic Research Service; 2021.
4. Burke MP, Martini LH, Çayır E, Hartline-Grafton HL, Meade RL. Severity of household food insecurity is positively associated with mental disorders among children and adolescents in the United States. *J Nutr*. 2016;146:2019–2026.
5. Hanson KL, Connor LM. Food insecurity and dietary quality in US adults and children: a systematic review. *Am J Clin Nutr*. 2014;100:684–692.
6. Byrne AT, Just DR. The other half: an examination of monthly food pantry cycles in the context of SNAP benefits. *Appl Econ Perspect Policy*. 2021;43:716–731.
7. Bazerghi C, McKay FH, Dunn M. The role of food banks in addressing food insecurity: a systematic review. *J Community Health*. 2016;41:732–740.
8. Ohls J, Saleem-Ismail F, Cohen R, Cox B. *The Emergency Food Assistance System-Findings From the Provider Survey, Volume II [Final Report]*. US Department of Agriculture, Economic Research Service; 2002.
9. Weinfield NS, Mills G, Borger C, et al. *Hunger in America 2014: National Report*. Feeding America; 2014.
10. Heflin C, Price A. Food pantry assistance and the great recession. *J Hunger Environ Nutr*. 2019;14:225–239.
11. Larison L, Byker Shanks C, Webber E, Routh B, Ahmed S. The influence of the COVID-19 pandemic on the food supply in the emergency food system: a case study at 2 food pantries. *Curr Dev Nutr*. 2021;5:nzab115.
12. Feeding America. Find your local food bank. https://www.feedingamerica.org/find-your-local-foodbank. Accessed October 26, 2021.
13. Foodpantries.org. Find food pantries. https://www.foodpantries.org/. Accessed October 26, 2021.
14. US Census Bureau. American Community Survey 2015–2019: 5-year public use data release. https://www.census.gov/newsroom/press-kits/2020/acs-5-year.html. Accessed December 15, 2021.
15. Gastwirth JL. The estimation of the Lorenz curve and Gini index. *Rev Econ Stat*. 1972;54:306–316.
16. US Department of Agriculture's Economic Research Service. Rural-Urban continuum codes. https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx. Accessed October 26, 2021.
17. Hilbe JM. *Negative Binomial Rregression*. 2nd ed. Cambridge University Press; 2011.
18. Andrade C. The economics of welfare participation and welfare stigma: a review. *Public Financ Manag*. 2002;2:294–334.
19. Bartlett S, Burstein B. *Food Stamp Program Access Study: Eligible Nonparticipants*. US Department of Agriculture, Food and Nutrition Service; 2004.
20. Moffitt RA. The deserving poor, the family, and the U.S. welfare system. *Demography*. 2015;52:729–749.
21. Stoesz D, Karger HJ. Deconstructing welfare: the Reagan legacy and the welfare state. *Soc Work*. 1993;38:619–628.
22. Bleich SN, Fleischhacker S. Hunger or deportation: implications of the Trump administration's proposed public charge rule. *J Nutr Educ Behav*. 2019;51:505–509.
23. Zack RM, Weil R, Babbin M, et al. An overburdened charitable food system: making the case for increased government support during the COVID-19 crisis. *Am J Public Health*. 2021;111:804–807.
24. US Department of Agriculture. American rescue plan. https://www.usda.gov/arp. Accessed February 12, 2022.
25. Tarasuk V, Dachner N, Hamelin AM, et al. A survey of food bank operations in five Canadian cities. *BMC Public Health*. 2014;14:1234.
26. Wiepking P, Bekkers R. Who gives? A literature review of predictors of charitable giving. Part two: gender, family composition and income. *Volunt Sect Rev*. 2012;3:217–245.

27. Choi NG, DiNitto DM. Predictors of time volunteering, religious giving, and secular giving: implications for nonprofit organizations. *J Sociol Soc Welf*. 2012;39:93–120.
28. Bhattarai GR, Duffy PA, Raymond J. Use of food pantries and food stamps in low-income households in the United States. *J Consum Aff*. 2005;39:276–298.
29. Warner C, Sharp G. The short- and long-term effects of life events on residential mobility. *Adv Life Course Res*. 2016;27:1–15.
30. Ghimire R, Skinner J. Atlanta Regional Commission. The relationship between length of community tenure and residents' volunteering at community events: results from the Metro Atlanta Speaks Survey. *J Rural Soc Sci*. 2019;34:3.
31. Turner JA, Klein BW, Sorrentino C. *Making Volunteer Work Visible: Supplementary Measures of Work in Labor Force Statistics*. US Department of Labor, Bureau of Labor Statistics; 2020.
32. Bhutta N, Bricker J, Chang AC, et al. Changes in U.S. Family finances from 2016 to 2019: evidence from the survey of consumer finances. *Fed Reserve Bull*. 2020;106:1–42.
33. Lewis ML, Scott DL, Calfee C. Rural social service disparities and creative social work solutions for rural families across the life span. *J Fam Soc Work*. 2013;16:101–115.
34. Lohnes JD. Regulating surplus: charity and the legal geographies of food waste enclosure. *Agric Human Values*. 2021;38:351–363.
35. Di ZX, Belsky E, Liu X. Do homeowners achieve more household wealth in the long run? *J Hous Econ*. 2007;16:274–290.
36. US Census Bureau. Geographic mobility: 2019 to 2020. https://www.census.gov/data/tables/2020/demo/geographic-mobility/cps-2020.html. Accessed October 3, 2021.
37. Magdol L, Bessel DR. Social capital, social currency, and portable assets: the impact of residential mobility on exchanges of social support. *Pers Relat*. 2003;10:149–170.
38. Lim Y, Mitchell KS. Characteristics of low-income able-bodied adults without dependents: implications for public policy. *J Policy Pract*. 2016;16:99–111.
39. Gundersen C. Food insecurity is an ongoing national concern. *Adv Nutr*. 2013;4:36–41.

ORCID

Michael P. Burke: http://orcid.org/0000-0002-6704-2294