



HHS Public Access

Author manuscript

Rural Sociol. Author manuscript; available in PMC 2024 December 01.

Published in final edited form as:

Rural Sociol. 2023 December ; 88(4): 972–1000. doi:10.1111/ruso.12507.

Informal modes of social support among residents of the rural American West during the COVID-19 pandemic

Kathryn McConnell*,

Brown University, Population Studies and Training Center

J. Tom Mueller,

University of Kansas Medical Center, Department of Population Health

Alexis A. Merdjanoff,

New York University, School of Global Public Health

Paul Berne Burow,

Stanford University, Department of Earth System Science, Doerr School of Sustainability

Justin Farrell

Yale University School of the Environment

Abstract

During the first year of the COVID-19 pandemic, federal spending to government safety net programs in the U.S. increased dramatically. Despite this unparalleled spending, government safety nets were widely critiqued for failing to fully meet many households' needs. Disaster research suggests that *informal* modes of social support often emerge during times of disruption, such as the first year of the pandemic. However, use of formal government programs and informal support are rarely examined relative to each other, resulting in an incomplete picture of how households navigate disaster impacts and financial shocks. This study compares estimates of informal social support to formal government program use in the rural U.S. West, drawing on data from a rapid-response survey fielded during the summer of 2020 and the 2021 Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC). We find that informal social support systems were, on aggregate, used almost as extensively as long-standing government programs. Our findings highlight the critical role of person-to-person assistance, such as sharing financial resources, among rural households during a disruptive disaster period. Routine and standardized data collection on these informal support behaviors could improve future disaster research and policy responses, especially among rural populations.

Keywords

Disaster and Technological Accidents; Policy Planning and Social Policy; Social Capital

*Corresponding author, Brown University Population Studies and Training Center, 68 Waterman St, Providence, RI 02912, kathryn_mcconnell@brown.edu.

Introduction

In March of 2020, the United States federal government administered more than \$600 billion in direct payments to households nationwide in an effort to address the impacts of the COVID-19 pandemic (M. Bitler, Hoynes, and Schanzenbach 2020a). The Families First Coronavirus Act and the Coronavirus Aid, Relief, and Economic Security (CARES) Act expanded existing government safety net infrastructure, created new programs, and gave funds directly to states and cities. These early investments have been attributed with staving off sharp increases in poverty during the initial period of the pandemic (Han, Meyer, and Sullivan 2020), but also have been critiqued for failing to fully meet widespread need (M. Bitler et al. 2020a; Moffitt and Ziliak 2020; Ohri-Vachaspati, Acciai, and DeWeese 2021).

As important as these *formal* government safety nets have proven to be, research on disasters has long documented the prevalence of *informal* modes of social support that emerge during times of hardship. Practices such as sharing financial assistance within social networks, moving into a friend or family member's home, or seeking resources through non-governmental organizations are all documented strategies for coping with financial stress (Aldrich 2012; Bolin and Stanford 1998; Pilkauskas, Garfinkel, and McLanahan 2014). Given the limitations of formal government program coverage during the early stage of the pandemic, it is likely that residents were relying on these informal strategies in addition to or instead of government programs. However, both in the context of the pandemic and in disaster research more broadly, formal and informal support use are rarely examined relative to each other, resulting in an incomplete picture of how households navigate disaster impacts and financial shocks.

We use novel data to compare the use of informal modes of social support to formal government program use in the context of the rural western U.S. We primarily draw on a rapid-response survey - the Rural U.S. West COVID-19 Survey - conducted among 1,009 residents between June 25 and July 22, 2020, a period which corresponds with one of the first major waves of the pandemic in the region. We complement results from this survey with estimates taken from the 2021 Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC), which corresponds to the 2020 calendar year.

While formal and informal support are used by residents across geographies, this study investigates a rural sampling frame because such regions generally have heightened susceptibility to disasters and economic shocks, driven by their fragile labor markets and high levels of vulnerable residents (Cutter, Ash, and Emrich 2016; Matthews et al. 2017; Weber and Miller 2017). During the first year of the pandemic, rural communities were found to be highly susceptible to COVID-19 spread and its most serious complications (Ameh et al. 2020; Peters 2020), and further lack the healthcare infrastructure more commonly available in urban regions (Miller et al. 2020). Given these conditions, the rural western study area experienced substantial negative impacts from the pandemic (Mueller et al. 2021).

In what follows, our analysis answers three related questions: First, to what extent did rural residents rely on informal social supports during this period, and were utilization

rates comparable to formal government program use? To answer this question, we directly compare estimates from the Rural U.S. West COVID-19 Survey (hereafter Rural West Survey) to estimates from the CPS-ASEC. Because prior literature has generally not evaluated formal government program use and informal social support simultaneously, it is not clear whether residents will rely on one more than another. Second, we investigate whether level of self-reported pandemic impact was associated with use of informal support, anticipating that residents most negatively affected by the pandemic will rely more extensively on informal support. Finally, we examine differences in informal support system use across demographic groups. Prior research on disaster aid and government safety nets suggests that not all demographic groups have equal access to or desire to utilize different forms of assistance. For this reason, we examine whether informal support is used differentially by residents of different ages, sex, level of educational attainment, and Latino/a identity.

Government safety net programs

Research on household strategies for weathering disasters or economic hardship tends to be bifurcated between analysis of formal government programs and analysis of informal, social network-based responses. In the case of the pandemic, there has been a proliferation of studies on various components of what is known as the U.S. “safety net,” which is the collection of government programs that provide direct cash as well as non-cash benefits to residents in need (Moffitt and Ziliak 2020). Research on the U.S. safety net’s response to the pandemic generally finds both widespread increases in government program use, but also limitations in programs’ ability to meet the full scale of need (M. Bitler et al. 2020a; Corallo 2022; Khorrami and Sommers 2021; Moffitt and Ziliak 2020; Ohri-Vachaspati et al. 2021).

The Families First Coronavirus Act and the CARES Act together provided billions of dollars in disaster relief, which were administered to households primarily through existing government programs. Among these pieces of legislation were important provisions to expand Unemployment Insurance and Supplemental Nutrition Assistance Program (SNAP), provide direct cash assistance in the form of Economic Impact Payments, and create a program that would substitute free and reduced school meals in the absence of in-person school attendance (M. Bitler et al. 2020a). Emerging research on the effects of these benefits finds that they played a significant role in poverty reduction (Han et al. 2020), reducing food insecurity, and increasing households’ ability to meet basic needs (Karpman and Acs 2020).

Yet, despite historic levels of spending towards disaster relief, the Families First Coronavirus Act and the CARES Act were still limited in their ability to fully counteract material hardships caused by the pandemic. Why were government programs limited in their impact even after receiving such substantial financial investment? While comprehensive evaluations of these Acts’ collective benefits and limitations are nascent,¹ several structural explanations stand out.

¹See M. Bitler, Hoynes, and Schanzenbach 2020a and Moffitt and Ziliak 2020 for more extensive analysis of government safety net infrastructure during the COVID-19 pandemic.

First, much relief spending relied on existing government program infrastructure for delivery. Prior to the pandemic in the 1990s, government safety net programs underwent substantial changes. Welfare policy reform in 1996 restructured safety net programs such that they primarily benefit working households, with far fewer options for non-working households (Danziger 2010; Tach and Edin 2017). Even while funding for the overall suite of government welfare programs expanded in gross monetary terms, the persistence of poverty – especially in rural areas (Thiede, Kim, and Valasik 2018) - suggests that safety net programs were not fully meeting the needs of many vulnerable U.S. residents (Edin and Shaefer 2015). During the early pandemic period of intermittent lockdowns and widespread job losses, the safety net's tethering of eligibility to work requirements made such programs especially fraught (M. Bitler, Hoynes, and Schanzenbach 2020b; Loprest and Nightingale 2018). In short, many existing safety net programs were designed to supplement income from employment, and not to fully take the place of long-term job loss (M. Bitler et al. 2020a).

Beyond pre-existing work requirements, federal relief funding during the pandemic was further limited by program eligibility requirements which excluded certain populations. For instance, legal status requirements restrict eligibility for certain safety net programs (Clark et al. 2020; Young et al. 2022), an especially important exclusion to note in the context of many rural communities which include undocumented residents (Nelson, Trautman, and Nelson 2015). Additionally, even for those who were eligible for government safety nets, program infrastructure was often overwhelmed by the sudden influx of applicants, causing delays or inability to access benefits (M. Bitler et al. 2020a). The CARES Act was also structured such that state governments were granted significant autonomy to allocate funds, which, in some instances, resulted in political conflicts and delays in funding disbursement (Rocco, Béland, and Waddan 2020).

Even among individuals who were both eligible and able to successfully navigate government application procedures, the amount of resources available in many cases was not sufficient to meet material needs (M. Bitler et al. 2020a). These limitations in the ability of formal government programs to fully provide for households during a period of such sudden and severe need suggests that households likely made up the difference by seeking additional support through informal channels.

In this study, we use the CPS-ASEC to measure rural U.S. West utilization of four programs that comprise much of the U.S. government safety net: (1) Social Security, (2) unemployment benefits, (3) Supplemental Nutrition Assistance Program (SNAP), and (4) Medicaid.

Social Security provides eligible people with a source of income when they retire. While this program is not designed to be responsive to macroeconomic shifts, it nevertheless provides financial resources for individuals 62 years or older who may have lost employment or sought early retirement, a trend that was documented during the pandemic (Davis et al. 2023).

Each U.S. state runs its own Unemployment Insurance (UI) program that pays eligible people money if they lose their job through no fault of their own. UI, along with SNAP, are designed to be responsive to sudden changes in economic conditions (M. P. Bitler, Hoynes, and Iselin 2020; Moffitt and Ziliak 2020). During the pandemic, UI use increased dramatically in response to widespread employment loss as well as temporarily expanded eligibility (Acs and Karpman 2020).

Supplemental Nutrition Assistance Program (SNAP) provides eligible people with benefits cards, used like debit cards, to buy food at authorized grocery stores and farmers markets. At the national level, research has documented that participation in SNAP had increased by 17% in May of 2020 relative to February of the same year, and that total government spending on SNAP programs had increased over 200% by July of 2020 (M. Bitler et al. 2020a).

Medicaid provides free or low-cost health benefits to low-income children and adults, with special provisions for pregnant women, seniors, and people with disabilities. The income threshold for Medicaid eligibility varies state-to-state, with the Affordable Care Act expanding access to the program among states that have opted to do so (Centers for Medicare and Medicaid Services, n.d.). While Medicaid enrollment had been declining in the two years prior to the pandemic, this trend reversed quickly during the business closures of 2020, as adults sought to replace employer-sponsored coverage lost due to unemployment (Corallo 2022). Starting in April of 2020, monthly enrollment in Medicaid steadily increased (Khorrami and Sommers 2021).

Per capita program participation across all four of these safety nets can be estimated with a high degree of confidence using routinely-collected government data, such as the CPS-ASEC - the annual supplement to the Current Population Survey which captures the economic characteristics of the US population. While providing a gold standard in terms of robust response rates and geographic coverage, the CPS-ASEC collects limited information on the informal strategies that households rely on during times of financial hardship. The novel survey fielded for this study uniquely allows us to examine the extent to which these informal, less-measured coping behaviors played a role in household disaster response. We first compare Rural West Survey estimates of formal government program use with comparable CPS-ASEC estimates. We then compare survey estimates of informal social support participation to CPS-ASEC estimates of formal government safety net use.

Informal social support

To contextualize informal social support use during the pandemic, we draw from research on both environmental disasters and economic downturns, recognizing that neither of these comparisons perfectly fits the experience of the pandemic. Like disasters such as hurricanes or earthquakes, the pandemic caused widespread societal disruption, but with impacts concentrated on social infrastructure such as education and healthcare systems rather than on physical infrastructure such as buildings. The pandemic's duration was much longer than most acute environmental disasters, and, in this way, was more akin macroeconomic shifts, such as the 2008 financial recession. While much environmental disaster research describes

informal social support in the post-disaster period, the time period examined in this study takes place fully *within* the disaster response period.

Our conceptual differentiation of formal and informal support is in line with Abramson et al.'s (2010) socioecological model of post-disaster recovery. This model posits a multi-dimensional measure of disaster recovery, which accounts for level of housing and economic stability, mental and physical health, and social role functioning within a household. While primarily emphasizing these component elements, the socioecological model identifies both formal and informal “help” as important mediators of recovery outcomes. In this model, informal help includes activities such as receiving financial support in an emergency or receiving help with housing, while formal help refers to relief services, especially geared towards housing recovery (Abramson et al. 2010: S49). While our study period takes place within the response period of the disaster event - prior to the recovery period which the socioecological model is focused on - our emphasis on formal and informal support provides context for understanding long-term pandemic recovery in the region.

Research on informal social support during disasters – often conceptually framed as social capital, social networks, or community resilience – predominantly tests relationships between measures of informal support and outcomes such as mortality or long-term recovery. Findings from this area overwhelmingly emphasize the robust relationship between strength of informal support systems and positive outcomes for disaster-affected residents. For instance, Klinenberg found that, during a major heat wave in Chicago, neighborhoods with stronger social ties had lower mortality rates (Klinenberg 2002). In the disaster recovery period, greater social capital has been described as an “engine of recovery” (Aldrich 2012:15), and is consistently found to correlate with faster or more robust recovery following floods (Akbar and Aldrich 2018; Zahnow et al. 2019), hurricanes (Abramson et al. 2010), earthquakes (Aldrich 2012; Hsueh 2019), and tornadoes (Sadri et al. 2018).

Sharing a household with relatives or nonkin is widely-documented within the U.S. as a social practice and source of informal social support used to weather financial hardship. Scholars have described the heightened prevalence of this practice, also known as “doubling up,” among families with young children, renters, Latino/a’s, single mothers, individuals with low educational attainment or income levels (Pilkauskas et al. 2014; Richard et al. 2022), and individuals who have lost employment within the previous four months (Wiemers 2014). Doubling up is also used as a disaster-response strategy (Aldrich 2012; Reid 2013) and the practice increased in prevalence across the U.S. in the two years following the 2008 financial recession (Mykyta and Macartney 2012). The financial benefits associated with doubling up (via rental or mortgage savings) are significant, in many cases comparable to the financial value of formal government safety net programs (Pilkauskas et al. 2014). However, despite financial savings, scholars have documented that doubling up can have long-term adverse health impacts on children living in the household (Harvey 2020), so it should not be considered a uniformly beneficial response to financial distress.

In addition to accessing informal support via personal networks, non-governmental organizations also provide financial and in-kind support. In fact, since the 1980’s, the provision of social services has increasingly devolved from government purview to

the private or non-profit sector (Marwell 2004; Salamon 1994), both of which now play substantial roles in the U.S. safety net (Howard 2023). In disaster contexts, non-governmental organizations have played key roles in meeting the needs of residents and supporting recovery (Aldrich 2012; Bolin and Stanford 1998; Klinenberg 2002). While non-government organizations would generally be expected to be a part of the informal disaster recovery landscape, they may be less prevalent in this study's rural sampling frame. There is a comparably low concentration of nonprofits in rural regions (Wu 2019), which instead tend to concentrate in urban areas (Hammack and Smith 2018). In the rural western U.S. in particular, there are fewer religious and civic organizations than in other rural regions across the country (Cutter et al. 2016).

This area of research highlights the critical role that informal, person-to-person and non-governmental organization assistance play in disaster recovery and weathering financial stress. Yet, research from environmental disaster scholarship has focused on more time-delimited disaster events, which are temporally distinct from the pandemic's multi-year duration and intermittent impacts, such as school and business closures. While reliance on social support during times of hardship is generally considered beneficial in disaster literature, it is possible that this same dependence could be a vulnerability in the long-term context of the pandemic. For instance, in their study of borrowing and lending practices within a social network following a cyclone, Islam and Nguyen conclude that, "when all households in the network are affected by a common shock, the extent to which a household can seek help from another network member is limited" (Islam and Nguyen 2018:264). Extrapolating to the pandemic context, we might expect that the capacity of informal networks to continue providing support may have been limited in a time when many people were experiencing concurrent impacts.

Demographic differences in use of informal support

Prior research suggests that informal social support will be utilized at different rates across demographic groups. We examine differences across sex, age, educational attainment, and Latino/a identity.

In non-disaster settings, females are documented to have larger social networks in the place where they live (Campbell and Lee 1992), while men are more likely to be socially isolated (Vandervoort 2000).² In disaster contexts, women have been shown to take on a larger share of household responsibilities (Enarson, Fothergill, and Peek 2018), especially when providing care for children (Tobin-Gurley, Peerk, and Loomis 2010). Thus, we would expect females to use informal social support to a greater degree than males.

Research suggests that older adults are more likely to live alone or to be socially isolated (Klinenberg 2016). As a result, we expect that older adults would be less likely to participate in informal social support compared to younger adults.

Educational attainment is often examined in disaster research, with the expectation that higher levels of education increase residents' ability to navigate government programs in

²Research in this area uses both sex (female, male, etc.) and gender (woman, man, etc.).

disaster settings (Elliott, Haney, and Sams-Abiodun 2010). Conversely, we expect residents with lower educational attainment to utilize informal support if they are less able to access formal government programs. Prior research suggests that both less educated and lower-income residents tend to rely more heavily on informal support (Hawkins and Maurer 2010; Pilkauskas et al. 2014). While education does not exactly correlate with income, the two are often used more generally as indicators of socioeconomic status (Braveman et al. 2005). Given this context, we would expect less-educated residents to participate in informal social systems at higher rates.

Finally, we give special attention to Latino/a identity as a key demographic group of interest for several reasons. First, there are a growing number of Latino/a residents in rural regions across the U.S. (Lichter 2012; Lichter and Johnson 2020); this demographic group makes up 18.1% of the rural West population (Appendix Table A1). Further, research on the pandemic has documented heightened economic impacts among Latino/a households (Vargas and Sanchez 2020) and heightened COVID-19 mortality rates among rural Latino/a's (Cheng, Sun, and Monnat 2020). While less examined, prior research suggests that Latino/a's may, on average, have less access to formal government programs. This trend has been documented in the use of both routine safety net programs and in certain disaster contexts (Bitler et al. 2021; Young et al. 2022). In cases in which Latino/a residents were unable to access formal government programs, we would also expect this population to utilize informal social systems to a greater degree.

The rural West geography which we examine includes a large number of Tribal Nations, and 6.2% of the region's population identifies as Native American (Appendix Table A1). Understanding COVID-19 impacts and the use of formal and informal disaster support among this diverse population is a critical component of building a comprehensive picture of pandemic experiences across rural regions. Unfortunately, our survey instrument did not yield sufficient responses from Native American respondents (23 in total, see Appendix Table A1) for us to responsibly generate estimates. Other non-white groups within the rural West make up a very small proportion of the overall population, and similarly include very few responses to the survey (Appendix Table A1). For these reasons, we include ethnicity (Latino/a or non-Latino/a) but not race in our demographic analyses. This is a limitation of our survey instrument and underscores the importance of more systematic data collection efforts that can describe informal disaster support behaviors with a large enough sample size to include detailed analyses of rural sub-populations.

Study Context

The rural U.S. West study region (Figure 1) is characterized by a geographically dispersed population intermixed throughout an extensive patchwork of federally-owned lands and some of the lowest rates of connectivity to urban areas in the country (Cutter et al. 2016). Relative to other rural regions in the U.S., rural western communities tend to have less diversified economies, which can render them more vulnerable to macroeconomic shifts (Cutter et al. 2016; Tickamyer and Duncan 1990). Demographically, this region is home to a large number of Native American Tribal Nations and growing Latino/a communities.

The survey was fielded during the first major wave of COVID-19 cases in the rural western region. While case counts during this early wave are retrospectively low compared to later waves, this time period corresponded to some of the earliest lockdowns, closures, and economic shocks of the pandemic, and was a time of widespread disruption.

Methods

Rural U.S. West COVID-19 Survey

We conducted a survey of all rural counties across eleven western states that was designed to yield results that are representative of the population with a sampling error of $\pm 3.1\%$ at the 95% confidence level. States sampled include: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. For this study, counties are defined as rural if they were categorized as non-metropolitan by the United States Office of Management and Budget according to the 2010 Census (USDA Economic Research Service 2020). Two hundred and seventy-eight total counties were included in our sampling frame.

Given the fast-changing circumstances of the pandemic at the time of data collection, the Rural West Survey was designed to be fielded quickly in a technique more similar to political polling than to traditional social science surveys. The survey was fielded by a professional survey firm, FM3, between June 25th and July 22nd of 2020, and collected a total of 1,009 responses. Households were selected randomly from the U.S. Postal Delivery Sequence File and matched with contact information from public databases. Selected households were contacted by phone and email, with a postcard being sent by mail if the first two modes did not yield a response. Due to the polling-style nature of the survey, a uniform number of contacts was not made. Only respondents 18 years or older were permitted to complete the survey, and interviews were available in both English and Spanish. Within each household contacted, the survey was randomized by the adult with the most recent birthday. Ultimately, 509 surveys were collected by phone, 276 by text message, and 224 by email. The survey was conducted with approval from Yale University's Human Research Protection Program (exemption determination ID#2000027941).

We utilized soft quotas and over-sampling in an attempt to collect representative responses from Native Americans, Latino/a's, and young adults - groups which are historically harder to reach in rural surveys. The survey's contact rate was 3.0% and its complete interview response rate was 1.1%, calculated using standard AAPOR rates (AAPOR 2016). As expected with data collection more akin to polling than traditional surveys, these response rates are lower than what is traditionally desirable. Further, given the polling-style nature of this data collection effort, wherein we cast a wide net and halted data collection after achieving a desired N, a conventional response rate is not entirely appropriate or applicable. That said, this approach generated a point-in-time snapshot of data valuable for understanding the impact of the COVID-19 pandemic in a context in which a more traditional survey would have been infeasible.

Finally, to better align the sample with characteristics of the target population, we applied post-stratification rake weights by state, age, education, sex, Native American identity, and

Latino/a identity. Weights were developed to align with 2010 Census estimates. After this process, weighted responses largely aligned with 2014–2018 American Community Survey population estimates for the region (see Appendix Table A1) (U.S. Census Bureau n.d.). Education was the main variable for which weights did not yield similar estimates, with our sample over-representing more educated residents.

CPS-ASEC Data—The CPS-ASEC is a nationwide survey conducted by the U.S. Census Bureau and the Bureau of Labor Statistics. The ASEC supplement, formerly known as the March supplement, surveys over 75,000 households, documenting trends in poverty, income, and government program use (U.S. Census Bureau and Bureau of Labor Statistics 2021). To closely mirror the Rural West Survey sampling frame of non-metropolitan western counties, we extract 2021 CPS-ASEC data (Flood et al. 2021) for the same eleven western states and for counties considered “not in [a] metro area.” The 2021 CPS-ASEC corresponds to conditions in 2020, and was conducted in March of 2021. We select variables that document the use of four central government safety net programs: Social Security, unemployment benefits, Medicaid, and SNAP (full variable descriptions available in Appendix) and apply ASEC-specific household weights to our estimates (U.S. Census Bureau 2019).

The CPS-ASEC represents some of the best publicly-available data with which to examine social disruption during the pandemic in the U.S. Substantial government resources are invested into annual data collection, resulting in a 76% response rate in 2021 (U.S. Census Bureau and Bureau of Labor Statistics 2021). However, the pandemic negatively affected CPS survey collection, illustrating the difficulty of collecting empirical survey data during this specific period of time. Given safety concerns, 2021 CPS-ASEC interviews were primarily conducted over the phone, rather than in-person as historically has been standard. During 2020, CPS response rates dropped by ten percentage points across all households, and by twenty percentage points for households being sampled for the first time. While response rates rebounded slightly during the 2021 CPS, Census Bureau researchers note that demographic differences between the survey’s respondents and non-respondents grew larger during this year (U.S. Census Bureau and Bureau of Labor Statistics 2021: G-9).

Dependent Variables—We report both aggregate participation in formal government safety nets as well as utilization of specific programs, comparing estimates from the Rural West Survey and the CPS-ASEC. In the Rural West Survey, residents were asked whether they had received assistance from any of the following programs within the previous month: unemployment benefits, Medicaid, Social Security, and SNAP or food stamps. If respondents used any of these four programs (regardless of the total number), they were considered to have received formal government assistance. We construct the comparable measure from CPS-ASEC data in the same way.

We model both aggregate participation in informal social support and utilization of specific modes of social support, drawing from three survey questions (see Appendix for full question wording). First, respondents were asked whether they had received assistance from any of the following within the previous month: financial support from friends or family, supplies from a foodbank, or financial support from a community- or faith-based organization. Second, respondents were asked whether they had given any financial support

to friends or family since the pandemic began. Finally, respondents were also asked whether other people, such as friends or family, had moved in with them since the pandemic began. If respondents participated in any of these five forms of informal social support (regardless of total number), they were designated as having received aggregate informal social support. Full survey questions are reported in the Appendix.

Predictor Variables—We utilize two primary types of independent variables - indicators of pandemic impacts and demographic covariates. The first two measures of impact were created using a question that asked respondents to self-rate how the coronavirus pandemic had personally impacted their overall life and their household finances on a scale of 1 (extremely negative) to 10 (extremely positive), with 5 indicating no impact. Responses were binned into three outcomes, negative overall life or negative financial impacts (1–4), no impact (5), and positive overall life or positive financial impacts (6–10). The third measure of impact calculated whether a respondent had lost employment since the pandemic began.

Demographic variables include sex, Latino/a identity, education level, and age. These characteristics are selected because disasters have been shown to differentially affect specific subpopulations along these axes (Enarson et al. 2018; Fothergill, Maestas, and Darlington 1999; Fothergill and Peek 2004). Education is grouped into less than high school, received a high school diploma or GED, some college, received a Bachelors or Associates, or received a graduate or professional degree. Sex includes only self-identified female or male respondents. While “Other” was provided as an option for this question, no respondents identified in this way. Age is grouped into 18–34, 35–49, 50–64, and 65+ years. While details on respondents’ race were collected in the survey, we elect not to include this variable due to relatively low response counts from non-white residents. Descriptions of the sample and the nonmetropolitan U.S. West target population are reported in Appendix Table A1.

Analysis

We first report descriptive statistics of residents’ use of government programs and informal social support systems. Descriptive point estimates are reported with a 95% confidence interval. Next, we report two sets of models, the first of which analyzes the relationships between various pandemic impacts and informal social support use. The second evaluates the extent to which different demographic groups utilized different forms of informal social support.³

While nonlinear probability models (NLPMs) such as logistic or probit regression are commonly used in sociological research to estimate binary outcomes, we opt instead to use linear probability models (LPMs) for several reasons. First, scholars have highlighted that logit coefficients should generally not be compared in same-sample, nested NLPMs. Further, coefficients of NLPMs fitted on different groups - a central component of our analysis - are not directly comparable (Allison 1999; Breen, Karlson, and Holm 2018; Mood 2010).

³Appendix Table A3 reports demographic differences in use of formal government support programs, modeled from the Rural West Survey estimates. We elected not to include these models in our main results because we do not have details on respondents’ underlying eligibility for these programs.

To address these particular limitations of NLPMs, Breen et al. 2018 recommend the use of LPMs, which are increasingly accepted as an alternative approach that can provide more interpretable coefficients (Hellevik 2009). To address the primary concern raised by LPMs - heteroskedastic and non-normal residuals - we compute HC2, or Neyman, robust standard errors using the estimatr package (Blair et al. 2018). We perform all analysis in R statistical software version 3.6.3. Results are reported at the $p < .05$ level.

Results

Descriptive Results

CPS-ASEC estimates indicate that over half (58% CI [56.2, 61.0]) of rural U.S. West residents relied on at least one formal government safety net program during 2020. Use was concentrated more heavily in Medicaid (24.8% CI [22.7, 26.9]) and Social Security (28.5% CI [26.2, 30.7]), both routine programs that are not designed to respond to sudden macroeconomic shifts. Programs specifically designed to support households during periods of financial hardship, SNAP (15.8% CI [14.0, 17.7]) and unemployment benefits (10.1% CI [8.6, 11.7]), were used at substantially lower rates.

We consider the CPS-ASEC estimates to be a gold standard for population representative surveys during this period. By comparing CPS-ASEC estimates to comparable measures in the Rural West Survey, we are able to gain insight into the direction of potential bias in our survey results, which could emerge from the survey's low response rate as well as potential under-reporting of assistance use due to associated stigmas. That said, even though differences between our estimates and federal statistics may indicate a degree of bias in Rural West Survey estimates, differences may also be due to the distinctly different reporting periods between the two instruments; the Rural West Survey questions primarily cover the period of May to July of 2020, while the CPS-ASEC covers the entire year of 2020, thus including an additional five to six months more than our survey instrument. Thus, from an a priori perspective we would expect our Rural West Survey estimates to suggest lower formal safety net usage due to a shorter reporting period. This means that if we observed higher usage in our data we would likely have evidence of bias, but if federal statistics report higher usage, we are ultimately unable to distinguish differences due to bias versus reporting period.

In line with expectations stemming from differences in reporting periods, we find that CPS-ASEC estimates report consistently higher levels of formal government program use than the Rural West Survey (Table 1). Rates of SNAP benefit use, Medicaid coverage, and receipt of Social Security payments were all approximately twice as large in the CPS-ASEC as estimates from the novel survey instrument. The only divergence in this trend is for unemployment benefits, where the Rural West Survey estimates 12.3% CI [9.4, 15.2] of the target population received this benefit while the CPS-ASEC estimates only 10.1% CI [8.6, 11.7]. However, confidence intervals for these two point estimates overlap, suggesting no significant difference between the two. It is possible that these differences result from the Rural West Survey underestimating rural reliance on formal government support during this period. However, it is also possible that these differences represent real temporal differences in program uptake over the course of 2020, as this period saw marked increases in use of

SNAP, unemployment benefits, and Medicaid (Moffitt and Ziliak 2020). This trend provides important context in which to evaluate Rural West Survey estimates of informal social support use during the pandemic period. While imperfect due to its rapid deployment, the Rural West Survey offers estimates of informal disaster coping behaviors, most of which are not measured by the CPS-ASEC.

We find that more than half (52.3% CI [48.1, 56.4]) of rural U.S. West residents participated in some form of informal social support, either from a non-governmental organization or through person-to-person support. Giving financial assistance to friends or family was most commonly reported (38.0% CI [33.9, 42.1]), followed by having a friend or family member move into the household (19.3% CI [15.9, 22.7]). Residents reported lower rates of receiving assistance from friends or family (9.4% CI [6.7, 12.2]), and the least-used informal social supports were from food pantries (6% CI [3.8, 8.2]) and community- or faith-based organizations (3.2% CI [1.6, 4.8]).

Pandemic impacts & informal social support use

In order to fully leverage our unique ability to understand the use of informal social support within the Rural West Survey data, we next model associations between pandemic impact and use of informal social support, expecting that residents who report more severe impacts will utilize informal support at higher levels. Model results are in line with this expectation, suggesting that those residents who experienced negative overall impacts, negative financial impacts, or employment loss during the initial wave of the pandemic were significantly more likely to participate in informal social support (Table 2, Models A, B, and C). Compared to those who reported no impacts from the pandemic, those who reported negative financial impacts were 16 percentage points ($p < .001$, $SE = .05$) more likely to participate in at least one form of informal social support, followed by those who reported job loss who were 14 percentage points ($p < .05$, $SE = .06$) more likely to do so. Those who reported negative overall impact were similarly 13 percentage points ($p < .05$, $SE = .05$) more likely to utilize informal social support.

While overall use of informal support was consistently higher among negatively affected residents for the three different forms of pandemic impact modeled (overall impact, financial impact, and job loss), each impact was associated with a different set of informal support behaviors. For instance, overall pandemic impacts - both negative *and* positive - were significantly associated with higher levels of giving financial support to friends or family, but were not associated with any other forms of informal support (Table 2, Model A). In contrast, those who reported negative financial impacts from the pandemic were more likely to report participating in a wider set of informal supports, including receiving assistance from a foodbank or community- or faith-based organization, as well as giving or receiving assistance from friends or family (Table 2, Model B). Finally, respondents who experienced employment loss during the pandemic period only reported higher levels of receiving financial assistance from friends or family, but no difference in other forms of informal support relative to residents who did not experience employment loss (Table 2, Model C). Notably, across all three forms of pandemic impact modeled, doubling up is the only form of informal support that is never associated with negative pandemic impacts. Together, these

results indicate that, among those most affected by the pandemic and its corresponding economic effects, households relied on a range of different informal strategies to weather its impacts.

Informal social support participation across demographic groups

Finally, we examine whether certain demographic groups were more or less likely to utilize informal social support during the pandemic period, presenting multivariable models as our primary specification (Table 3). Prior research leads us to hypothesize that less-educated residents, females, younger residents, and Latino/a's will engage in informal support at higher rates. Our findings are largely in line with these expectations.

When modeling aggregate use of informal support (Table 3, Any Informal Model), we find that Latino/a's were the only demographic group to report significantly higher levels of participation (.23, $p < .001$, $SE = .07$). However, this pattern shifts as we examine component types of informal social support. Among organizational forms of support, females were slightly more likely to report receiving assistance from food banks than males (.05, $p < .05$, $SE = .02$), while those with a high school degree or GED were slightly less likely to report having received assistance from a community- or faith-based organization relative to those with a college degree ($-.03$, $p < .05$, $SE = .01$). Among person-to-person support, the youngest age group examined, 18–34 years of age, had the highest probability of receiving financial assistance from friends or family. The probability of receiving this form of support decreased in successively greater degrees among older age groups; the greatest difference in receiving assistance was between the youngest age group and the oldest, those 65 years or older ($-.17$, $p < .001$, $SE = .05$). In contrast to receiving assistance from friends or family, the primary demographic predictor of giving financial assistance was Latino/a identity, with Latino/a residents significantly more likely to have given support to friends or family during the pandemic period than non-Latino/a's (.18, $p < .05$, $SE = .08$). Finally, females were significantly more likely to have had a friend or family member move into the home than males (.08, $p < .05$, $SE = .04$).

Given the pandemic's uneven impacts across demographic groups (Abedi et al. 2021), it is possible that the differences in support use identified in our models are an expression of these differential disaster impacts. To assess whether this is the case, we provide an alternative set of model specifications in Appendix Table A2 that account for baseline level of COVID-19 impact. These alternative specifications are set up the same as the models presented in Table 3 but include self-reported pandemic impact on household finances as a control variable. Point estimates from these alternative specifications are substantively very similar to those presented in Table 3 with no differences in coefficient direction or significance.

Discussion

The early period of the pandemic was characterized by widespread job loss, housing insecurity, and financial stress (Benfer et al. 2021; M. Bitler et al. 2020a). While government safety net programs helped to blunt the pandemic's negative financial effects among many households (Han et al. 2020), they were limited in their ability to fully meet material needs

(M. Bitler et al. 2020a; Moffitt and Ziliak 2020; Ohri-Vachaspati et al. 2021). Results from this study illustrate how rural western households relied on both formal government programs as well as less-documented modes of informal social support, especially person-to-person assistance such as financial lending between friends and family.

On aggregate, rural U.S. West residents engaged in these informal practices at nearly as high a rate as they relied on formal government safety net programs, with 52.3% CI [48.1, 56.4] (Rural West Survey) of respondents having participated in at least one informal support behavior compared to 58.6% CI [56.2, 61.0] (CPS-ASEC) who utilized at least one government safety net program. This finding affirms Abramson et al.'s (2010) socioecological model, that both formal safety net programs and informal social support play an important role in both the response and recovery period of a disaster. High levels of informal support use may further indicate that formal government safety net programs were not fully meeting rural residents' needs during this period, or that residents were not accessing available support.

Among informal strategies examined, giving financial assistance was the most widely practiced, with nearly two in five rural residents having done so since the pandemic began. This is a surprising contrast to the much lower rate of residents who reported receiving assistance from friends or family, only one in ten who reported having done so. This could be due to a slight difference in the reporting period for survey questions on giving versus receiving (see Appendix for question wording). Further, while we are not able to determine whether or not this is the case, it is possible that the Rural West Survey captured fewer residents of lower socioeconomic status due to the well-established difficulties in obtaining surveys from low socioeconomic status households, which in turn could have influenced the difference between reported giving and receiving assistance. This gap may also be due to respondents under-reporting receipt of assistance due to associated social stigmas, which have been documented in the context of government programs (Stuber and Schlesinger 2006). It could also be an actual expression of rural residents giving financial assistance at a higher rate than receiving, possibly to friends and family in a different geographic region.

Doubling up was also widely practiced, with nearly one in five residents having had a friend or family member move in with them since the pandemic began. However, doubling up was the only mode of informal social support not significantly associated with any type of negative pandemic impact, suggesting that shared housing may be an ongoing support practice, rather than one that was used specifically in conjunction with changing pandemic conditions. Organizational supports – through food banks, community-based, or faith-based organizations – were the least-used form of informal support, with fewer than one in ten residents having done so. This is in keeping with the relatively low concentration of non-government organizations in rural regions (Wu 2019).

As anticipated, residents who reported negative pandemic impacts relied more extensively on informal social support, including both organizational support from food banks, community-based, or faith-based groups, as well as person-to-person assistance in the form of giving or receiving financial assistance from friends or family. Notably, those who reported negative overall and negative financial impacts from the pandemic were

significantly more likely to report that they gave financial assistance to others. It is possible that the relationship between participation in informal support systems and pandemic impacts is endogenous; in other words, residents may report negative COVID-19 impacts on their lives and finances because they are financially supporting friends or family. While the study cannot fully disentangle whether reported hardship was in part or fully the result of this informal giving, or completely independent, our findings do suggest that many of those most burdened by the pandemic were financially supporting people beyond their immediate households.

Demographic variation in use of informal support systems was also largely in line with our expectations, with females, Latino/a's, and younger residents participating at higher levels in various modes of support. Because Rural West Survey data were collected during the early stages of the pandemic, it is possible that further cleavages in material need or in use of informal support may have emerged over a longer period of time. The distinct use patterns we observe early in the disaster across different forms of informal support suggest that rural subpopulations utilize different coping strategies in disaster settings. Examining why these demographic differences emerge is an important direction for future research.

Our findings illustrate that informal strategies – especially those that operated within person-to-person social networks – were widely used by rural households during the early pandemic. Many of these practices are not captured in routine data collection efforts, and suggest a much broader suite of coping behaviors in response to disaster impacts beyond the use of government programs. Future disaster-focused research would benefit from examining both formal and informal safety net use in tandem, and more systematic collection of data on informal social support is needed to do so. Among the informal support variables that we measure, doubling up has the best existing data collection infrastructure (see Mykyta and Macartney 2012 and Richard et al. 2022).

From one vantage point, the use of informal, person-to-person social support during the pandemic might seem to confirm common tropes of rural self-reliance. Disaster scholarship would further suggest that these trends bode well for the long-term recovery of the region. However, an interpretation of our findings as merely rural “resilience” risks overlooking the ways that informal social support behaviors, such as giving money to a family member or letting a friend move into one’s home, can themselves be burdensome. Further, the scale of pandemic impacts means that the affected population is much larger than in the case of an environmental disaster. While households may have been differentially impacted, there is no community that lies geographically outside of the pandemic to turn to, in the way that residents affected by a hurricane might seek support from friends or family who live outside of the hurricane’s path. This widespread exposure to pandemic impacts means that residents’ social networks may be more limited in their ability to provide informal support. Person-to-person networks may not have been able to continue providing the same level of support for the long duration of intermittent pandemic impacts. With these conditions in mind, the heavy reliance of rural residents on informal social support during the early period of the pandemic may be a vulnerability, and does not necessarily predict a strong recovery.

There are several limitations to this study. First, the Rural West Survey was fielded in a relatively short time frame to best capture a snapshot of rapidly changing social conditions in hard-to-reach rural communities. This polling-style approach necessarily traded off with the survey's ability to obtain a response rate as high as would traditionally be expected in social science research, as the survey team was unable to conduct extensive follow-up to non-responses and the survey was closed as soon as the desired N was obtained. As such, while our survey weighting procedure did ultimately yield a sample that is largely in line with the demographics of the target population, there is still the possibility of indiscernible bias in our response.

Second, we do not report pre-pandemic rates of government program use or informal social support participation, and, as such, cannot describe how distinct the rates reported here are from non-disaster conditions. While changes in rates can be constructed for formal government programs via alternative data sources such as the CPS, they cannot for most of the informal practices that we find to be widely prevalent. Both limitations of the Rural West Survey point to the need for more robust survey infrastructure that captures informal support behaviors.

Conclusion

Compared to government program use, informal social support behaviors are less systematically measured by routine government surveys, which offer the gold standard in terms of survey representativeness and geographic coverage. When it comes to rural populations, it is even less likely that baseline data exist. This means that, when an unexpected disaster occurs, there are limited established data sources that are already set up to longitudinally track how affected households use person-to-person or non-governmental support networks. Findings from the Rural West Survey illustrate that informal support behaviors, such as providing financial assistance through social networks, were widely practiced during this early pandemic period of rapid social change. This suggests that disaster research focused exclusively on government program use will fail to describe a full picture of how households respond to sudden shock events.

Further, we find that informal practices were used at higher rates by residents who were the most impacted by the pandemic, and that different types of informal support were used to varying degrees by different demographic groups. These findings point to the need for research focused specifically on informal disaster response behaviors, which may shed important light on the disaster experiences of rural subpopulations – particularly rural residents of color - that are often overlooked in data collection. Research on informal support will be especially important among rural residents who may lack access to formal government safety programs and subsequently turn to social networks or non-governmental organizations to meet their needs. Looking to a future of increasingly frequent environmental disasters and the potential for emergent pandemic events, more formalized collection of data on informal support behaviors would hold great value for future research and for informing more effective policies to support rural households during periods of disaster.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

This research was supported by the National Science Foundation Sociology Program under Grant #2029990, “RAPID: Impacts of COVID-19 Pandemic on Rural Attitudes about Federal Aid and Recovery” (awarded to Justin Farrell, Yale University). It was further supported by the National Science Foundation Sociology and Human-Environment and Geographical Sciences (HEGS) Award #1850871, “Analysis of Impacts of Environmental and Natural Hazards on Human Migration” (awarded to Elizabeth Fussell, Brown University; Jack DeWaard, University of Minnesota; Katherine Curtis, University of Wisconsin-Madison; and Jonathan Schroeder, University of Minnesota). Paul Berne Burow was supported by the Agriculture and Food Research Initiative grant no. 2020-67034-31894/ project accession no. 1023124 from the USDA National Institute of Food and Agriculture. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation or the USDA. Kathryn McConnell was supported by the Population Studies and Training Center at Brown University through the generosity of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (P2C HD041020 and T32 HD007338). This paper is based on Chapter 4 of Kathryn McConnell’s dissertation. Thank you to Katie Pofahl for research support.

Data availability statement:

Data are available at <https://osf.io/64ezg/>.

References

- AAPOR. 2016. “Standard Definitions: Final Dispositions of Case Codes and Outcomes Rates for Surveys.” 81.
- Abedi Vida, Olulana Oluwaseyi, Avula Venkatesh, Chaudhary Durgesh, Khan Ayesha, Shahjouei Shima, Li Jiang, and Zand Ramin. 2021. “Racial, Economic, and Health Inequality and COVID-19 Infection in the United States.” *Journal of Racial and Ethnic Health Disparities* 8(3):732–42. doi: 10.1007/s40615-020-00833-4. [PubMed: 32875535]
- Abramson David M., Stehling-Ariza Tasha, Park Yoon Soo, Walsh Lauren, and Culp Derrin. 2010. “Measuring Individual Disaster Recovery: A Socioecological Framework.” *Disaster Medicine and Public Health Preparedness* 4(S1):S46–54. doi: 10.1001/dmp.2010.14. [PubMed: 23105035]
- Acs Gregory, and Karpman Michael. 2020. *Employment, Income, and Unemployment Insurance during the COVID-19 Pandemic: Findings from the May 14–27 Coronavirus Tracking Survey*. Washington, D.C.: Urban Institute.
- Akbar Muhammad Siddique, and Aldrich Daniel P. 2018. “Social Capital’s Role in Recovery: Evidence from Communities Affected by the 2010 Pakistan Floods.” *Disasters* 42(3):475–97. doi: 10.1111/disa.12259. [PubMed: 29131374]
- Aldrich Daniel P. 2012. *Building Resilience Social Capital in Post-Disaster Recovery*. Chicago: The University of Chicago Press.
- Allison Paul D. 1999. “Comparing Logit and Probit Coefficients Across Groups.” *Sociological Methods & Research* 28(2):186–208. doi: 10.1177/0049124199028002003.
- Ameh Governor G., Njoku Anuli, Inungu Jeff, and Younis Mustafa. 2020. “Rural America and Coronavirus Epidemic: Challenges and Solutions.” *European Journal of Environment and Public Health* 4(2):em0040. doi: 10.29333/ejeph/8200.
- Benfer Emily A., Vlahov David, Long Marissa Y., Walker-Wells Evan, Pottenger JL, Gregg Gonsalves, and Keene Danya E.. 2021. “Eviction, Health Inequity, and the Spread of COVID-19: Housing Policy as a Primary Pandemic Mitigation Strategy.” *Journal of Urban Health* 98(1):1–12. doi: 10.1007/s11524-020-00502-1.
- Bitler Marianne, Gennetian Lisa A., Christina Gibson-Davis, and Rangel Marcos A.. 2021. “Means-Tested Safety Net Programs and Hispanic Families: Evidence from Medicaid, SNAP, and WIC.”

- The ANNALS of the American Academy of Political and Social Science 696(1):274–305. doi: 10.1177/00027162211046591. [PubMed: 37284021]
- Bitler Marianne, Hoynes Hilary, and Schanzenbach Diane Whitmore. 2020a. The Social Safety Net in the Wake of COVID-19. w27796. Cambridge, MA: National Bureau of Economic Research. doi: 10.3386/w27796.
- Bitler Marianne, Hoynes Hilary, and Schanzenbach Diane Whitmore. 2020b. “Why the Safety Net Might Not Respond as Effectively to COVID-19 As It Should.” Milbank Memorial Fund. Retrieved November 6, 2020.
- Bitler Marianne P., Hoynes Hilary W., and Iselin John. 2020. “Cyclicalities of the U.S. Safety Net: Evidence from the 2000s and Implications for the Covid-19 Crisis.” National Tax Journal 73(3):759–80. doi: 10.17310/ntj.2020.3.06.
- Blair Graeme, Cooper Jasper, Coppock Alexander, Humphreys Macartan, Sonnet Luke, and Fultz Neal. 2018. “Package ‘Estimatr.’” Stat 7(1):295–318.
- Bolin Robert, and Stanford Lois. 1998. “The Northridge Earthquake: Community-Based Approaches to Unmet Recovery Needs.” Disasters 22(1):21–38. doi: 10.1111/1467-7717.00073. [PubMed: 9549171]
- Braveman Paula A., Cubbin Catherine, Egerter Susan, Chideya Sekai, Marchi Kristen S., Metzler Marilyn, and Posner Samuel. 2005. “Socioeconomic Status in Health Research One Size Does Not Fit All.” JAMA 294(22):2879–88. doi: 10.1001/jama.294.22.2879. [PubMed: 16352796]
- Breen Richard, Karlson Kristian Bernt, and Holm Anders. 2018. “Interpreting and Understanding Logits, Probits, and Other Nonlinear Probability Models.” Annual Review of Sociology 44(1):39–54. doi: 10.1146/annurev-soc-073117-041429.
- Campbell Karen E., and Lee Barrett A.. 1992. “Sources of Personal Neighbor Networks: Social Integration, Need, or Time?.” Social Forces 70(4):1077–1100. doi: 10.1093/sf/70.4.1077.
- Centers for Medicare and Medicaid Services. n.d. “Medicaid Eligibility.” Retrieved June 13, 2023 (<https://www.medicaid.gov/medicaid/eligibility/index.html>).
- Cheng Kent Jason G., Sun Yue, and Monnat Shannon M.. 2020. “COVID-19 Death Rates Are Higher in Rural Counties With Larger Shares of Blacks and Hispanics.” The Journal of Rural Health 36(4):602–8. doi: 10.1111/jrh.12511. [PubMed: 32894612]
- Clark Eva, Fredricks Karla, Laila Woc-Colburn Maria Elena Bottazzi, and Weatherhead Jill. 2020. “Disproportionate Impact of the COVID-19 Pandemic on Immigrant Communities in the United States.” PLOS Neglected Tropical Diseases 14(7):e0008484. doi: 10.1371/journal.pntd.0008484.
- Corallo Bradley. 2022. Analysis of Recent National Trends in Medicaid and CHIP Enrollment. Kaiser Family Foundation.
- Cutter Susan L., Ash Kevin D., and Emrich Christopher T.. 2016. “Urban–Rural Differences in Disaster Resilience.” Annals of the American Association of Geographers 106(6):1236–52. doi: 10.1080/24694452.2016.1194740.
- Danziger Sandra K. 2010. “The Decline of Cash Welfare and Implications for Social Policy and Poverty.” Annual Review of Sociology 36:523–45.
- Davis Owen F., Quinby Laura D., Rutledge Matthew S., and Wettstein Gal. 2023. “How Did COVID-19 Affect the Labor Force Participation of Older Workers in the First Year of the Pandemic?” Journal of Pension Economics & Finance 1–15. doi: 10.1017/S1474747223000045.
- Edin Kathryn J., and Shaefer H. Luke. 2015. \$2.00 a Day: Living on Almost Nothing in America. New York: Houghton Mifflin Harcourt.
- Elliott James R., Haney Timothy J., and Sams-Abiodun Petrice. 2010. “Limits to Social Capital: Comparing Network Assistance in Two New Orleans Neighborhoods Devastated by Hurricane Katrina.” The Sociological Quarterly 51(4):624–48. doi: 10.1111/j.1533-8525.2010.01186.x. [PubMed: 20939128]
- Enarson Elaine, Fothergill Alice, and Peek Lori. 2018. “Gender and Disaster: Foundations and New Directions for Research and Practice.” Pp. 205–23 in Handbook of Disaster Research, Handbooks of Sociology and Social Research, edited by Rodríguez H, Donner W, and Trainor JE. Cham: Springer International Publishing.

- Flood Sarah, King Miriam, Rodgers Renae, Ruggles Steven, Robert Warren J., and Westberry Michael. 2021. Integrated Public Use Microdata Series, Current Population Survey: Version 9.0 CPS-ASEC. Minneapolis, MN: IPUMS.
- Fothergill Alice, Maestas Enrique G. M., and Darlington JoAnne DeRouen. 1999. "Race, Ethnicity and Disasters in the United States: A Review of the Literature." *Disasters* 23(2):156–73. doi: 10.1111/1467-7717.00111. [PubMed: 10379098]
- Fothergill Alice, and Peek Lori A.. 2004. "Poverty and Disasters in the United States: A Review of Recent Sociological Findings." *Natural Hazards* 32(1):89–110. doi: 10.1023/B:NHAZ.0000026792.76181.d9.
- Hammack David C., and Smith Steven Rathgeb. 2018. *American Philanthropic Foundations: Regional Difference and Change*. Indiana University Press.
- Han Jeehoon, Meyer Bruce D., and Sullivan James X.. 2020. *Income and Poverty in the COVID-19 Pandemic*. Cambridge, Mass: National Bureau of Economic Research.
- Harvey Hope. 2020. "Cumulative Effects of Doubling Up in Childhood on Young Adult Outcomes." *Demography* 57(2):501–28. doi: 10.1007/s13524-020-00860-0. [PubMed: 32207060]
- Hawkins Robert L., and Maurer Katherine. 2010. "Bonding, Bridging and Linking: How Social Capital Operated in New Orleans Following Hurricane Katrina." *The British Journal of Social Work* 40(6):1777–93. doi: 10.1093/bjsw/bcp087.
- Hellevik Ottar. 2009. "Linear versus Logistic Regression When the Dependent Variable Is a Dichotomy." *Quality & Quantity* 43(1):59–74. doi: 10.1007/s11135-007-9077-3.
- Hsueh Hsin-Yi. 2019. "The Role of Household Social Capital in Post-Disaster Recovery: An Empirical Study in Japan." *International Journal of Disaster Risk Reduction* 39:101199. doi: 10.1016/j.ijdr.2019.101199.
- Howard Christopher. 2023. *Who Cares: The Social Safety Net in America*. Oxford, New York: Oxford University Press.
- Islam Asad, and Nguyen Chau. 2018. "Do Networks Matter after a Natural Disaster? A Study of Resource Sharing within an Informal Network after Cyclone Aila." *Journal of Environmental Economics and Management* 90:249–68. doi: 10.1016/j.jeem.2018.06.007.
- Karpman Michael, and Acs Gregory. 2020. *Unemployment Insurance and Economic Impact Payments Associated with Reduced Hardship Following CARES Act*. Urban Institute.
- Khorrami Peggah, and Sommers Benjamin D.. 2021. "Changes in US Medicaid Enrollment During the COVID-19 Pandemic." *JAMA Network Open* 4(5):e219463. doi: 10.1001/jamanetworkopen.2021.9463.
- Klinenberg Eric. 2002. *Heat Wave: A Social Autopsy of Disaster in Chicago*. University of Chicago Press.
- Klinenberg Eric. 2016. "Social Isolation, Loneliness, and Living Alone: Identifying the Risks for Public Health." *American Journal of Public Health* 106(5):786–87. doi: 10.2105/AJPH.2016.303166. [PubMed: 27049414]
- Lichter Daniel T. 2012. "Immigration and the New Racial Diversity in Rural America." *Rural Sociology* 77(1):3–35. doi: 10.1111/j.1549-0831.2012.00070.x.
- Lichter Daniel T., and Johnson Kenneth M.. 2020. "A Demographic Lifeline? Immigration and Hispanic Population Growth in Rural America." *Population Research and Policy Review* 39(5):785–803. doi: 10.1007/s11113-020-09605-8.
- Loprest Pamela, and Nightingale Demetra. 2018. *The Nature of Work and the Social Safety Net*. Urban Institute.
- Marwell Nicole P. 2004. "Privatizing the Welfare State: Nonprofit Community-Based Organizations as Political Actors." *American Sociological Review* 69(2):265–91. doi: 10.1177/000312240406900206.
- Matthews Kevin A., Croft Janet B., Liu Yong, Lu Hua, Kanny Dafna, Wheaton Anne G., Cunningham Timothy J., Khan Laura Kettel, Caraballo Ralph S., Holt James B., Eke Paul I., and Giles Wayne H.. 2017. "Health-Related Behaviors by Urban-Rural County Classification — United States, 2013." *MMWR Surveillance Summaries* 66(5):1–8. doi: 10.15585/mmwr.ss6605a1.

- Miller Ian F., Becker Alexander D., Grenfell Bryan T., and Metcalf C. Jessica E.. 2020. "Disease and Healthcare Burden of COVID-19 in the United States." *Nature Medicine* 26(8):1212–17. doi: 10.1038/s41591-020-0952-y.
- Moffitt Robert A., and Ziliak James P.. 2020. "COVID-19 and the US Safety Net." *Fiscal Studies* 41(3):515–48. doi: 10.1111/1475-5890.12243. [PubMed: 33362310]
- Mood C 2010. "Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It." *European Sociological Review* 26(1):67–82. doi: 10.1093/esr/jcp006.
- Mueller J. Tom, McConnell Kathryn, Burow Paul Berne, Pofahl Katie, Merdjanoff Alexis A., and Farrell Justin. 2021. "Impacts of the COVID-19 Pandemic on Rural America." *Proceedings of the National Academy of Sciences* 118(1). doi: 10.1073/pnas.2019378118.
- Mykyta Laryssa, and Macartney Suzanne. 2012. *Sharing a Household: Household Composition and Economic Well-Being: 2007–2010*. Current Population Report. United States Census Bureau.
- Nelson Lise, Trautman Laurie, and Nelson Peter B.. 2015. "Latino Immigrants and Rural Gentrification: Race, 'Illegality,' and Precarious Labor Regimes in the United States." *Annals of the Association of American Geographers* 105(4):841–58. doi: 10.1080/00045608.2015.1052338.
- Ohri-Vachaspati Punam, Acciai Francesco, and DeWeese Robin S.. 2021. "SNAP Participation among Low-Income US Households Stays Stagnant While Food Insecurity Escalates in the Months Following the COVID-19 Pandemic." *Preventive Medicine Reports* 24:101555. doi: 10.1016/j.pmedr.2021.101555.
- Peters David J. 2020. "Community Susceptibility and Resiliency to COVID-19 Across the Rural-Urban Continuum in the United States." *The Journal of Rural Health* 36(3):446–56. doi: 10.1111/jrh.12477. [PubMed: 32543751]
- Pilkaukas Natasha V., Garfinkel Irwin, and McLanahan Sara S.. 2014. "The Prevalence and Economic Value of Doubling Up." *Demography* 51(5):1667–76. doi: 10.1007/s13524-014-0327-4. [PubMed: 25165015]
- Reid Megan. 2013. "Disasters and Social Inequalities." *Sociology Compass* 7(11):984–97. doi: 10.1111/soc4.12080.
- Richard Molly K., Dworkin Julie, Katherine Grace Rule Suniya Farooqui, Glendening Zachary, and Carlson Sam. 2022. "Quantifying Doubled-Up Homelessness: Presenting a New Measure Using US Census Microdata." *Housing Policy Debate* 1–22.
- Rocco Philip, Béland Daniel, and Waddan Alex. 2020. "Stuck in Neutral? Federalism, Policy Instruments, and Counter-Cyclical Responses to COVID-19 in the United States." *Policy and Society* 39(3):458–77. doi: 10.1080/14494035.2020.1783793. [PubMed: 35039731]
- Sadri Arif Mohaimin, Ukkusuri Satish V., Lee Seungyoon, Clawson Rosalee, Aldrich Daniel, Nelson Megan Sapp, Seipel Justin, and Kelly Daniel. 2018. "The Role of Social Capital, Personal Networks, and Emergency Responders in Post-Disaster Recovery and Resilience: A Study of Rural Communities in Indiana." *Natural Hazards* 90(3):1377–1406. doi: 10.1007/s11069-017-3103-0.
- Salamon Lester M. 1994. "The Rise of the Nonprofit Sector." *Foreign Affairs* 73(4):109–22. doi: 10.2307/20046747.
- Stuber Jennifer, and Schlesinger Mark. 2006. "Sources of Stigma for Means-Tested Government Programs." *Social Science & Medicine* 63(4):933–45. doi: 10.1016/j.socscimed.2006.01.012. [PubMed: 16542766]
- Tach Laura, and Edin Kathryn. 2017. "The Social Safety Net After Welfare Reform: Recent Developments and Consequences for Household Dynamics." *Annual Review of Sociology* 43:541–61.
- Thiede Brian, Kim Hyojung, and Valasik Matthew. 2018. "The Spatial Concentration of America's Rural Poor Population: A Postrecession Update." *Rural Sociology* 83(1):109–44. doi: 10.1111/ruso.12166.
- Tickamyer Ann R., and Duncan Cynthia M.. 1990. "Poverty and Opportunity Structure in Rural America." *Annual Review of Sociology* 16(1):67–86. doi: 10.1146/annurev.so.16.080190.000435.
- Tobin-Gurley Jennifer, Peerk Lori, and Loomis Jennifer. 2010. "Displaced Single Mothers in the Aftermath of Hurricane Katrina: Resource Needs and Resource Acquisition." *International Journal of Mass Emergencies and Disasters* 28.

- U.S. Census Bureau. 2019. Current Population Survey Design and Methodology Technical Paper 77.
- U.S. Census Bureau. n.d. 2018: ACS 5-Year Estimates. American Community Survey.
- U.S. Census Bureau and Bureau of Labor Statistics. 2021. Current Population Survey 2021 Annual Social and Economic (ASEC) Supplement. Washington, D.C.
- USDA Economic Research Service. 2020. "Rural-Urban Continuum Codes." Retrieved January 30, 2022 (<https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>).
- Vandervoort Debra. 2000. "Social Isolation and Gender." *Current Psychology* 19(3):229–36. doi: 10.1007/s12144-000-1017-5.
- Vargas Edward D., and Sanchez Gabriel R.. 2020. "COVID-19 Is Having a Devastating Impact on the Economic Well-Being of Latino Families." *Journal of Economics, Race, and Policy* 3(4):262–69. doi: 10.1007/s41996-020-00071-0. [PubMed: 35300202]
- Weber Bruce, and Miller Kathleen. 2017. "Poverty in Rural America Then and Now." Pp. 28–64 in *Rural Poverty in the United States*. New York, NY: Columbia University Press.
- Wiemers Emily E. 2014. "The Effect of Unemployment on Household Composition and Doubling Up." *Demography*. doi: 10.1007/s13524-014-0347-0.
- Wu Viviana Chiu-Sik. 2019. "The Geography and Disparities of Community Philanthropy: A Community Assessment Model of Needs, Resources, and Ecological Environment." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*. doi: 10.1007/s11266-019-00180-x.
- Young Maria-Elena De Trinidad, Fabiola Perez-Lua Hannah Sarnoff, Plancarte Vivianna, Goldman-Mellor Sidra, and Diaz Payán Denise. 2022. "Working around Safety Net Exclusions during the COVID-19 Pandemic: A Qualitative Study of Rural Latinx Immigrants." *Social Science & Medicine* 311:115352. doi: 10.1016/j.socscimed.2022.115352.
- Zahnaw Renee, Wickes Rebecca, Taylor Mel, and Corcoran Jonathan. 2019. "Community Social Capital and Individual Functioning in the Post-Disaster Context." *Disasters* 43(2):261–88. doi: 10.1111/disa.12317. [PubMed: 30431169]

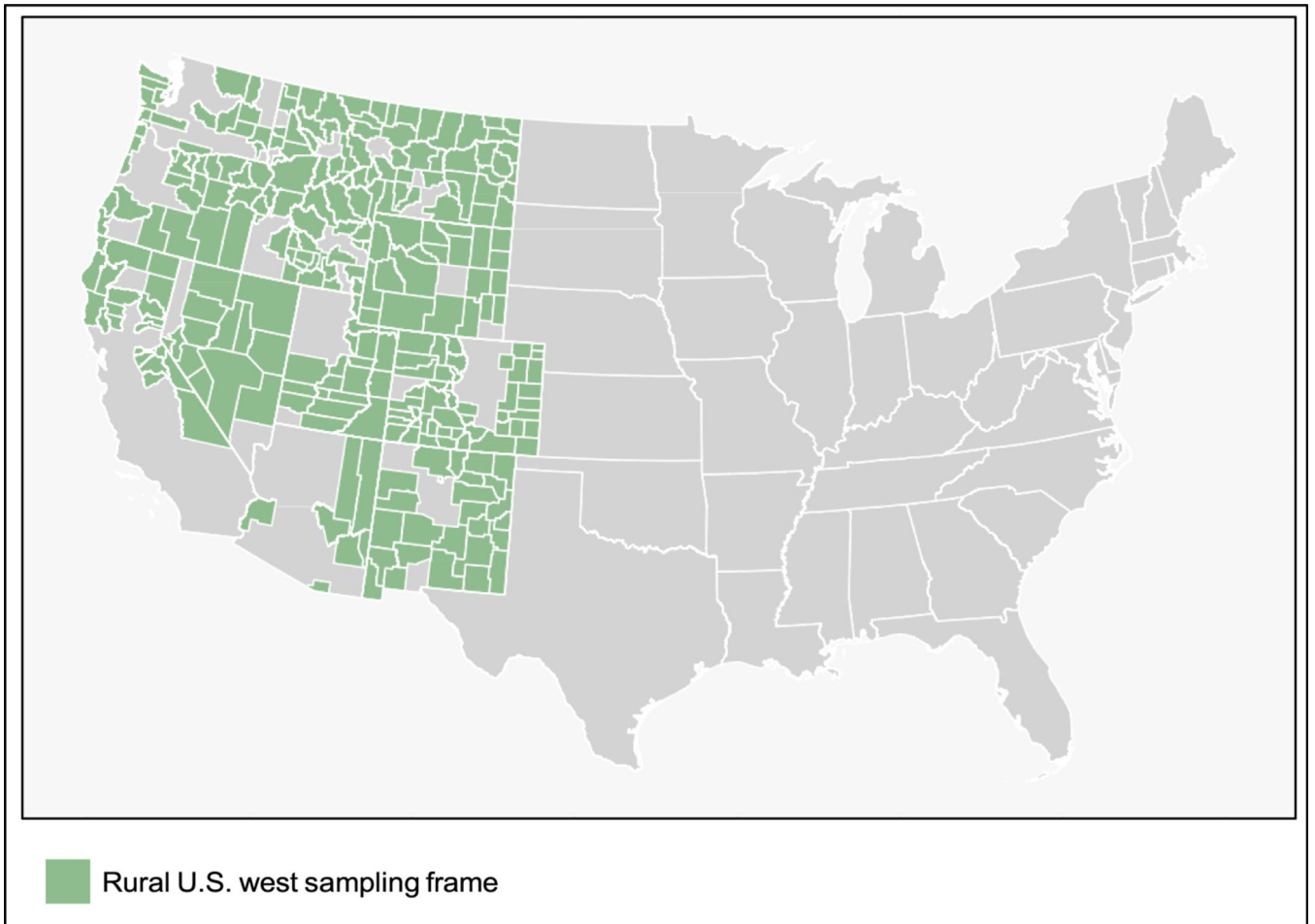


Figure 1:
Sampling frame of non-metropolitan western counties.
Notes: Counties sampled in the novel survey shown in green. Counties were sampled from the following states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Table 1:

Use of informal social support and formal government programs

Type of support	Survey estimate	CPS-ASEC estimate
Informal social support		
Participated in any informal support	52.3, CI [48.1, 56.4]	-
Food bank	6.0, CI [3.8, 8.2]	-
Community- or faith-based organization	3.2, CI [1.6, 4.8]	-
Received informal financial assistance	9.4, CI [6.7, 12.2]	-
Gave informal financial assistance	38.0, CI [33.9, 42.1]	-
Doubled up	19.3, CI [15.9, 22.7]	-
Formal government programs		
Participated in any formal government safety net	36.1, CI [32.2, 40.0]	58.6, CI [56.2, 61.0]
Medicaid	10.7, CI [7.9, 13.5]	24.8, CI [22.7, 26.9]
Social Security	19.0, CI [16.2, 21.8]	28.5, CI [26.2, 30.7]
SNAP	6.7, CI [4.2, 9.3]	15.8, CI [14.0, 17.7]
Unemployment benefits	12.3, CI [9.4, 15.2]	10.1, CI [8.6, 11.7]

Notes: Survey estimates taken from the Rural West Survey fielded from June 25th to July 22nd of 2020. CPS-ASEC estimates taken from the 2021 Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC). The 2021 CPS-ASEC corresponds to the calendar year of 2020.

Table 2:

Informal social support participation by self-reported Covid-19 impacts

A. Overall Covid-19 Impact

	Any Informal	Food Bank	Organization	Network Receive	Network Give	Double Up
Intercept (No Impact)	0.44 ^{***} (0.04)	0.06 ^{**} (0.02)	0.03 [*] (0.02)	0.07 [*] (0.03)	0.27 ^{***} (0.03)	0.22 ^{***} (0.03)
Negative Overall Impact	0.13 [*] (0.05)	-0.00 (0.03)	-0.00 (0.02)	0.05 (0.03)	0.16 ^{***} (0.05)	-0.03 (0.04)
Positive Overall Impact	0.06 (0.06)	0.01 (0.03)	0.01 (0.03)	0.00 (0.04)	0.14 [*] (0.06)	-0.04 (0.05)
Num. obs.	1009	1009	1009	1009	1009	1009

B. Financial Impact

	Any Informal	Food Bank	Organization	Network Receive	Network Give	Double Up
Intercept (No Impact)	0.45 ^{***} (0.03)	0.03 ^{**} (0.01)	0.02 [*] (0.01)	0.05 ^{**} (0.02)	0.33 ^{***} (0.03)	0.20 ^{***} (0.03)
Negative Financial Impact	0.16 ^{***} (0.05)	0.06 ^{**} (0.02)	0.05 [*] (0.02)	0.12 ^{***} (0.03)	0.10 [*] (0.05)	-0.00 (0.04)
Positive Financial Impact	0.07 (0.06)	0.05 (0.04)	-0.01 (0.01)	0.03 (0.04)	0.09 (0.06)	-0.03 (0.05)
Num. obs.	1009	1009	1009	1009	1009	1009

C. Job Loss

	Any Informal	Food Bank	Organization	Network Receive	Network Give	Double Up
Intercept (No Job Loss)	0.50 ^{***} (0.02)	0.06 ^{***} (0.01)	0.02 ^{***} (0.01)	0.06 ^{***} (0.01)	0.39 ^{***} (0.02)	0.19 ^{***} (0.02)
Job Loss	0.14 [*] (0.06)	0.02 (0.04)	0.08 (0.04)	0.21 ^{**} (0.06)	-0.04 (0.06)	0.03 (0.05)
Num. obs.	1009	1009	1009	1009	1009	1009

 $p < 0.001$

**
 $p < 0.01$

*
 $p < 0.05$

Table 3:

Informal social support participation across demographic groups

	Any Informal	Food Bank	Organization	Network Receive	Network Give	Double Up
Intercept	0.46*** (0.07)	0.02 (0.03)	0.05 (0.03)	0.17*** (0.05)	0.34*** (0.07)	0.14* (0.05)
Sex [Ref. = Male]						
Female	0.08 (0.04)	0.05* (0.02)	0.01 (0.02)	0.00 (0.03)	0.03 (0.04)	0.08* (0.04)
Other or No Response (Sex)	0.24 (0.19)	0.13 (0.14)	0.10 (0.14)	-0.03 (0.10)	0.33 (0.20)	-0.00 (0.16)
Ethnicity [Ref. = Not Latino/a]						
Latino/a	0.23*** (0.07)	0.03 (0.04)	-0.03 (0.02)	0.02 (0.05)	0.18* (0.08)	0.13 (0.07)
No Response (Ethnicity)	0.03 (0.12)	0.03 (0.05)	0.04 (0.05)	0.02 (0.05)	0.03 (0.11)	0.01 (0.07)
Education [Ref. = Bachelors or Associates]						
Less than High School	0.16 (0.13)	0.24 (0.15)	0.03 (0.06)	0.17 (0.14)	0.03 (0.16)	0.08 (0.14)
High School or GED	-0.03 (0.06)	0.01 (0.03)	-0.03* (0.01)	0.03 (0.04)	-0.09 (0.05)	-0.01 (0.05)
Some College	-0.01 (0.05)	0.00 (0.02)	0.01 (0.02)	0.02 (0.03)	-0.01 (0.05)	0.05 (0.04)
Graduate or Professional Degree	0.07 (0.05)	-0.02 (0.02)	0.02 (0.02)	0.02 (0.03)	0.05 (0.05)	0.05 (0.04)
No Response (Education)	-0.32 (0.25)	0.02 (0.19)	-0.14 (0.11)	-0.04 (0.13)	-0.19 (0.26)	0.07 (0.18)
Age [Ref. = 18-34]						
35-49	0.01 (0.07)	0.02 (0.04)	0.01 (0.03)	-0.10 (0.06)	0.05 (0.07)	-0.02 (0.06)
50-64	0.02	-0.02	-0.04	-0.14*	0.04	-0.03

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

	Any Informal	Food Bank	Organization	Network Receive	Network Give	Double Up
65+	(0.07) -0.11	(0.04) -0.02	(0.03) -0.04	(0.05) -0.17***	(0.07) -0.08	(0.06) -0.08
No Response (Age)	(0.07) -0.02	(0.04) -0.04	(0.03) -0.04	(0.05) -0.04	(0.06) -0.11	(0.06) -0.08
Num. obs.	1009	1009	1009	1009	1009	1009

 $p < 0.001$

**
 $p < 0.01$

*
 $p < 0.05$