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The impact of nutrition assistance programs on food insecurity among older adults

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Abstract

Using administrative data from Georgia covering January 2018-August 2020, we estimated the effect of services provided through the Older Americans Act (OAA) and the Supplemental Nutrition Assistance Program (SNAP) on food insecurity among older Georgians. Our sample included those who received services prior to and during the COVID-19 pandemic. For the entire sample period (i.e., pre-COVID and during COVID), we found home-delivered meals and other OAA services reduced food insecurity by roughly 3% and 4%, respectively. The effect of SNAP on reducing food insecurity significantly increased from 2.1% (pre-COVID) to 4.7% (during COVID). While we find no effect of congregate meals on food insecurity in the pre-COVID period, the loss of "traditional" congregate meals in a social setting during COVID increased food insecurity by 7%.

Executive Summary

Objectives: Food insecurity—defined as a lack of access to food necessary to lead an active and healthy lifestyle—is an urgent public health concern due to its linkage with a variety of adverse health outcomes. Two prominent federally funded public assistance programs exist to alleviate food insecurity and associated health outcomes: the Supplemental Nutrition Assistance Program (SNAP) and the Older Americans Act (OAA) Title III programs. Given a rapidly aging population, the number of food insecure older Americans is projected to significantly increase by 2030. Thus, the implications for potential strain on food and nutrition assistance for seniors, in addition to health care programs and public health policies are significant. Therefore, it is more critical than ever to better understand the current nature of food insecurity and to what extent federally funded nutrition assistance programs alone or in combination would reduce food insecurity in older Americans.

Using administrative data from Georgia, this research examines: 1) temporal usage patterns of assistance programs and food insecurity among older Georgians and 2) the effect of nutrition assistance program participation (SNAP, OAA, and dual participation) on food insecurity in older Georgians. For both objectives, we focus on differences prior to COVID (January 2018 to February 2020) and during COVID (March 2020 to August 2020).

Methods: This research used a comprehensive statewide longitudinal dataset from Georgia with information on food insecurity, coupled with administrative data on SNAP and OAA Title III programs (i.e., OAA Nutrition Programs and Home and Community-based Services (HCBS)). The state-level data were established through ongoing and expanded collaborations among the University of Georgia and state government offices (i.e., Georgia Division of Aging Services and Georgia Division of Family and Children Services). The datasets include Georgia State Aging Administrative Database System (GA Wellsky™ Data, January 1, 2018 to August 31, 2020) and Georgia SNAP administrative data (January 1, 2018 to August 31, 2020). The analytic sample includes older Georgians in the statewide OAA and SNAP administrative data who completed at least one food insecurity assessment and utilized at least one OAA Nutrition Program or other OAA services during each of the three study years (N=5,755).
We first document usage patterns of major public assistance programs in nutrition and aging. We then estimate the impact of program participation (both single and dual enrollment) on food insecurity in low-income older Georgians using panel methods. We use service/program usage from the month preceding the food insecurity assessment for two reasons: (1) the assessment asks about the previous 30 days, and (2) the assessment is many times administered concurrently with first-time OAA service usage. Thus, the previous month's service usage more accurately coincides with experiences of food hardships.

Findings: First, we find food insecurity rates for our sample consistently fell from 17.0% (2018) to 14.5% (2019) to 11.7% (2020). Second, in terms of program effects, we find HDM and other OAA services worked to decrease food insecurity rates by roughly three and four percentage points, respectively, regardless of the time period (i.e., pre-COVID and during COVID).

The effect of CM on food insecurity, on the other hand, had significantly different effects prior to, and during COVID, most likely due to the COVID-induced changes in program delivery. In

particular, we find no effect of CM on food insecurity in the pre-COVID period. However, when CM participants lost access to their "traditional" congregate meals in a social setting, we find food insecurity rates increased by nearly seven percentage points. During COVID, CM participants received home-delivered frozen and/or shelf-stable meals every 1-2 weeks, while other CM sites offered grab-and-go meals for pick up.

In terms of SNAP, we find the effect on reducing food insecurity more than doubled during the pandemic, increasing from a 2.1 to 4.7 percentage point reduction in food insecurity. During COVID, SNAP benefits were increased. This may be due in part to the quick deploy of SNAP emergency resources and new flexibilities during the pandemic including SNAP emergency allotment approved on March 23, 2020 in Georgia bringing maximum benefits to SNAP households not already receiving maximum benefits and adjustments to interview requirements and certification periods, and reporting requirements. Although the usage of online SNAP purchasing could be a contributing factor, it is unknown to what extent seniors took up this option.

Discussion: The approaches explored in this study align with the Evidence-Based Policymaking Commission Act of 2016 with the goal of exploring ways to utilize program administration data for policy research, including program evaluation. In particular, we demonstrated the strength of ongoing programmatic data collection efforts with regard to food insecurity, as linked with administrative data. Further, the linkage to multiple administrative data, in this case OAA service usage with SNAP data, has proved quite useful. Obviously, no one could foresee the pandemic, yet the resiliency of program operations and data collection effort proved invaluable. In order to support future research using this approach, it is critical to establish standardized procedures guiding interagency data sharing and linkage processes for researchers and the agencies, as well as the guidance surrounding the privacy and confidentiality in the use of individual-level data.

Second, the findings of this study should help begin to fill the gap in the literature on (plausibly) causal relationships between nutrition assistance programs and food insecurity in low-income older adults. In short, we find all assistance programs reduce food insecurity in some capacity, especially with regards to the amplification during the COVID-19 pandemic.

Third, the results of this study should inform evidence-based practices, programs, and guidelines to address food insecurity and the related burden among older populations. Our findings shed light on promising strategies to identify and prioritize the older population's food assistance needs before and during the pandemic, link appropriate services to meet their needs within the bounds of the limited resources and evaluate program outcomes. Moreover, our approach suggests models to develop an integrated collaboration among the federal nutrition assistance programs and aging services network, such as our approach linking administrative datasets from two state agencies responsible for providing food assistance services to low-income older adults.

Finally, and perhaps most importantly, it should be recognized that the OAA is underfunded. The real dollar value of funding has been decreasing for many years. Moreover, half of all local service providers have waiting lists for home-delivered meals, and one-quarter have waitlists for congregate meals. The 80-plus percentage increase in OAA funding during the COVID-19 pandemic appears to have worked, given our findings. Policymakers should strongly consider maintaining a robust funding schedule for OAA in the years to come.

Implications: The lessons and experiences from our administrative dataset development process have the potential to suggest robust standards and best practices for linking and using administrative data for food assistance program planning, policy decision making, and collective impact evaluation, and develop a roadmap to guide other states in establishing similar data. The findings from this project can inform program administrators and policymakers regarding the effectiveness of food assistance and enhance the delivery of public assistance programs and other services targeted to meet the unique needs and demands of older adults.

Introduction

Food insecurity is an urgent public health concern due to its linkage to poorer nutrition, health, and well-being. For financially constrained older adults, food insecurity is exasperated by poor health and functional limitations (Brewer et al. 2010, Lee, Fischer, and Johnson 2010, Lee and Frongillo 2001a), which in turn contributes to various nutritional and non-nutritional complications (Lee and Frongillo 2001b, Ziliak, Gundersen, and Haist 2008, Bhargava and Lee 2016, 2017, Bhargava et al. 2012, Sattler and Lee 2013, Sattler, Lee, and Bhargava 2014, Strickhouser, Wright, and Donley 2015, Ziliak and Gundersen 2013). Given a rapid aging population (Vespa, Armstrong, and Medina, 2018), the number of food insecure older Americans is projected to significantly increase by 2030. Furthermore, the COVID-19 pandemic has presented unprecedented detrimental effects on the health and nutrition of vulnerable older Americans (Armitage and Nellums, 2020). Therefore, understanding to what extent federally funded nutrition assistance programs reduce food insecurity in older Americans, both prior to and during COVID-19, is of first-order policy priority.

This paper explores the extent to which two federally funded nutrition assistance programs—the Supplemental Nutrition Assistance Program (SNAP) and the Older Americans Act (OAA) Nutrition Programs—reduce food insecurity, either alone or in combination, within an older American population. We further focus on two time periods: pre-COVID (January 2018 to February 2020) versus during COVID (March 2020 up to August 31, 2020). While SNAP is the nation's largest food assistance program, our main focus is on OAA. As described in detail in the next section, the OAA Nutrition Programs provide nutrition assistance to older individuals via Congregate Meals (CM), Home-delivered Meals (HDM), and other OAA services. The OAA Nutrition Programs are the second largest nutrition assistance program available to older

Americans, providing $906 million in fiscal year 2019 (Colello and Napili 2021). Due to a series of congressional COVID-19 relief packages, funding for the OAA Nutrition Program increased by 83% to $1.66 billion for fiscal year 2020, which was further increased to $1.87 billion in 2021 (Colello and Napili 2021).

We use two administrative datasets from the state of Georgia, covering January 2018 to August 2020. The main dataset comes from the Georgia Division of Aging Services (GA DAS), which contains information on OAA Nutrition Programs and other OAA services usage. Since 2011, individuals receiving OAA Nutrition Programs in Georgia have been monitored annually for food insecurity using a 6-item validated 30-day food insecurity questionnaire (Lee et al., 2011), forming the basis of our outcome. The collection of these data began well before the COVID-19 pandemic (Lee et al. 2011), and data collection continued as the pandemic unfolded, yielding a consistent measure over the entire sample period.

The second dataset contains administrative data on monthly SNAP participation from the Georgia Division of Family and Children Services (GA DFCS). These SNAP data are merged with OAA service usage and food insecurity assessments from GA DAS. Our analytic sample consists of all older Georgians who received OAA services over 2018-2020, regardless of SNAP participation. Among those who received OAA services, SNAP participation and food security status is known in each of the three years.

Our identification strategy leverages the longitudinal nature of the data. Although not perfect, we argue estimates are conservative for two reasons. First, the individual fixed effects attenuate program effects by orders of magnitude, in some cases, flipping the sign. Thus, the fixed effects appear to control for a substantial portion of time-invariant omitted variable bias. Second,

in the presence of time-varying omitted variable bias, estimates are likely biased upwards.[1] In other words, for the effects that we do find to reduce food insecurity, they are likely to be attenuated towards zero, and thus likely conservative.

The main findings are as follows: first, we find food insecurity rates for our sample consistently fell from 17.0% (2018) to 14.5% (2019) to 11.7% (2020). Second, in terms of program effects, we find HDM and other OAA services worked to decrease food insecurity rates by roughly three and four percentage points, respectively, regardless of the time period (i.e., pre-COVID and during COVID).

The effect of CM on food insecurity, on the other hand, had significantly different effects prior to, and during COVID, most likely due to the COVID-induced changes in program delivery. In particular, we find no effect of CM on food insecurity in the pre-COVID period. However, when CM participants lost access to their "traditional" congregate meals in a social setting, we find food insecurity rates increased by nearly seven percentage points. During COVID, CM participants received home-delivered frozen and/or shelf-stable meals every 1-2 weeks, while other CM sites offered grab-and-go meals for pick up (GAO, 2021).

In terms of SNAP, we find the effect on reducing food insecurity more than doubled during the pandemic, increasing from a 2.1 to 4.7 percentage point reduction in food insecurity. During COVID, SNAP benefits were increased. Although the usage of online SNAP purchasing could be a contributing factor, it is unknown to what extent seniors took up this option (GAO, 2021).

[1] For example, we should expect time-varying adverse shocks, if observed, to have a positive coefficient (i.e., increasing food insecurity). Moreover, this shock should be positively correlated with nutrition assistance take-up. Together, this implies an upward bias on nutrition services when such shocks are omitted (Wooldridge, 2010, p 66-67).

The Older Americans Act (OAA): Institutional Background

The Older Americans Act (OAA) provides a host of services for individuals aged 60 years or older. The Act establishes the Administration on Aging (AoA) as the federal agency that coordinates OAA services. The AoA agency became part of the Administration of Community Living (ACL) in 2012. The ACL is charged with overseeing State Units on Aging (SUAs) that administer OAA funding. Each state's SUA designates Area Agencies on Aging (AAAs), who oversee the distribution of services, either directly, or through Local Service Providers (LSPs).

OAA Benefits

Title III of the Act is the focus of this paper, as it establishes funding for HCBS. HCBS provide alternative long-term care for vulnerable older adults in non-institutional settings to help them maintain independence, delay disease and disability, and remain in their homes and communities. HCBS can be categorized into 4 areas: nutrition and wellness (e.g., CM, HDM, chronic disease self-management), in-home services (e.g., homemaker services, respite), caregiver programs (e.g., case management, adult daycare), and other services (e.g., transportation).

Title III services are available to any individual over 60, but local providers typically target those in greatest economic and/or social need. Although means testing is prohibited by law, SUAs are required to have a prioritization policy, effectively leading to waitlists. As such, waitlists are not uncommon: in 2014, 51% of local service providers (LSPs) had a waitlist for HDM and 24% for CM (Mabli et al 2015).

OAA Federal Funding

Although nutrition services under the OAA comprise the second largest form of nutrition assistance for older individuals, it is underfunded, as indicated by the size of waitlists. As shown in figure 1, the nominal value of Title III funding has been relatively flat since 2014, implying a decreasing real value of funding. COVID-19 relief legislation increased the OAA Nutrition Programs funding by over 80% in 2020: an additional $80 million for CM and $640 million for HDM. In the most current round of COVID-19 relief legislation, which is distributed in 2021, additional CM funding was nearly quadrupled to $300 million, while additional funding for HDM remained steady at $618 million (figure 1).

OAA Service Delivery During COVID

OAA service delivery was modified or temporarily suspended to minimize COVID-19 exposure risk among older adults, volunteers, and providers. Several CM sites transitioned to "grab and go" or home delivery of frozen and shelf-stable meals every 1-2 weeks (GAO, 2021). Many HDM experienced adjusted meal preparation and distribution methods, as well as expanded delivery options to meet the increased demands for meals. Numerous in-home and caregiver support services were reduced or temporarily stopped at the beginning of the pandemic (GAO, 2021).

The Supplemental Nutrition Assistance Program (SNAP)

The Supplemental Nutrition Assistance Program (SNAP, formerly Food Stamps), the largest of the federal nutrition assistance programs, intends to alleviate hunger, improve nutrition, and provide monthly benefits to low-income families and individuals. Unlike other food and nutrition

assistance programs that target specific groups, SNAP is available to all households that meet the program's resource and income tests which are offset by select deductions to get SNAP benefits. SNAP served about 35.7 million persons with an average monthly benefit of $129.83 in fiscal year 2019 (Toossi et al. 2021). SNAP participation among older adults has remained a little bit over one-third of eligible older adults, the lowest rate among all demographic groups. In response to the COVID-19 pandemic, several program changes were made to meet the rising food demands and support social distancing, such as emergency allotments, online purchasing, and greater administrative flexibilities. During the fiscal year 2020, SNAP served 11.7% more participants (39.9 million) and 19.% higher average monthly benefits ($154.99) (Toossi et al. 2021).

Previous Work on Food Insecurity among Older Americans

Previous work on food insecurity among older individuals has primarily focused on trends and associations (Ziliak and Gundersen 2019). The deficiency of prior work on the effect of food assistance on food insecurity among older Americans, particularly in the presence of dual-program participation, may be due in part to the lack of existing state and nationally representative datasets and/or established procedures and infrastructure needed to collect such data in vulnerable older populations (Lee 2013). Perhaps more importantly, previous work has employed less-than-convincing identification strategies when it comes to understanding determinants of food insecurity for older individuals (Gundersen and Ziliak 2015). Campbell et al. (2015) also concluded that most studies evaluating the effectiveness of HDM on various outcomes lack rigor, have small samples, and/or are limited to particular settings/populations (Campbell et al. 2015).

University of Georgia and GA DAS have tested the feasiblity of several innovative research methods to improve the OAA Nutrition Program evaluation as part of adminsitrative processes.

These efforts were driven by the poorer food security and nutritional health status of older Georgians. The university-government team proved the ability of the nationally validated food insecurity measure to assess need status and benefits of OAA Nutrition Programs in older adults, established a statewide longitudinal food insecurity and OAA servive use dataset, and showed signficant contribution of OAA Nutrition Program to improve food security in older Georgians (Lee, Fisher, and Johnson 2010, Lee et al. 2011; Lee, Johnson, and Brown 2011, Lee, Shannon, and Brown 2015). The nation's primary data source for tracking food insecurity is the Current Population Survey-Food Security Supplement (CPS-FSS). These data are fielded annually (every December) and show an overall increasing trend of food insecurity rates among older Americans (Ziliak and Gundersen 2019). As the COVID-19 pandemic unfolded, researchers scrambled to collect real time data on food insecurity and the usage of food and nutrition assistance programs. The most prominent example is the Census Bureau's Household Pulse Survey (PULSE), which is designed to provide real time information on pandemic-induced socioeconomic and health outcomes. PULSE is not without its limitations: it assesses food sufficiency, rather than food insecurity. Food insufficiency is assessed using a single question asking if a household generally has enough to eat with a 7-day reference period and indicates a more severe condition than overall food insecurity (USDA Economic Research Services 2021). PULSE also relies on the receipt of charitable foods, which may not be specific to the OAA Nutrition Programs. Moreover, the data collection process began after the pandemic started, making pre-trend analyses difficult.

Nevertheless, we do know that food hardship among older individuals increased during the pandemic. Using PULSE, Ziliak (2021) finds *food insufficiency* among seniors rose from 2.8% in December 2019 to 4.9% in July 2020. Similarly, Ashbrook (2020) reports that Diane Schanzenbach estimates an increase of *food insecurity* among older Americans from 8.5% in 2018

to 13.5% during April-June 2020. Despite the differences in how food insufficiency and food insecurity are defined, both indicators show a 60-75% increase in prevalence. In terms of OAA Nutrition Programs, in May 2020, Meals on Wheels America reported serving 22% more seniors as compared to pre-COVID-19, corresponding to an increase of 56% more meals per week (Mazzella 2020). However, the 2020 U.S. Household Food Security Report shows a slight reduction in overall food insecurity in households with elderly (6.9% vs 7.2% in 2019) (Coleman-Jensen et al. 2021).

Several studies show that SNAP alleviates food insecurity and improves health outcomes among program participants (Ratcliffe, McKernan, and Zhang 2011, Yen et al. 2008, Mabli and Ohls 2015, Gregory and Deb 2015, Berkowitz et al. 2017, Sonik 2016). However, there exists a dearth of knowledge on the impact of SNAP among elderly individuals. While several studies have examined the relationship between SNAP and health care utilization and expenditures among older adults (Srinivasan and Pooler 2018, Nicholas 2011, Samuel et al. 2018, Szanton et al. 2017), none have focused explicitly on causal impacts of SNAP on food insecurity, especially in the presence of other nutrition assistance programs specifically tailored to older individuals.

Research Methods

Data

We utilize two administrative datasets from GA DAS and GA DCFS (table 1). As part of standard program administration, GA DAS collects information of OAA program participants on their sociodemographic and economic characteristics, the type and duration of the OAA Nutrition Programs and other OAA use, and food insecurity. The GA DFCS SNAP administrative data consist of monthly information on SNAP case status (e.g., approved, denied, closed, or

withdrawn), participation status (e.g., eligible adult, eligible child, ineligible adult, ineligible child, excluded adult, excluded child, or Intentional Program Violation (IPV) disqualified in a given month), and benefit amounts. SNAP administration data are not subject to underreporting typically observed in self-reported SNAP participation data in most national surveys (Meyer, Mok, and Sullivan 2015).

Individual level linking of the state administrative data from GA DAS and GA DFCS required three legal and technical considerations including the requirement to obtain written waiver of federal law 45 C.F.R § 1321.51[2], to establish additional interagency Data Use or other Legal Agreements (NO. 42700-040-0000098647), and to add additional identifiable subject IDs (figure 1). The evolving situation with coronavirus delayed the acquisition of the written waiver from ACL and the following steps (figure 2).

GA DAS and GA DFCS coordinated the abstraction of older Georgians in their statewide aging and SNAP administrative datasets. GA DAS identified any participants included in the state aging service data management system between January 2012-August 2020 and sent their identifiers, including Social Security number, date of birth, last name, zip code, and an assigned study ID to GA DFCS (figure 3). GA DFCS identified 14,557 aging services participants matched in the SNAP administrative data between January 2018-August 2020.

The resulting statewide longitudinal food insecurity, OAA services use, and SNAP participation data provide unprecedented documentation and evidence on the prevalence and trends in food insecurity in a state with higher-than-average prevalence of food insecurity, poverty and adverse health outcomes and examine the effect of nutrition assistance programs on food

[2] Older Americans Act; 45 C.F.R § 1321.51- Confidentiality and Disclosure of Information (2007)

insecurity. The Institutional Review Boards of the University of Georgia (#PROJECT00000866) and the Georgia Department of Public Health approved this project (#091203).

Measures

Food Insecurity Measurements

In partnership with GA DAS and USDA Economic Research Services, we examined the feasibility and validity of the nationally validated food insecurity measure to assess the needs status and benefits of OAA nutrition services in older Georgians (Lee, Johnson, and Brown, 2011, Lee et al. 2011). Since 2011, GA DAS has been collecting food insecurity data using the validated 6-item 30-day food insecurity questionnaire as part of the standard application process and annual follow-up assessment.[3] Questions pertained to food hardships experienced in the last 30 days. Based on the sum of affirmative responses to the food insecurity questionnaire, we calculated a food insecurity summary score (score of 0–6) and used this score to classify individuals as either food secure (score 0-1) or food insecure (score 2-6). Because a food security assessment is conducted whenever an older Georgian receives a new nutrition service, data are characterized by unbalanced and unequally spaced repeated measures of food security status. The number and timing of food insecurity assessments is contingent on the type and number of services the participants apply for and receive during the year.

OAA Services and SNAP Participation

[3] Lee et al. (2011) demonstrated the validity of the six-item HHFSM older Georgians in need of OAANP services. Over 2011-2017, all individuals *seeking* services were administered the food security module, but this practice stopped in 2018.

We derived detailed measures of aging services and SNAP participation. OAA services available for older Georgians is described elsewhere (Lee, Shannon, and Brown 2015). Based on the use of OAA Nutrition Programs, other OAA service, and SNAP within each year as well as each month, we categorized the aging services participants into four non-mutually exclusive program use groups: 1) CM, 2) HDM, 3) other OAA (i.e., non-OAA Nutrition Program services)[4], and 4) SNAP.

Sociodemographic and Economic Characteristics

GA DAS collects data on selected sociodemographic and economic characteristics of OAA program participants. Age was measured as a continuous variable and then categorized into four groups: ≤60, 60-74, 75-84, and ≥85 years based on the previous study on the OAA service usage pattern in older Georgians (Lee et al. 2015). Race was categorized into four groups: Black, White, other, and did not disclose or missing. Household income was dichotomized as: 1) above Federal Poverty Level (FPL), and 2) at or below FPL. Participants were classified into one of four groups based on their marital status: married, widowed, others including divorced, separated, never married, and those who did not disclose or missing. Living arrangement of the participants was dichotomized into 1) living with someone or 2) living alone.

Study Sample and Summary Statistics

The analytic sample includes older adults in the statewide OAA and SNAP administrative data who completed at least one food insecurity assessment and utilized at least one OAA Nutrition Program or other OAA services during each study year (N=5,755). The original food insecurity

[4] Other HCBS services (i.e., non-nutritional OAA services) include health promotion, in-home services, caregiver programs, and transportation services.

assessment data consisted of 39,314 aging services participants with at least one assessment between January 1, 2018 and August 31, 2020.[5]

We sought a panel of individuals, such that we observe within-person changes in program usage and food insecurity over multiple years including 2020. A small percentage of individuals had multiple assessments in a single year (amounting to 4.9% in 2018, 4.7% in 2019, and 1.4% in 2020), and in these cases we use the first assessment. Next, we exclude 28,360 individuals who had either a single year of program use or only one food insecurity assessment, leaving 10,954 candidates for our panel data. Of these, 5,755 participants had food insecurity assessments and program usage in all three years. Our main results utilize the balanced three-year panel (N=5,755) (table 2).

As compared to all Americans 60 years and older, a larger share of older Georgian OAA participants were 75 years and older (48.7% vs. 30.3%), female (72.8% vs. 54.6%), minority (56.9% vs. 26.5%), and living under poverty (42.7% vs. 10.1 %) (Administration for Community Living AGing, Independence, and Disability Program Data Portal 2021). Our analytic sample shows significantly different sociodemographic characteristics from the excluded sample at baseline in 2018 (table 3). For example, our study sample is ~4 years older and more likely to be female, non-white, living alone, widowed. and below the federal poverty level.

In terms of differences by OAA program usage within our study sample, characteristics at baseline (2018) differ significantly across nearly all aspects (table 4). This is expected given that the mode of service delivery (e.g., HDM versus CM) is necessarily related to a participant's needs (Lee et al 2015). For example, those receiving HDM are more likely to be non-white, living alone, and not married.

[5] These 39,314 individuals represent 1.9% of Georgians 60 years and older, or 15.8% of Georgians 60 years and older living under poverty.

We also see significant differences in characteristics by SNAP participation (table 4): SNAP participants are more likely to be black (62.4% versus 41.9%), living alone (65.8% versus 39.7%), unmarried, and below the poverty line (68.7% versus 38.3%).

Program Usage and Food Insecurity Rates prior to and during COVID

As shown in panel A of table 5, program participation significantly increased for all services from 2018 to 2019. Panel B of table 5 shows food insecurity rates for our sample fell from 17.0% (2018) to 14.5% (2019) to 11.7% (2020). The general trend of declining food insecurity also holds for the subgroups: HDM, and those who received other OAA (non-OAA Nutrition Programs) services. Food insecurity rates for those receiving SNAP also declined substantially from 27.5% in 2018 to 18.8% in 2020.

Empirical Methods

Baseline Specification

We leverage the longitudinal nature of the data and estimate,

$$FI_{it} = \alpha_i + OAA'_{it}\beta_1 + \beta_2 SNAP_{it} + \delta_t + \varepsilon_{it} \quad (1)$$

where FI_{it} is individual *i*'s food insecurity status in year *t*, α_i are individual fixed effects, OAA_{it} includes indicators for OAA service usage (CM, HDM, and other OAA services) equaling one if the service was used in the month preceding the food insecurity assessment, $SNAP_{it}$ is defined similarly for SNAP receipt in the previous month, and δ_t are year fixed effects. We use service/program usage from the month preceding the food insecurity assessment for two reasons: (1) the assessment asks about the previous 30 days, and (2) the assessment is many times administered concurrently with first-time OAA service usage. Thus, the previous month's service usage more accurately coincides with experiences of food hardships.

The identifying assumption is the vector of individual effects α_i will capture any time-invariant unobservables that are correlated with self-selection into nutrition programs. This assumption is unlikely to hold given that time-varying unobservables in ε_{it} could be correlated with nutrition services participation and food insecurity status.

We are not overly concerned about omitted variable bias for two reasons. First, we will show the inclusion of individual fixed effects substantially alter program effects, implying individual fixed effects work to control for substantial time-invariant characteristics related to both program take-up and food insecurity.

Second, the sign of the bias implies any estimate showing a reduction in food insecurity is conservative (i.e., likely upward biased towards zero). For example, suppose the omitted variable is a time-varying adverse shock Z_{it}. We would expect the sign of the coefficient on Z_{it}, if observed and included in equation (1), to be positive, thereby increasing food insecurity. Moreover, we would also expect Z_{it} to be positively correlated with service take-up. Together, this implies the bias on β_1 and β_2 is an upward bias. Meaning a significantly negative β_1 or β_2 coefficient estimate is conservative.

Dual Enrollment in OAA and SNAP Specification

We sought to understand how dual enrollment affects food insecurity outcomes and therefore estimate the following

$$FI_{it} = \alpha_i + OAA'_{it}\beta_1 + \beta_2 SNAP_{it} + SNAP_{it} \times OAA'_{it}\theta_1 + \delta_t + \varepsilon_{it} \quad (2)$$

such that the vector θ_1 will pick up any compounding effects.

COVID-19 Specification

We re-estimate equation (1) by interacting OAA_{it} and $SNAP_{it}$ with an indicator for the pre-COVID period (i.e., January 2018 through February 2020)

$$FI_{it} = \alpha_i + OAA'_{it}\beta_1 + \beta_2 SNAP_{it} + (Pre \times OAA'_{it})\gamma_1 + \gamma_2(Pre \times SNAP_{it}) + \delta_t + \varepsilon_{it} \qquad (3)$$

where Pre is the pre-COVID indicator. This allows us to disentangle the effects of services during the COVID months as compared to the previous two years.[6, 7] Specifically, the effect of services during the pandemic is captured by β_1 and β_2, while γ_1 and γ_2 tells us how the pre-pandemic period differed.

Results

For all results, the coefficient estimate is interpreted as the impact of service use on the probability of being food insecure during the month preceding the food insecurity assessment. Standard errors are clustered at the individual level.

Baseline Results for the Pooled Model: January 2018 – August 2020

Regression results from equation (1) are presented in table 6. The first column (OLS) excludes individual fixed effects, which treats each year as a separate cross-section, effectively ignoring the longitudinal nature of the data. In general, estimates are substantially altered for the fixed effects (FE) model, implying individual fixed effects work to control for time-invariant characteristics related to both program take-up and food insecurity.

When interpreting results from equation (1), keep in mind program delivery of congregate meals (CM) and other OAA services (e.g., in-home services and caregiver services) were altered

[6] We also tried a full interaction of each survey year on services. We found the effects in 2018 and 2019 to be very similar (see appendix table A1) and therefore choose a more parsimonious specification.

[7] We also combined equations (2) and (3) to understand if any dual-enrollment effects during COVID exist via a triple interaction of program services, an indicator for 2020, and an indicator for SNAP. Results did not change from the previous models, as shown in appendix table A2.

during the COVID-19 pandemic, while SNAP benefits increased substantially. For example, over the period January 2018 to August 2020, the effect of CM is to increase food insecurity by 3.6 percentage points, while HDM and other OAA services reduce food insecurity by 3.1 and 4.4 percentage points, respectively, with no effect of SNAP. However, it could be the case that each of these services/programs had differing effects prior to, and during COVID. We explore this possibility below after examining any compounding effects of SNAP.

Dual Enrollment in OAA and SNAP Results

Table 7 presents results from equation (2). We find no evidence of a dual-enrollment effect. Moreover, the coefficients on OAA services largely remain unchanged from the previous specification (equation 1).

COVID-19 Results

Table 8 presents the *marginal* effects of program/service usage on food insecurity prior to, and during the COVID-19 pandemic months (see, appendix table A3 for full results on each coefficient).

First, virtually all of the positive relationship between CM and food insecurity found in table 6 is concentrated during the COVID period. This makes sense given that many CM sites, if not all sites by May/June 2020, were closed and "congregate" meal delivery shifted to emergency home delivered meals and/or drive through pick up at limited locations. Thus, one interpretation of these results is the loss of "traditional" congregate meals delivery in a social setting during the pandemic led to an increase in food insecurity reports, while CM had no effect of food insecurity prior to the pandemic.

Second, the effect of HDM and other OAA services on food insecurity remained stable over the sample period. Although the marginal effects of HDM are insignificant in the pre- and post-COVID period (table 8), the overall marginal effect in any period is significant (table 6). In other words, we can conclude HDM reduce food insecurity by roughly three percentage points. Similarly, results in table 8 imply other OAA services reduced food insecurity by roughly four percentage points over the sample period. As mentioned above, any bias from omitted variables is likely to be positive (upward bias), meaning that the pre-COVID relationship is most likely to be even further from zero (i.e., more negative).

One of the larger effects of reducing food insecurity during the COVID months for older Georgians was SNAP. The effect of SNAP receipt on reducing food insecurity more than doubled during the pandemic, increasing from 2.1 to 4.7 percentage points. This may be due in part to the quick deploy of SNAP emergency resources and new flexibilities during the pandemic including SNAP emergency allotment approved on March 23, 2020 in Georgia bringing maximum benefits to SNAP households not already receiving maximum benefits and adjustments to interview requirements and certification periods, and reporting requirements. Once again, it is worth mentioning that all coefficients are likely biased upward, implying the pre-COVID effect of SNAP is likely more negative, and the effect of SNAP during the COVID months likely reduced food insecurity no less than what is reported in table 8.

Discussion

This research contributes to the literature on three fronts: 1) enhancing our capacity to better understand current usage patterns of major public assistance programs in nutrition and aging in

lower-income older Americans, 2) examining (plausibly) causal effects of nutrition assistance program participation on food insecurity, and 3) providing policy innovations.

First, the approaches explored in this study align with the Evidence-Based Policymaking Commission Act of 2016 with the goal of exploring ways to utilize program administration data for policy research, including program evaluation.[8] In particular, we demonstrated the strength of ongoing programmatic data collection efforts with regards to food insecurity, as linked with administrative data. Further, the linkage to multiple administrative data, in this case OAA service and SNAP usage data, has proved quite useful. Obviously, no one could foresee the pandemic, yet the resiliency of program operations and data collection effects proved invaluable. In order to support future research using this approach, it is critical to establish standardized procedures guiding interagency data sharing and linkage processes for researchers and the agencies, as well as the guidance surrounding the privacy and confidentiality in the use of individual-level data.

Second, the findings of this study should help begin to fill the gap in the literature on (plausibly) causal relationships between nutrition assistance programs and food insecurity among low-income older adults. In short, we find all assistance programs shielded seniors from food insecurity in some capacity, especially with regards to SNAP and CM during the COVID-19 pandemic.

Third, the results of this study should inform evidence-based practices, programs, and guidelines to address food insecurity and the related burden of ever-increasing older populations. Our findings shed light on promising strategies to identify and prioritize the older population's food assistance needs before and during the pandemic, link appropriate services to meet their needs within the bounds of limited resources and evaluate program outcomes. Moreover, our approach

[8] H.R.4174 - Foundations for Evidence-Based Policymaking Act of 2018

suggests models to develop an integrated collaboration among the federal nutrition assistance programs and aging services network, such as our approach linking administrative datasets from two state agencies responsible for providing food assistance services to low-income older adults.

Finally, and perhaps most importantly, it should be recognized that the OAA has been underfunded. The real dollar value of funding has been decreasing for many years (figure 4). Moreover, half of all local service providers have a waiting list for HDM, and one-quarter have waitlists for CM (Mabli and Ohls 2015). Why should older, low-income Americans have to wait for food assistance?. The 80-plus percentage increase in OAA funding during the COVID-19 pandemic appears to work, given our findings. Policymakers should strongly consider maintaining a robust funding schedule for the OAA in the years to come.

Conclusion

The lessons and experiences from our administrative dataset development process have the potential to suggest robust standards and best practices for linking and using administrative data for food assistance program planning, policy decision making, and collective impact evaluation, and develop a roadmap to guide other states in establishing similar data. The findings from this project can inform program administrators and policymakers regarding the effectiveness of food assistance and healthcare programs (e.g., Medicare and Medicaid) and enhance the delivery of public assistance programs and other services targeted to meet the unique needs and demands of older adults.

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Tables and Figures

Table 1. State administrative datasets on food insecurity and public assistance program participation

GA DAS Dataset (January 1, 2012-August 31, 2020)		**GA DFCS Dataset (January 1, 2018-August 31, 2020)**
Demographics File	142,147 individuals	221,760 records (by month) 14,557 individuals
Food Insecurity File	262,625 records	
	98,065 individuals	
Services File	245,294 records	
	102,247 individuals	

Table 2. GA DAS data flowchart for Food Insecurity (FI) and services files

	Records (n)	**Individuals (n)**
Original file, January 1, 2012-August 31,2020	262,625	98,065
Non-missing FI scores	261,359	97,841
Unduplicated FI scores for month/year combination	256,958	97,481
FI assessment year ≥ 2018	68,543	39,314
Retain first FI assessment per year for those with multiple assessments within the year	63,269	39,314
FI assessment and service use in 2 or 3 years, 2018-2020	27,659	10,954
At least one FI assessment and service use in each study year	17,265	5,755

Table 3. Characteristics of older Georgians using nutrition and aging services, 2018

Characteristics	Total population (N=10,954)	Study sample (n=5,755, 52.5%)	Excluded sample (n=5,199, 47.4%)
Age, years, mean±SD*	74.6±10.8	76.5 ±10.6	72.4 ±10.5
≤60, %*	6.9	4.0	10.1
60-74, %	44.4	39.8	49.6
75-84, %	30.2	33.0	27.0
≥85, %	18.5	23.2	13.3
Female, %*	72.8	74.1	71.3
Race, %*			
White	43.1	44.6	41.5
Black	46.2	46.4	46.1
Other	5.3	4.4	6.2
Living alone, %*	43.4	45.4	41.2
Marital Status, %*			
Married	24.2	24.3	24.0
Widowed	39.1	41.9	35.9
Other	32.5	31.2	34.0
Household income ≤ FPL, %*	42.7	45.0	40.2

Note: *indicates the study sample is significantly different from the excluded sample at $p<0.001$

Table 4: Characteristics of older Georgians by SNAP and Older Americans Act Program Participation, 2018 (N = 5,755)

Characteristics	Older Americans Act Programs						SNAP	
	CM		HDM		Other OAA			
	Yes	No	Yes	No	Yes	No	Yes	No
	(n=3,084, 53.6)	(n=2,671, 46.4)	(n=2,320, 40.3)	(n=3,435, 59.7)	(n=4,862, 84.5)	(n=893, 15.5)	(n=1,257, 21.8)	(n=4,498, 78.2)
Age, years, mean±SD	76.0±10.4*	77.1±10.9	77.20 ± 10.9*	76.05±10.4	76.71 ±10.6*	75.44 ±10.6	76.30 ± 10.45	76.57 ±10.7
≤60, %	3.9*	4.0	3.7*	4.1	4.1*	3.5	3.7	4.0
60-74, %	41.3	38.1	37.8	41.1	39.1	43.7	42.0	39.2
75-84, %	34.7	31.2	31.3	34.2	32.9	33.6	32.1	33.3
≥85, %	20.1	26.7	27.2	20.4	23.9	19.2	22.2	23.4
Female, %	75.7*	72.3	71.2*	76.1	74.9*	69.7	79.5*	72.6
Race, %								
White	48.0*	40.8	43.2*	45.6	42.5*	56.1	30.3*	48.6
Black	46.0	46.8	44.8	47.5	49.1	31.4	62.4	41.9
Other	3.4	5.6	6.2	3.2	3.6	8.7	2.5	4.9
Living alone, %	45.2*	45.7	48.6*	43.9	46.4*	39.8	65.8*	39.7
Marital Status, %								
Married	28.4*	19.6	19.8*	27.4	23.0*	31.8	7.6*	29.0
Widowed	40.9	43.1	43.8	40.6	42.5	38.8	45.3	41.0
Others	27.6	35.3	35.0	28.7	32.2	26.1	45.7	27.2
Household income ≤ FPL, %	39.4*	51.4	52.8*	39.7	46.4*	37.1	68.7*	38.3

Note: CM=Congregate meals participants; HDM=Home delivered meals program participants; Other OAA=NON-Older Americans Act Nutrition Programs participants; SNAP=Supplemental Nutrition Assistance Program; FPL=Federal Poverty Level

* Significantly different from those not receiving the respective program at $p<0.05$

Table 5. Service/program usage and food insecurity rates for older Georgians continuously receiving OAA services: 2018-2020

	2018 (Jan-Dec)	**2019 (Jan-Dec)**	**2020 (Jan-Aug)**
Panel A: Service/Program usage (%)			
Congregate meals	40.83	53.29	53.87
Home-delivered meals	33.07	40.26	41.25
Other OAA services	49.63	63.93	65.06
SNAP	18.58	20.31	20.87
Panel B: Food insecurity rates (%)			
Total	17.0	14.5	11.7
Congregate meals	8.9	7.0	7.2
Home-delivered meals	28.4	24.5	17.8
Other OAA services	17.2	14.6	11.8
SNAP	27.5	23.6	18.8

Notes: All trends are significantly different from no trend at $p<0.001$. N=5,755

Table 6. Results from the pooled model, equation (1)

Variables	(1) OLS	(2) Fixed Effects
Congregate meals	-0.0787***	0.0362***
	(0.0098)	(0.0104)
Home-delivered meals	0.0649***	-0.0328*
	(0.0109)	(0.0188)
Other OAA services	-0.0032	-0.0409***
	(0.0072)	(0.0127)
SNAP	0.0818***	-0.0319*
	(0.0103)	(0.0190)
2018	0.0472***	0.0459***
	(0.0055)	(0.0054)
2019	0.0268***	0.0255***
	(0.0043)	(0.0043)
Constant	0.1104***	0.1558***
	(0.0132)	(0.0148)
Observations	17265	17265
Individuals	5755	5755
R-squared (within)		0.017

Notes: Standard errors in parentheses, clustered at the individual level. All regressions include month fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7. Results with SNAP interactions, equation (2)

Variables	(1) OLS	(2) Fixed Effects
Congregate meals	-0.0798***	0.0365***
	(0.0102)	(0.0105)
Congregate meals x SNAP	0.0056	-0.0116
	(0.0278)	(0.0308)
Home-delivered meals	0.0666***	-0.0304
	(0.0117)	(0.0201)
Home-delivered meals x SNAP	-0.0072	-0.0145
	(0.0279)	(0.0348)
Other OAA services	-0.0013	-0.0357***
	(0.0074)	(0.0128)
Other OAA services x SNAP	-0.0107	-0.0316
	(0.0215)	(0.0277)
SNAP	0.0899***	0.0017
	(0.0289)	(0.0331)
2018	0.0472***	0.0459***
	(0.0055)	(0.0054)
2019	0.0268***	0.0255***
	(0.0043)	(0.0043)
Constant	0.1093***	0.1519***
	(0.0135)	(0.0152)
Observations	17265	17265
Individuals	5755	5755
R-squared (within)		0.017

Notes: Standard errors in parentheses, clustered at the individual level. All regressions include month fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8. Marginal effects from equation (3), pre- and during COVID-19 effects

Marginal effects	(1) OLS	(2) Fixed Effects
Congregate meals - pre-COVID	-0.0957***	0.0155
	(0.0103)	(0.0104)
Congregate meals - during COVID	-0.0340**	0.0696***
	(0.0164)	(0.0182)
Home-delivered meals - pre-COVID	0.0696***	-0.0217
	(0.0119)	(0.0189)
Home-delivered meals - during COVID	0.0696***	-0.0314
	(0.0164)	(0.0231)
Other OAA services - pre-COVID	-0.0021	-0.0323**
	(0.0080)	(0.0129)
Other OAA services - during COVID	0.0001	-0.0442***
	(0.0093)	(0.0141)
SNAP - pre-COVID	0.0847***	-0.0205
	(0.0118)	(0.0194)
SNAP - during COVID	0.0772***	-0.0469**
	(0.0123)	(0.0206)
Observations	17265	17265
Individuals	5755	5755
R-squared (within)		0.024

Notes: Standard errors in parentheses, clustered at the individual level. All regressions include month fixed effects. Estimated coefficients in appendix Table A3, in which the interactions terms provide statistical significance between the marginal effects pre and during COVID.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 1. Data merging process

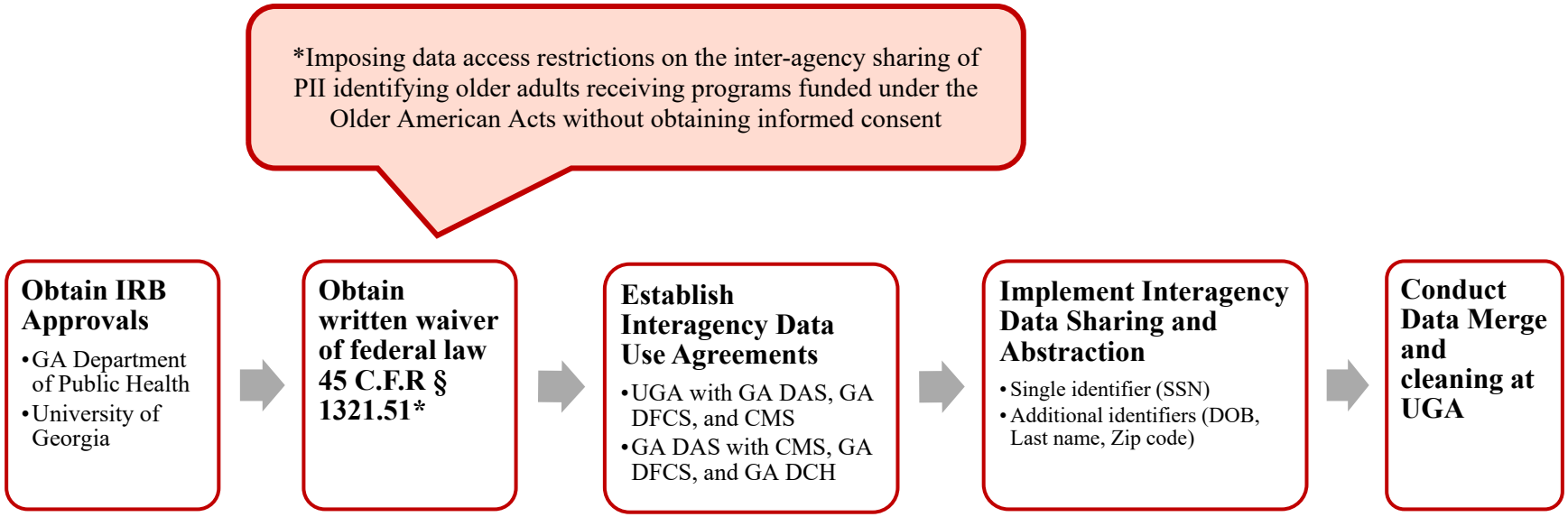


Figure 2. Study timeline

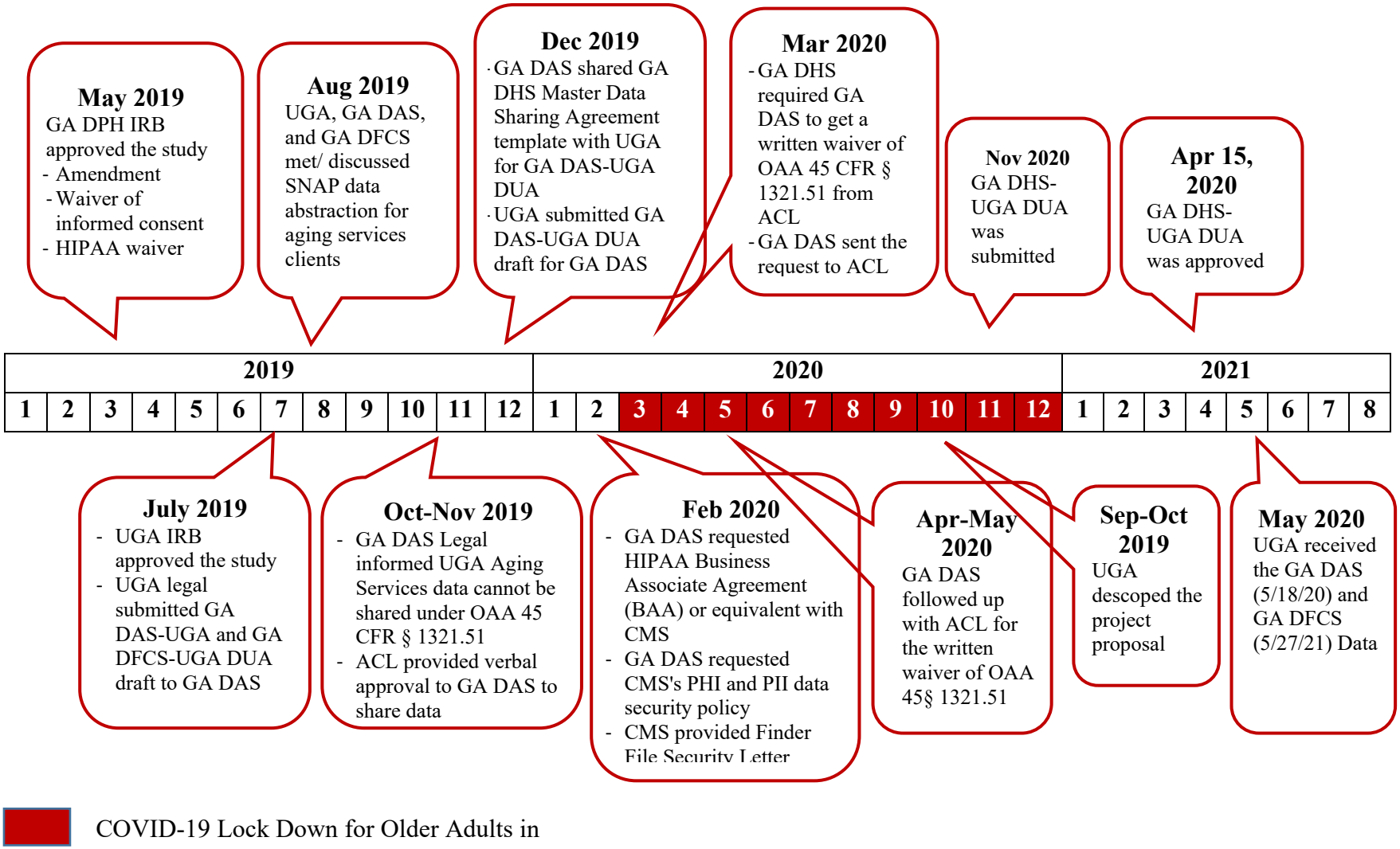


Figure 3. Interagency data sharing and abstraction process

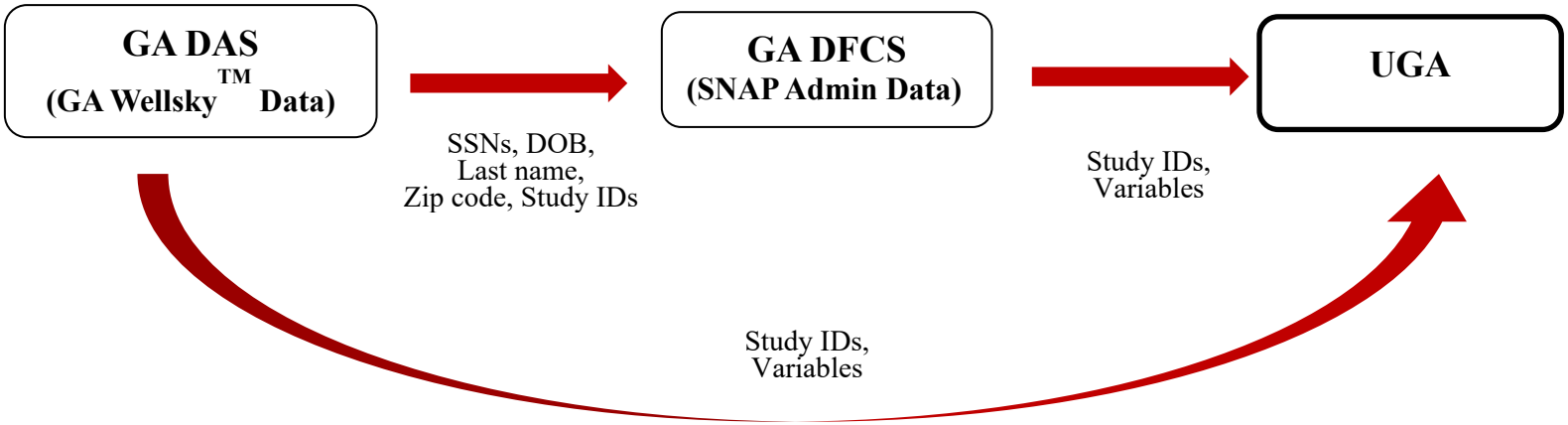
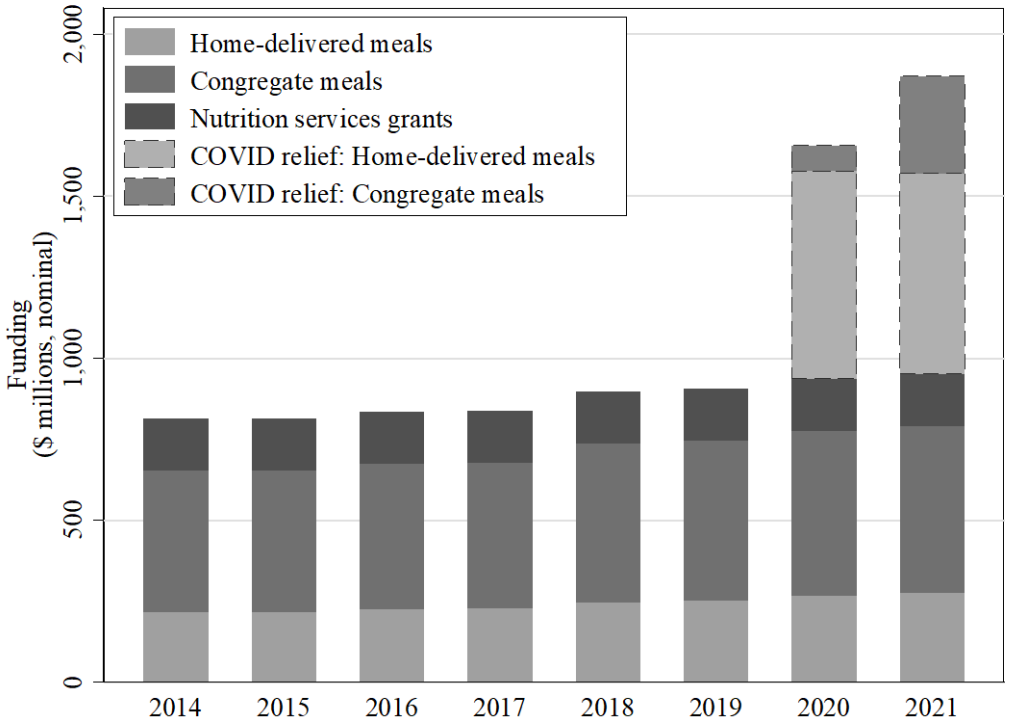


Figure 4. Federal funding for Older Americans Act (OAA) Title III Nutrition Program services



Source: Adapted from Congressional Research Service Report # R43414, *Older Americans Act: Overview and Funding*

Appendix

Table A1. Marginal effects from equation (2) for full year interactions

	(1) Fixed Effects
Congregate meals (2018)	0.0121 (0.0110)
Congregate meals (2019)	0.0229 (0.0173)
Congregate meals (2020)	0.0717*** (0.0195)
Home-delivered meals (2018)	-0.0194 (0.0202)
Home-delivered meals (2019)	-0.0184 (0.0218)
Home-delivered meals (2020)	-0.0290 (0.0236)
Other OAA services (2018)	-0.0355** (0.0141)
Other OAA services (2019)	-0.0250* (0.0134)
Other OAA services (2020)	-0.0420*** (0.0142)
SNAP (2018)	-0.0090 (0.0210)
SNAP (2019)	-0.0311 (0.0199)
SNAP (2020)	-0.0473** (0.0206)
Observations	17265
Individuals	
R-squared (within)	

Notes: Standard errors in parentheses, clustered at the individual level. All regressions include month fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A2. Equation (2) with SNAP and pre-COVID interactions

	(1) OLS	(2) Fixed Effects
Congregate meals	-0.0464**	0.0579***
	(0.0181)	(0.0199)
Congregate meals x SNAP	0.0565	0.0452
	(0.0421)	(0.0462)
Congregate meals x (pre-COVID)	-0.0473***	-0.0406**
	(0.0180)	(0.0174)
Congregate meals (pre-COVID) x SNAP	-0.0676	-0.0618
	(0.0432)	(0.0406)
Home-delivered meals	0.0606***	-0.0408
	(0.0184)	(0.0256)
Home-delivered meals x SNAP	0.0396	0.0375
	(0.0405)	(0.0466)
Home-delivered meals x (pre-COVID)	0.0135	0.0211
	(0.0187)	(0.0179)
Home-delivered meals (pre-COVID) x SNAP	-0.0617	-0.0490
	(0.0427)	(0.0399)
Other OAA services	0.0017	-0.0430***
	(0.0095)	(0.0140)
Other OAA services x SNAP	-0.0094	-0.0107
	(0.0292)	(0.0352)
Other OAA services x (pre-COVID)	-0.0029	0.0144*
	(0.0096)	(0.0086)
Other OAA services (pre-COVID) x SNAP	0.0029	-0.0133
	(0.0298)	(0.0282)
SNAP	0.0383	-0.0785
	(0.0460)	(0.0520)
SNAP x (pre-COVID)	0.0653	0.0855*
	(0.0470)	(0.0448)
2018	0.0663***	0.0444**
	(0.0192)	(0.0184)
2019	0.0473**	0.0243
	(0.0194)	(0.0184)
Constant	0.0922***	0.1517***
	(0.0208)	(0.0230)
Observations	17265	17265
Individuals	5755	5755
R-squared (within)		0.025

Notes: Standard errors in parentheses, clustered at the individual level. All regressions include month fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A3. Coefficient estimates from equation (3) with COVID-19 interactions

	(1) OLS	(2) Fixed Effects
Congregate meals	-0.0340**	0.0696***
	(0.0164)	(0.0182)
Congregate meals x (pre-COVID)	-0.0617***	-0.0541***
	(0.0162)	(0.0158)
Home-delivered meals	0.0696***	-0.0314
	(0.0164)	(0.0231)
Home-delivered meals x (pre-COVID)	-0.0000	0.0098
	(0.0166)	(0.0160)
Other OAA services	0.0001	-0.0442***
	(0.0093)	(0.0141)
Other OAA services x (pre-COVID)	-0.0022	0.0119
	(0.0092)	(0.0086)
SNAP	0.0772***	-0.0469**
	(0.0123)	(0.0206)
SNAP x (pre-COVID)	0.0075	0.0264**
	(0.0126)	(0.0119)
2018	0.0787***	0.0575***
	(0.0175)	(0.0170)
2019	0.0599***	0.0374**
	(0.0177)	(0.0169)
Constant	0.0829***	0.1424***
	(0.0194)	(0.0215)
Observations	17265	17265
Individuals		5755
R-squared (within)		0.024

Notes: Standard errors in parentheses, clustered at the individual level. All regressions include month fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$