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# Simulating the Impact of Implementing Preliminary Food Security Screening Procedures in the Status of Forces Survey of Active Duty Members

Laura J. Hales, Matthew P. Rabbitt, and Shellye Suttles





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## Abstract

Previous USDA, Economic Research Service research showed that active duty service members were nearly 2.5 times more likely to live in a food-insecure household than their socioeconomically similar civilian adult counterparts in 2018 and 2020. However, due to data limitations, this research was not able to account for the methodological differences between food security survey measurement techniques for the active duty military and civilian populations. One important methodological difference is that the Current Population Survey Food Security Supplement (CPS-FSS), which is used to measure food security among civilians, uses screening procedures to reduce respondent burden, while the Status of Forces Survey of Active Duty Members (SOFS-A), used to measure food security among active duty service members, does not. The difference in screening procedures used in these two surveys may at least partially account for differences in previous estimates of food security across these groups. This report uses a novel application of a statistical approach that simulates the preliminary screening procedure that is absent from the military survey to adjust 2022 food insecurity prevalence estimates for service members, based on the SOFS-A. The statistical approach first uses civilian survey data from the 2022 CPS-FSS to construct a civilian sample that is representative of the service member sample and then applies logistic regression modeling to simulate the results of the CPS-FSS preliminary screening procedure and its impact on the food insecurity prevalence estimates of service members. The authors find that the simulated preliminary screening procedure reduces the prevalence of military food insecurity from 41.0 percent to 14.1 percent in 2022. Results from the simulation analysis may be considered a lower bound for the measured prevalence of food insecurity for the population of active duty service members since food security screening procedures generally lead to lower rates of food insecurity.

**Keywords:** active duty, civilian adults, food insecurity, military service, SF-FSSM

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# Simulating the Impact of Implementing Preliminary Food Security Screening Procedures in the Status of Forces Survey of Active Duty Members

## Introduction

Food insecure military households, like their civilian counterparts, were, at times, unable to acquire adequate food for one or more household members because they had insufficient money for food. While some of these differences can be explained by observable differences in the active duty and civilian populations (e.g., age, education, and household income), in making their comparisons, Rabbitt and Beymer (2024) could not fully account for methodological differences in the two surveys used to collect information on food security, and thus, fully compare food security in the two populations.

The U.S. Department of Agriculture (USDA) has collected food security information for civilian households since 1995 using the validated U.S. Household Food Security Survey Module (HFSSM), which has been periodically revised to change the wording or order of the questions (Coleman-Jensen, 2025). The Food Security Supplement to the Current Population Survey (CPS-FSS), a national survey on civilian households' food security status, was sponsored annually by USDA, Economic Research Service (ERS) and collected by the U.S. Department of Commerce, Bureau of the Census. The CPS-FSS collects information on households' food expenditure, food security status, and food and nutrition assistance program participation using phone and in-person interviews. The Status of Forces Survey of Active Duty Members (SOFS-A), on the other hand, administers a different set of food security questions (a six-item short-form survey) utilizing a different modality (an online survey) to collect information during a different time period (summer through fall 2022) on the food security status of a specific subpopulation (active duty service members and their dependents). Another primary difference between the two surveys' food security data collection procedures is the use of preliminary screening procedures in the CPS-FSS.<sup>1</sup> These screening procedures are used to reduce respondent burden and avoid asking questions to respondents who are unlikely to experience food insecurity based on their total household income and reports of food-affordability and acquisition problems.<sup>2</sup> These screening procedures are not used in the SOFS-A. Given the difference in screening procedures between the military-focused SOFS-A and the civilian-focused CPS-FSS, we offer a statistical approach that would allow Department of War (DoW) and USDA senior leadership, military leaders, military- and veteran-oriented nongovernmental organizations, food security researchers,

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<sup>1</sup> Additionally, there are several national food security surveys that use variations of the HFSSM without screening procedures, including the Medical Expenditure Panel Survey (MEPS), National Health and Nutrition Examination Survey (NHANES), and National Health Interview Survey (NHIS).

<sup>2</sup> The CPS-FSS also employs internal screening procedures in the HFSSM. However, these additional screening procedures are not examined in this report because the SOFS-A utilizes a short-form food security-survey module where there is limited utility for these additional screening procedures.

and the general public to better compare military and civilian adult prevalence estimates based on the SOFS-A and CPS-FSS, respectively.

Screening procedures within surveys are just one methodological factor that leads to differences in food security prevalence estimates. Other methodological factors to consider include inherent characteristics of differing populations, sampling techniques, different survey modalities, a variety of survey questions which may or may not include screening procedures, and, ultimately, different weighting schemes to make survey samples representative of the population. Thus, there are benefits and challenges to implementing screening procedures in food security data collections. While survey methodological research demonstrates that different survey modes (i.e., in person versus online) can reasonably approximate food security prevalence estimates obtained from national surveys such as the CPS-FSS (Ahn et al., 2020), additional methodological factors are important. To reasonably approximate national food security statistics, Ahn et al. (2020) demonstrated that these alternate surveys with representative samples must also adopt the income, food-affordability, and food-acquisition preliminary screening protocols used in the CPS-FSS to produce similar food security prevalence estimates. When Ahn et al. (2020) applied post hoc screening procedures to their online survey results, food insecurity prevalence estimates were roughly 23–53 percent lower than estimates produced with no screening protocols. There are benefits, however, to assessing food security without screening procedures, as recent studies suggest (Ahn et al., 2020; Rabbitt & Beymer, 2024). These surveys contain much more information about the respondents' experiences with food security because all households are screened into the food security survey module, regardless of household income or responses to screening questions. Therefore, a trade-off exists between the comparability of food security prevalence estimates based on different data collection methods and the potential research utility of the data.

Although there are multiple factors that may contribute to the difference in food insecurity prevalence between military and civilian populations, adjusting for the difference in screening procedures easily improves comparability. This study contributes to the methodological literature on food security measurement and survey methods with a novel application of a statistical approach that starts by using the CPS-FSS to construct a civilian adult sample that is representative of the SOFS-A's service member sample based on overlapping demographic and economic characteristics. Second, the approach applies logistic regression modeling to each of the two datasets to simulate the results of applying the CPS-FSS preliminary screening procedure to the SOFS-A and its impact on the food insecurity prevalence of active duty service members.

This report's data section begins with a detailed explanation of both the CPS-FSS and SOFS-A datasets. A section on empirical methodology explains the statistical technique used to simulate the impact of implementing the CPS-FSS preliminary screening procedures in the SOFS-A dataset. It is followed by a results section that shows the factors that predict food-affordability and acquisition problems in the civilian adult population and the impact of using the same factors to predict whether high-income (those with total household income above 185 percent of the Federal poverty line) service members would have food-affordability and acquisition problems that indicate a risk for food insecurity. The

report ends with a discussion and conclusion section that reflects on the methodological implications of the findings, limitations of the analysis, and opportunities for future research.

## Data

Data on the population of active duty service members (henceforth referred to as the military population) was drawn from the 2022 Status of Forces Survey of Active Duty Members (SOFS-A). SOFS-A is an online survey designed to gather information about active duty service members and their households (U.S. Department of War, Office of People Analytics (OPA), 2021). Participants are randomly selected and sent an invitation by email or by mail (OPA, 2025). The survey is stratified and weighted to meet population representation across branch of service, paygrade group, sex, family status, and duty location (Asia and Pacific Islands, Europe, the United States, U.S. territories, other, and unknown).<sup>3</sup> The 2022 SOFS-A was fielded over several months, starting from July 7 through October 11, 2022 to approximately 125,000 individuals representing about 1.3 million active duty service members whose paygrades are between E-1 and O-6 (i.e., excluding all general and flag officers).<sup>4</sup>

Data on the civilian, noninstitutionalized adult population (henceforth referred to as civilian adult population) was drawn from the 2022 Current Population Survey Food Security Supplement (CPS-FSS). The CPS-FSS uses phone and in-person interviews to collect household-level data and is typically fielded in the second week of December.<sup>5</sup> The CPS-FSS uses an address-based probability sample of approximately 40,000 households and is stratified, clustered, and reweighted to meet Census Bureau population totals. The methodology for the CPS-FSS has been described in various publications over the years (Bickel et al., 2000; National Research Council, 2006; Rabbitt et al., 2024).

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<sup>3</sup> Coast Guard service members are included in all analyses in this report. Therefore, the food insecurity statistics in this report will not match those produced by the U.S. Department of War.

<sup>4</sup> Although the SOFS-A is administered only to service members between paygrades E-1 and O-6, the DoW sets base pay for all active duty service members across paygrades: E-1–E-9 for enlisted members, W-1–W-5 for warrant officers, O-1E–O-3E for commissioned officers with more than 4 years of active duty service as an enlisted member or warrant officer, and O1–O10 for commissioned officers (DoW, 2021). The active duty paygrade scale varies by years of service for paygrades E-3 and above. For example, in calendar year 2021, all E-1 enlisted service members earned \$1,785.00 monthly (161 percent of the Federal poverty line for a single-person household) while an O-6 commissioned officer with 40 years of service earned \$12,638.40 monthly. Active duty service members also receive additional allowances and entitlements, such as Basic Allowance for Housing, Basic Needs Allowance, Family Separation Allowance, Hazardous Duty Incentive Pay, etc., in addition to their base pay.

<sup>5</sup> The 2022 CPS-FSS was conducted December 11–20, 2022.

Figure 1

**Comparing the USDA adult (10-item) and short-form (6-item) food security survey modules**

	Food security status	Raw score	Food security survey module questions	
<b>Increasing severity of adult food insecurity</b> 	Food secure	High food security	0	
		Marginal food security	1	We worried whether our food would run out before we got money to buy more.
	2		<b>The food that we bought just didn't last and we didn't have money to get more.</b>	
	3		<b>We couldn't afford to eat balanced meals.</b>	
	Low food security	4	<b>In the last 12 months, did you or other adults in the household ever cut the size of your meals?</b>	
		5	<b>How often did this happen?</b>	
		6	<b>In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?</b>	
		Food insecure	7	<b>In the last 12 months, were you ever hungry, but didn't eat because there wasn't enough money for food?</b>
			8	In the last 12 months, did you lose weight because there wasn't enough money for food?
	Very low food security	9	In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?	
10		How often did this happen?		

Note: Raw score = the count of affirmed food-security questions. Affirmative responses to the food-insecurity questions are “often,” “sometimes,” “almost every month,” “some months but not every month,” or “yes”. Bolded questions are included in the short-form food security survey module.

Source: USDA, Economic Research Service adapted from Rabbitt and Smith (2021).

The datasets have two important distinctions: (1) the food security survey modules and (2) the screening questions that prompt each survey's food security survey module. First, the CPS-FSS measures civilian household and adult food security based on a 10-item survey module that forms the adult-focused part of the USDA Household Food Security Survey Module (HFSSM) (figure 1).<sup>6</sup> The SOFS-A measures military adult and household food security with the USDA Short Form Food Security Survey Module (SF-FSSM), a six-item survey module (shown in bold in figure 1) that is a subset of the HFSSM. Although the HFSSM collects more information about a household's food conditions and produces more precise estimates of food insecurity, the SF-FSSM is often used to reduce respondent burden and nonresponse in national surveys.

Food security status scoring thresholds for the short-form food security scale were selected to produce food security statistics that are directly comparable (in terms of the severity of food hardship measured) with food security status assignments based on the 10-item scale. The short-form survey module has been shown to have reasonably high specificity, minimal bias, and to be suitably sensitive in relation to the HFSSM (Blumberg et al., 1999).

These six short-form questions capture the hardships households typically experience when they have trouble meeting their food needs. Each question asks whether a food hardship occurred for the adult respondent or their household in the previous 12 months. Each question specifies "a lack of money for food" as the cause of the hardship, ruling out food hardship caused by fasting or time constraints. Military and civilian adult respondents were assigned a food security status according to the number of food hardships reported based on the SF-FSSM.<sup>7</sup> Respondents (and other household members) were food secure if they reported fewer than two food hardships in the preceding 12 months.<sup>8</sup> Respondents who reported two or more food hardships were classified as food insecure. Food-insecure respondents can be further classified as having low or very low food security. Low food-secure respondents reported two to four hardships, while those with very low food security, a more severe form of food insecurity where one or more household members experience reduced food intake and disrupted eating patterns at times, reported five or six hardships.

Second, the food security survey modules in the SOFS-A and the CPS-FSS are administered differently to respondents. The CPS-FSS uses household income and two preliminary screening questions to

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<sup>6</sup> Households with children are asked an additional eight questions about children's food insecurity; however, these questions are not considered here because the SOFS-A does not collect information on child food security. This information is commonly referred to as the 18-item U.S. Household Food Security Survey Module (HFSSM).

<sup>7</sup> While the CPS-FSS collects information on food security using the 18-item HFSSM, only the 6 questions that overlap with those administered in the SOFS-A were used to assign a food security status to civilians. This was done to ensure military and civilian food security-status classifications were measured with similar levels of precision.

<sup>8</sup> The HFSSM, and other versions of the module, are designed to measure food insecurity at the household level. However, the focus of this report is to compare similar military and civilian adult samples and their responses to food insecurity questions. While it is informative to examine persons living in food-insecure households, these statistics should be interpreted carefully. Within a food-insecure household, each household member may be affected differently by the household's food insecurity. Some members (usually young children) may experience only mild effects or none, while adults are more severely affected. It is more precise to describe these statistics as representing "military or civilian adults living in food-insecure households" rather than as representing "food-insecure adults." Therefore, the food insecurity reported by a survey respondent cannot necessarily be attributed to specific members of their household.

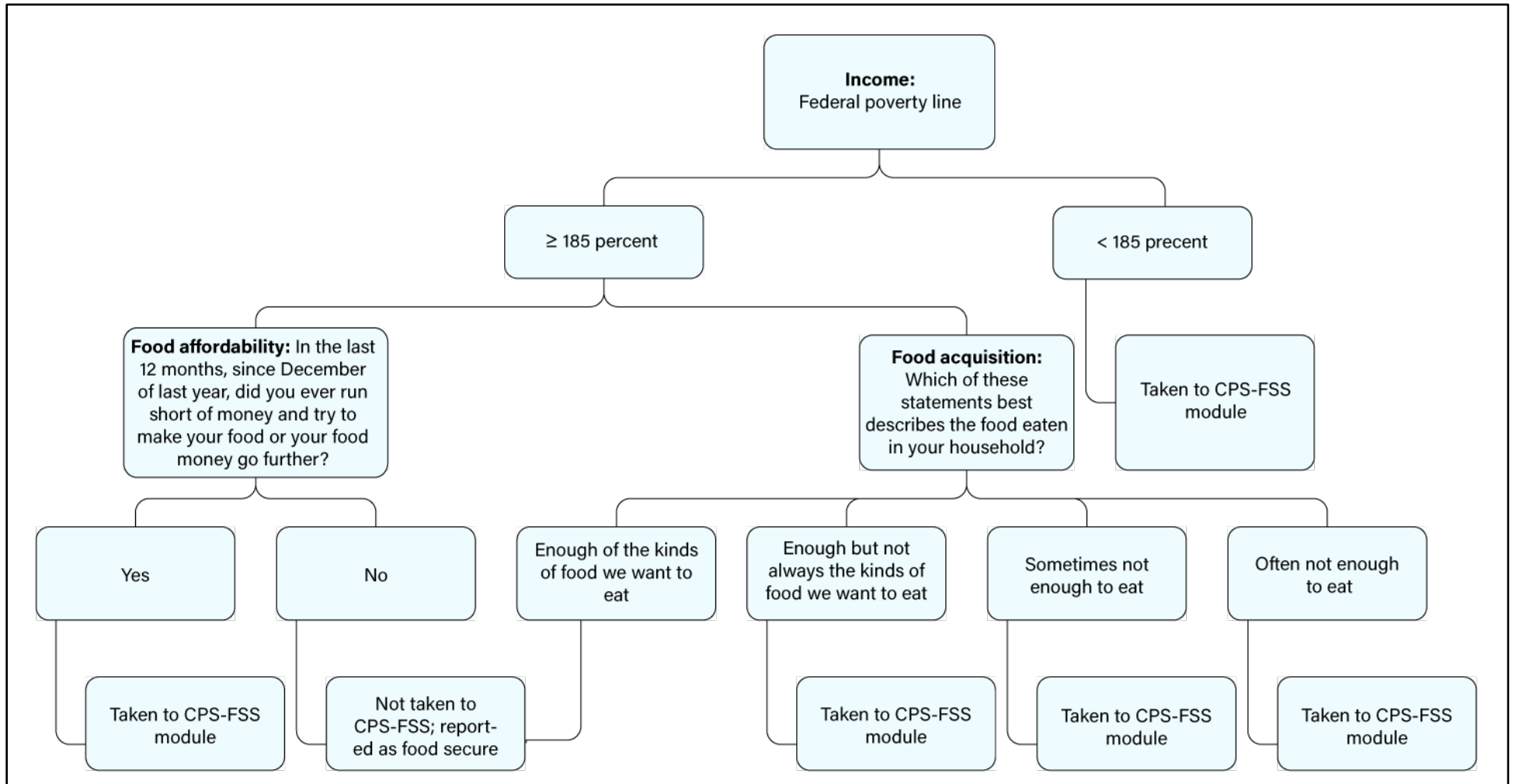
determine whether a household is administered at least part of the food security survey module questions; the SOFS-A does not utilize screening procedures. Screening questions reduce respondent burden, reduce the likelihood of respondents being administered irrelevant questions based on previously provided information, and ensure the households most likely to experience food insecurity enter the food security survey module. The screening questions collect information on food-affordability and acquisition problems among civilian adults using the following questions:

- “In the last 12 months, since December of last year, did you ever run short of money and try to make your food or your food money go further?” (Yes/No) and
- “Which of these statements best describes the food eaten in your household—enough of the kinds of food we want to eat, enough but not always the kinds of food we want to eat, sometimes not enough to eat, or often not enough to eat?”

Responses of “Yes” for the first screener question and/or “enough but not always the kinds of food we want to eat,” “sometimes not enough to eat,” or “often not enough to eat” for the second screener question indicate possible food-affordability and acquisition problems. The use of these screener questions in the 1995, 1996, and 1997 CPS-FSS modules was examined by Ohls et al. (2001), distinguishing households above and below 200 percent of the Federal poverty line. These authors concluded that a consistent use of screener questions is more important than the specific questions themselves. As a result, a common screening procedure has been used for the CPS-FSS since 1998 (Coleman-Jensen & Rabbitt, 2023).

Figure 2

**Current Population Survey Food Security Supplement (CPS-FSS) preliminary Household Food Security Survey Module screening procedures based on food affordability, food acquisition, and household income**



Note: This figure depicts the screening procedure used in the USDA Household Food Security Survey Module of the Current Population Survey Food Security Supplement. The Federal poverty line was \$27,479 for a family of four (two adults and two children) in 2021 and \$29,678 in 2022. Each year, the U.S. Department of Commerce, Bureau of the Census calculates poverty thresholds based on total family income, family size, and age of family members to determine poverty status.

Source: USDA, Economic Research Service.

Under the CPS-FSS preliminary screening procedures, households with incomes at or above 185 percent of the Federal poverty threshold<sup>9</sup> that indicate any food-affordability or acquisition issues based on their responses to the two screener questions are administered at least part of the food security survey module. Households with incomes below 185 percent of the Federal poverty threshold are also administered the food-affordability and acquisition questions but are screened into the food security survey regardless of their responses to these questions.<sup>10</sup> It should be noted that not every national survey that includes the HFSSM or other forms of the food security survey module utilizes preliminary screening procedures.

The scenarios presented in figure 2 lead us to examine the prevalence of food insecurity in military populations when the food-affordability and acquisition screener questions are simulated in the SOFS-A. As a result, we seek to compare the observed food security prevalence without screener questions and food security prevalence when we assume military populations with similar characteristics to an adult civilian population would be screened out, and deemed food secure, with simulated screener questions.

## Empirical Methodology

### Constructing a Civilian Adult Comparison Group

To simulate the impact of a preliminary food security screener on food security data collected in the SOFS-A, we first construct a sample of civilian adult respondents from the 2022 CPS-FSS who were observed to be economically and demographically similar to active duty service members who responded to the 2022 SOFS-A following the approach used by Rabbitt and Beymer (2024). This study improves upon that approach by including income in the construction of the sample, something that Rabbitt and Beymer (2024) were unable to incorporate due to data limitations. Civilian adult respondents were included in the sample if they were between the ages of 17 and 65, employed full time (working 35 or more hours per week), with at least a high school diploma (or equivalent), and not serving in the armed forces on active duty. These characteristics were selected for inclusion as they mimic the requirements for active military service. Active duty service members were excluded from the military sample if they currently live outside the continental United States so the food environment of military and civilian adults would be as similar as possible.

We construct an income-to-poverty measure to compare household income in the military and civilian populations relative to poverty thresholds determined by the Federal Government. This measure is used because the 2022 SOFS-A asks service members to report total 2021 income while the 2022 CPS-

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<sup>9</sup> The Federal poverty line was \$27,479 for a family of four (two adults and two children) in 2021 and \$29,678 in 2022.

<sup>10</sup> The CPS-FSS also includes internal screening procedures for the food security-survey module based on the responses to the food security questions. These additional screening procedures were not considered in this report since the SOFS-A uses a shorter form-food security survey module. If utilized, these internal screening procedures would only impact the subclassification of food insecure households as low versus very low food secure.

FSS asks the household respondent to report total 2022 income.<sup>11</sup> The income-to-poverty measure accounts for inflation by creating a ratio of income to Federal poverty thresholds for 2021 that allows for comparison of income in real terms. Income-to-poverty measures also standardize resources across household size and composition, allowing a comparison of household income to various levels of need. To calculate the income-to-poverty threshold, we first assign household income as the midpoint of each income category range in the SOFS-A and the CPS-FSS. Federal poverty thresholds are determined by the Census Bureau by household size and composition. Household size is reported in the CPS-FSS as the number of household members, including the number of children in the household, and we construct a similar measure of household size for the military population using information about marital status and number of military dependents.<sup>12</sup> We calculate income-to-poverty ratios by dividing income by the Census Bureau poverty threshold that corresponds to each household's size and composition (U.S. Department of Commerce, Bureau of the Census, 2025). Those with incomes at or above 185 percent of the Federal poverty line are referred to as higher income households in this report.<sup>13</sup>

Remaining observable differences in the profiles of the military and civilian adult samples were addressed through iterative proportional fitting, a method which iteratively adjusts the CPS-FSS personal survey weights for the sample of civilian adult respondents until the economic and demographic profiles for the military and civilian adult samples align. The criteria for the iterative adjustment procedure included sex, age, race and ethnicity, marital status, parental status, educational attainment, spouse's employment status (if married), household income, and geographic region of residence.

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<sup>11</sup> Some households in the Current Population Survey did not report their income because they did not know or refused to provide it. The Census Bureau imputed income for those households and identified which households did not report their income. The authors calculated the household income-to-poverty ratio only for households with reported income for their analyses.

<sup>12</sup> The definition of dependent in the SOFS-A includes children, other legal dependents, or anyone in the family except the spouse who has, or is eligible to have, a Uniformed Services Identification and Privilege Card (also called a military ID card) or is eligible for military health care benefits and is enrolled in the Defense Enrollment Eligibility Reporting System (DEERS).

<sup>13</sup> Each fall, USDA, ERS determines the poverty-income-screening-threshold equivalent to 185 percent of the poverty threshold for the food security-survey module in advance so the Census Bureau can finalize the December survey instrument and test its computer-assisted telephone interview systems. These screening thresholds are determined by USDA, ERS economists by adjusting the existing Census Bureau poverty thresholds for a given year by the anticipated rate of inflation for the year and then taking the minimum values of the categorical income ranges (e.g., \$20,000–\$24,999) to identify households that are likely to have incomes above and below 185 percent of the poverty threshold in December. In practice, the screening thresholds generally capture levels of income-to-poverty close to 200 percent of the poverty threshold. In this way, more households are screened into the food security survey module based on income categories than would be based on poverty thresholds alone.

Table 1

## Summary statistics for the U.S. military and civilian adult samples, 2022

Variable	Military		Civilian adults			
	Mean	Standard error	Unadjusted		Adjusted	
			Mean	Standard error	Mean	Standard error
Sex						
Female	0.173	0.002	0.426***	0.005	0.173	0.014
Male	0.827	0.002	0.574***	0.005	0.827	0.014
Age						
17 to 19 years old	0.061	0.004	0.002***	0.000	0.061	0.026
20 to 22 years old	0.190	0.006	0.016***	0.001	0.190	0.043
23 to 25 years old	0.170	0.006	0.050***	0.002	0.170	0.017
26 to 28 years old	0.140	0.005	0.064***	0.003	0.140	0.014
29 to 31 years old	0.118	0.004	0.075***	0.003	0.118	0.012
32 to 34 years old	0.092	0.003	0.087	0.003	0.092	0.009
35 to 37 years old	0.087	0.003	0.084	0.003	0.087	0.008
38 to 40 years old	0.063	0.002	0.075***	0.003	0.063	0.007
41 to 43 years old	0.037	0.002	0.080***	0.003	0.037	0.003
44 to 46 years old	0.021	0.001	0.069***	0.003	0.021	0.002
47 to 49 years old	0.011	0.001	0.071***	0.003	0.011	0.001
50 to 65 years old	0.010	0.001	0.326***	0.005	0.010	0.001
Race and ethnicity						
White, non-Hispanic	0.544	0.007	0.634***	0.005	0.544	0.031
Black, non-Hispanic	0.127	0.005	0.128	0.004	0.127	0.025
Other race, non-Hispanic	0.129	0.005	0.097***	0.003	0.129	0.013
Hispanic	0.199	0.006	0.141***	0.004	0.199	0.018
Marital status						
Married	0.588	0.006	0.502***	0.005	0.588	0.031
Unmarried	0.412	0.006	0.498***	0.005	0.412	0.031

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Variable	Civilian adults					
	Military		Unadjusted		Adjusted	
	Mean	Standard error	Mean	Standard error	Mean	Standard error
Parental status						
At least one child	0.421	0.006	0.400*	0.005	0.421	0.030
No child	0.579	0.006	0.600*	0.005	0.579	0.030
Number of children by age						
0 to 5 years old	0.379	0.009	0.205***	0.005	0.379	0.033
6 to 13 years old	0.340	0.008	0.361	0.008	0.340	0.033
14 to 18 years old	0.120	0.004	0.202***	0.005	0.120	0.015
Educational attainment						
High school degree	0.263	0.006	0.210***	0.004	0.263	0.024
Some college	0.446	0.007	0.271***	0.005	0.446	0.035
College degree	0.179	0.004	0.317***	0.005	0.179	0.014
Professional degree	0.112	0.002	0.203***	0.004	0.112	0.010
Spouse's labor force participation status						
Employed	0.359	0.006	0.397***	0.005	0.359	0.025
Unemployed	0.035	0.002	0.008***	0.001	0.035	0.010
Not in labor force	0.194	0.005	0.097***	0.003	0.194	0.041
Household income-to-poverty ratio						
Less than 250 percent of FPL <sup>a</sup>	0.156	0.005	0.241***	0.004	0.156	0.015
250 to 500 percent of FPL	0.338	0.007	0.359*	0.005	0.338	0.025
500 to 750 percent of FPL	0.210	0.005	0.263***	0.004	0.210	0.025
At least 750 percent of FPL	0.296	0.005	0.138***	0.004	0.296	0.039

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Variable	Civilian adults					
	Military		Unadjusted		Adjusted	
	Mean	Standard error	Mean	Standard error	Mean	Standard error
Region						
Living in Northeast	0.039	0.003	0.162***	0.004	0.039	0.004
Living in South	0.524	0.007	0.384***	0.005	0.524	0.033
Living in Midwest	0.074	0.004	0.230***	0.004	0.074	0.006
Living in West	0.363	0.007	0.223***	0.004	0.363	0.036
Number of adult respondents	9,253		12,613		12,613	

\*FPL = Federal poverty line. The Federal poverty line was \$27,479 for a family of four (two adults and two children) in 2021 and \$29,678 in 2022.

Note: Means and standard errors for the military and civilian unadjusted population statistics were estimated using weighted data for military personnel and civilian adults from the 2022 Status of Forces Survey of Active Duty Members and Current Population Survey Food Security Supplement, respectively. Means and standard errors for the civilian adjusted population statistics were estimated using weights adjusted through iterative proportional fitting. Statistical differences from the military population are indicated by

\* Significant at the 0.05 level.

\*\* Significant at the 0.01 level.

\*\*\* Significant at the 0.001 level.

The civilian adult population consists of adults who are between the ages of 17 and 65, have at least a high school diploma or equivalent level of education, are employed full time, and are not serving in the military on active duty. Spouse's employment status is calculated only for service members that indicate they are married and "Employed spouse" is the reference category. In addition, the civilian adult population is adjusted to match the military population based on sex, age, race and ethnicity, marital status, parental status, education attainment, individual and spousal employment status, household income, and region of residence.

The military population consists of service members stationed in the continental United States.

Source: USDA, Economic Research Service using data from U.S. Department of War, Office of People Analytics, Status of Forces-Active Duty Members and U.S. Department of Commerce, Bureau of the Census, Current Population Survey Food Security Supplement.

Table 1 displays economic and demographic characteristics of the military sample as well as characteristics of the civilian sample both before and after adjusting the demographic profile to match the military sample. As shown in table 1, there exist considerable demographic and economic differences between active duty service members and civilian adults before the iterative proportional fitting process is completed. However, these differences are no longer present after the remaining characteristics in the demographic profiles of the service members and civilian adults are matched using the variables listed in table 1.

## Predicting the Probability of Food-Affordability and Acquisition Problems

The objective of this report is to estimate potential changes to military food insecurity prevalence estimates by simulating a scenario where active duty service members are subject to a set of preliminary food security screening questions not used in the SOFS-A but used in the CPS-FSS. The potential impact of preliminary screening on military food security statistics was simulated by developing a model based on the adjusted civilian adult sample and then applying that model to the military population to predict whether a service member experienced food-affordability or acquisition

issues. A logistic model was used to predict the likelihood that civilian adults, who are economically and demographically similar to service members, report any food-affordability or acquisition problems. The explanatory variables used in this model are those listed in table 1 and are found in both the CPS-FSS and SOFS-A data. The variables included are ones previous studies have identified as economic and social risk factors that contribute to food insecurity, such as employment and household income (Gundersen et al., 2014) as well as education, marital status, and region (Rabbitt et al., 2024).

Equation (1) is the civilian adjusted, observed model used to generate coefficients that explain the relationship between respondent characteristics and the food-affordability and acquisition problems determined by the two preliminary food-affordability and acquisition screener questions:

$$\ln\left(\frac{P(Y_c)}{1-P(Y_c)}\right) = \alpha_c + \beta_c X_c + \varepsilon_c \quad (1)$$

$$Y_c = \begin{cases} 1, & \text{if a food-affordability problem exists} \\ 1, & \text{if a food-acquisition problem exists} \\ 0, & \text{if no food-affordability or acquisition problems exist} \end{cases}$$

In this logistic model,  $Y_c$  is a binary value based on affirmative responses to the screener questions indicating that food-affordability or acquisitions problems exist and  $X_c$  is a vector of economic and demographic variables for a subset of the civilian sample,  $c$ , that has been adjusted to match the military sample. The civilian model's coefficients are then used to predict the probability that military respondents,  $m$ , are subject to food-affordability or acquisition problems based on their own economic and demographic characteristics,  $X_m$ . Equation (2) is the military simulation model:

$$P(\hat{Y}_m) = \hat{\alpha}_c + \hat{\beta}_c X_m \quad (2)$$

Next, a service member's predicted probability of experiencing any of these problems,  $P(\hat{Y}_m)$ , is multiplied by the service member's food security status based on their recorded responses to the food insecurity questions from the SOFS-A. Those values are then used to calculate the expected value of food insecurity prevalence for all active duty service members, as seen in equation (3):

$$E(FI) = \sum_m P(\hat{Y}_m) * FI_m \quad (3)$$

If a service member's household income is below 185 percent of the Federal poverty line, its predicted probability of experiencing food-affordability or acquisition issues,  $P(\hat{Y}_m)$ , is set to one because the service member was screened into the food security survey module.

## Results

Table 2 provides the average predicted probabilities of the logistic model, calculated with civilian data to understand the relationship between household characteristics and food security preliminary screening outcomes based on food-affordability and -acquisition responses. The predicted coefficients (table 2, second column) that are the source of the average predicted probabilities (table 2, third column) are used to simulate the predicted probability of food-affordability and acquisition problems among active duty service members with the same characteristics as the adult civilian sample.<sup>14</sup> Average predicted probabilities are presented in the table because they are easier to interpret since they represent the estimated change in the predicted probability of experiencing food-affordability or acquisition problems. Based on these results, service members are significantly more likely to be screened into the SOFS-A food security survey module if they are younger, have incomes less than 250 percent or from 250 to 500 percent of the Federal poverty line, their highest level of education achieved is a high school degree (or equivalent) or some college, or if their spouse is unemployed.

Table 2

**Estimated coefficients and average predicted probabilities from a logistic model of the probability of experiencing food-affordability and acquisition problems among civilian adults in 2022**

Variables	Probability of a food-affordability or acquisition problem	
	Coefficients	Average predicted probabilities
Age of respondent	0.243** (0.079)	0.029** (0.009)
Age of respondent, squared	-0.003** (0.001)	-0.000** (0.000)
Female respondent	0.205 (0.191)	0.025 (0.024)
Household income-to-poverty ratio categories		
Less than 250 percent of FPL <sup>a</sup>	21.567*** (2.570)	0.824*** (0.011)
250 to 500 percent of FPL	3.781*** (0.774)	0.471*** (0.064)
500 to 750 percent of FPL	0.486 (1.702)	0.061 (0.223)
Household income-to-poverty linear spline		
Less than 250 percent of FPL X HHINCPV <sup>b</sup>	-8.332*** (1.190)	-1.001*** (0.144)

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<sup>14</sup> In analyses that were not shown, we examined whether accounting for the additional source of uncertainty in the model parameters estimates would impact the overall findings of the report. Bootstrapping with 5,000 repetitions was used and the results were qualitatively similar. However, the standard errors that accounted for this additional source of uncertainty were moderately larger.

Variables	Probability of a food-affordability or acquisition problem	
	Coefficients	Average predicted probabilities
250 to 500 percent of FPL X HHINCPV <sup>b</sup>	-0.640*** (0.190)	-0.077*** (0.023)
500 to 750 percent of FPL X HHINCPV <sup>b</sup>	0.023 (0.271)	0.003 (0.033)
Race and ethnicity of respondent		
Black	-0.539 (0.305)	-0.059 (0.030)
Other race	-0.216 (0.219)	-0.025 (0.025)
Hispanic	0.175 (0.258)	0.022 (0.033)
Married respondent	-0.496* (0.199)	-0.061* (0.025)
At least one child in household	-0.229 (0.318)	-0.027 (0.037)
Number of children in household by age		
0 to 5 years old	-0.135 (0.199)	-0.016 (0.024)
6 to 13 years old	-0.103 (0.143)	-0.012 (0.017)
14 to 18 years old	0.038 (0.175)	0.005 (0.021)
Respondents' educational attainment		
High school degree	0.967** (0.319)	0.131** (0.049)
Some college	0.675* (0.269)	0.082* (0.034)
College degree	0.362 (0.252)	0.045 (0.033)
Spouse's labor force participation status		
Unemployed	1.461** (0.496)	0.227* (0.090)
Not in labor force	-0.072 (0.307)	-0.009 (0.036)
Region of residence		
Northeast	0.009 (0.249)	0.001 (0.030)

Variables	Probability of a food-affordability or acquisition problem	
	Coefficients	Average predicted probabilities
South	-0.021 (0.202)	-0.003 (0.024)
Midwest	-0.059 (0.256)	-0.007 (0.030)
Mean of dependent variable		0.295 (0.023)
Number of adult respondents		12,613

<sup>a</sup>FPL = Federal poverty line. The Federal poverty line was \$27,479 for a family of four (two adults and two children) in 2021 and \$29,678 in 2022.

<sup>b</sup>Total household income, relative to the Federal poverty line.

Note: Coefficients, average predicted probabilities and standard errors, in parenthesis, were estimated using weighted data for civilian adults from the 2022 Current Population Survey Food Security Supplement. Statistical significance for the average predicted probabilities is indicated by

\* Significant at the 0.05 level.

\*\* Significant at the 0.01 level.

\*\*\* Significant at the 0.001 level.

The civilian adult population for the logistic model estimation consists of adults who are between the ages of 17 and 65, have at least a high school diploma or equivalent level of education, are employed full time, and are not serving in the military on active duty. Spouse's employment status is calculated only for service members that indicate they are married and "Employed spouse" is the reference category. In addition, the civilian adult population is adjusted to match the military population based on sex, age, race and ethnicity, marital status, parental status, education attainment, individual and spousal employment status, household income, and region of residence.

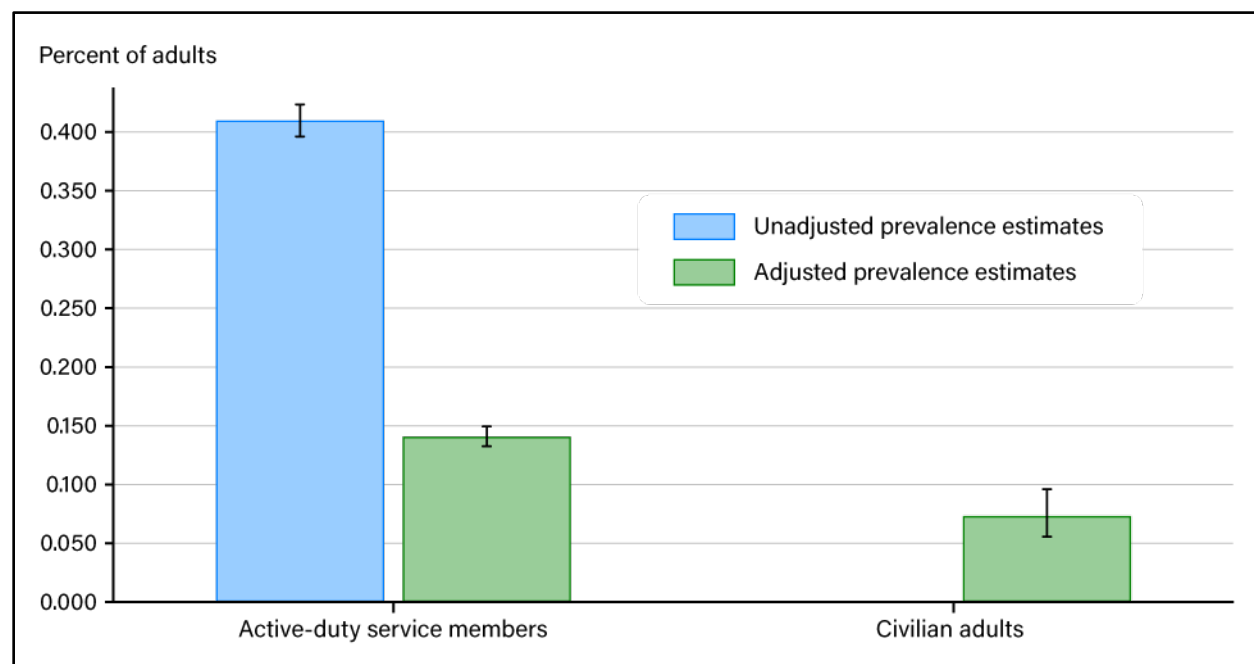
The reference groups for respondents' educational attainment and region of residence are professional degree and the West, respectively.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census, Current Population Survey Food Security Supplement.

Figure 3 depicts the outcome of the simulation analysis, specifically, showing how food insecurity prevalence estimates for active duty service members would be impacted by the implementation of preliminary food security screening procedures in the SOFS-A. In 2022, 41.0 percent of active duty service members are estimated to have experienced food insecurity at some point in the last 12 months based on the observed SOFS-A data that does not include any food security screening procedures. The estimated prevalence of food insecurity for active duty service members in 2022 decreases to 14.1 percent after accounting for the potential impact of including preliminary food security screening procedures in the SOFS-A.

Figure 3

### Prevalence of food insecurity for the military and civilian adult populations under different methodological approaches



Note: The prevalence of food insecurity was estimated using weighted survey data. The civilian adult statistics are adjusted to be equivalent to the observed economic and demographic profile of active duty service members. Statistics for service members are adjusted to simulate the impact of implementing screening in the food security survey module. The military statistics are based on service members stationed in the continental United States.

Source: USDA, Economic Research Service using data from U.S. Department of War, Office of People Analytics, Status of Forces Active Duty Members and U.S. Department of Commerce, Bureau of the Census, Current Population Survey Food Security Supplement.

Similarly, the estimated prevalence of very low food security among active duty service members (table 3) in 2022 decreases from 20.2 percent to 6.8 percent. The simulation analysis shows that in 2022, active duty service members were just as likely as civilian adults to live in households with incomes above 185 percent of the Federal poverty line (86.3 percent and 87.5 percent, not significantly different; table 3). However, active duty service members with household incomes above 185 percent of the Federal poverty line would likely report experiencing food-affordability and acquisition problems at a lower rate (17.2 percent) than that observed for civilian adults at the same income level (19.8 percent, significantly different at the 0.05 level; table 3), leading them to be screened out of the food security survey module more often (82.8 percent, significantly different from 80.2 percent).

Table 3

**Observed and simulated food security survey module screening in the Status of Forces Survey of Active Duty Members (SOFS-A) and Current Population Survey Food Security Supplement (CPS-FSS), 2022**

Variable	Active duty military adults		Civilian adults
	Observed	Simulated screening	Observed
All adult respondents			
Food insecure	0.410*** (0.007)	0.141*** (0.004)	0.073 (0.010)
Very low food secure	0.202*** (0.006)	0.068*** (0.003)	0.026 (0.007)
Household income-to-poverty ratio			
Under 185 percent	0.137 (0.005)	0.137 (0.005)	0.125 (0.014)
Food-affordability or acquisition problems <sup>a</sup>		0.990** (0.000)	0.973 (0.006)
No food-affordability or acquisition problems <sup>a</sup>		0.010** (0.000)	0.027 (0.006)
Screened into module		1.000	1.000
Screened out of module		0.000	0.000
Prevalence of food insecurity	0.507*** (0.000)	0.507*** (0.000)	0.260 (0.047)
Prevalence of very low food security	0.223** (0.000)	0.223** (0.000)	0.097 (0.039)

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Variable	Active duty military adults		Civilian adults
	Observed	Simulated screening	Observed
185 percent and over	0.863 (0.005)	0.863 (0.005)	0.875 (0.014)
Screened into module <sup>b</sup>		0.172* (0.002)	0.198 (0.011)
Screened out of module <sup>b</sup>		0.828* (0.002)	0.802 (0.011)
Prevalence of food insecurity	0.394*** (0.007)	0.082*** (0.002)	0.047 (0.008)
Prevalence of very low food security	0.199*** (0.006)	0.044*** (0.002)	0.015 (0.005)
Number of adult respondents	9,253	9,253	12,613

<sup>a</sup>Reports of food-affordability and acquisition problems are estimated for military service members using the estimated coefficients from a logistic model of food-affordability and acquisition problems based on the civilian adult sample.

<sup>b</sup>Screening rates for the food security survey module are estimated for military service members using the estimated coefficients from a logistic model of screening patterns based on the civilian adult sample.

Note: Means and standard errors, in parenthesis, were estimated using weighted data for military personnel and civilian adults from the 2022 Status of Forces Survey of Active Duty Members and 2022 Current Population Survey Food Security Supplement, respectively. Statistical differences from the civilian adult population are indicated by

\* Significant at the 0.05 level.

\*\* Significant at the 0.01 level.

\*\*\* Significant at the 0.001 level.

The civilian adult population consists of adults who are between the ages of 17 and 65, have at least a high school diploma or equivalent level of education, are employed full time, and are not serving in the military on active duty. In addition, the civilian adult population is adjusted to match the military population based on sex, age, race and ethnicity, marital status, parental status, education attainment, individual and spousal employment status, household income, and region of residence.

Source: USDA, Economic Research Service using data from U.S. Department of War, Office of People Analytics, Status of Forces-Active Duty Members and U.S. Department of Commerce, Bureau of the Census, Current Population Survey Food Security Supplement.

Table 3 also demonstrates the simulated impact of preliminary food security screening on the prevalence of food insecurity and very low food security statistics for service members. Prior to making any adjustments to service members' food security measures based on the simulated food security screening procedures, active duty service members with household incomes greater than 185 percent of the Federal poverty line were more likely to experience food insecurity than similar civilian adults in 2022 (39.4 percent, significantly higher than 4.7 percent; table 3). Higher income service members remained significantly more likely to experience food insecurity after accounting for the simulated food security screening procedures, but the difference is less pronounced (8.2 percent versus 4.7 percent for civilian adults). This difference may be explained by the fact that service members were more likely to be under 31 years old, have at least one child, and have an unemployed spouse while less likely to have a college or professional degree (table 1). Similarly, for the more severe form of food insecurity (very low food security), higher income active duty service members were significantly more likely to be classified as very low food secure without an adjustment for the differences in screening procedures (19.9 percent versus 1.5 percent for civilian adults; table 3). This is

still the case after making these adjustments, but the prevalence of very low food security for higher income active duty service members decreased to 4.4 percent. The resulting difference in prevalence is likely the result of the sociodemographic differences mentioned previously (i.e., younger, less educated individuals with children and an unemployed spouse).

Table 4

**Detailed food security measures based on the observed and simulated screening procedures for the Status of Forces Survey of Active Duty Members (SOFS-A) Food Security Survey Module, 2022**

Variable	Active duty military adults		Civilian adults
	Observed	Simulated screening	Observed
Count of affirmed food insecurity questions			
0	0.488*** (0.007)	0.832*** (0.005)	0.883 (0.013)
1	0.103*** (0.004)	0.027* (0.003)	0.044 (0.008)
2	0.100*** (0.004)	0.032 (0.003)	0.028 (0.006)
3	0.054*** (0.003)	0.019** (0.002)	0.010 (0.002)
4	0.053*** (0.003)	0.020* (0.002)	0.010 (0.003)
5	0.060*** (0.003)	0.020 (0.002)	0.012 (0.005)
6	0.142*** (0.005)	0.050*** (0.003)	0.013 (0.005)
Number of adult respondents	9,253	9,253	12,613

Note: Means and standard errors, in parenthesis, were estimated using weighted data for military personnel and civilian adults from the 2022 Status of Forces Survey of Active Duty Members and 2022 Current Population Survey Food Security Supplement, respectively. Statistical differences from the civilian adult population are indicated by

\* Significant at the 0.05 level.

\*\* Significant at the 0.01 level.

\*\*\* Significant at the 0.001 level.

The civilian adult population consists of adults who are between the ages of 17 and 65, have at least a high school diploma or equivalent level of education, are employed full time, and are not serving in the military on active duty. In addition, the civilian adult population is adjusted to match the military population based on sex, age, race and ethnicity, marital status, parental status, education attainment, individual and spousal employment status, household income, and region of residence.

Food security status classifications are based on the count of affirmed food insecurity questions (i.e., raw score). A household is classified as highly food secure if the respondent affirmed none of the questions, marginally food secure if the respondent affirmed one question, low food secure if the respondent affirmed 2–4 questions, and very low food secure if the respondent affirmed 5–6 questions. Food security includes high and marginal food security and food insecurity includes low and very low food security.

Source: USDA, Economic Research Service using data from U.S. Department of War, Office of People Analytics, Status of Forces-Active Duty Members and U.S. Department of Commerce, Bureau of the Census, Current Population Survey Food Security Supplement.

Up to this point, the results have focused on summary measures of food insecurity among service members and civilians. These summary measures, while useful for characterizing meaningful ranges of the severity of food insecurity experienced by households, do not capture more nuanced gradations in the severity of food insecurity. Focusing on the raw score, which is the number of affirmative responses to the food-insecurity questions, allows us to examine the potential implications of a SOFS-A preliminary food security screening procedure on active duty service members' response patterns to the food insecurity questions and food security status classifications (i.e., high, marginal, low, and very low food security) beyond binary food insecurity and very low food security status. Table 4 shows the prevalence by raw scores among service member and civilian adult respondents. First, comparisons of the observed and simulated screening statistics for service members demonstrate that detailed food security status classifications could be affected by the inclusion of a preliminary food security screening procedure in the SOFS-A. The results show that service members would be less likely than their civilian counterparts to be classified as either highly food secure (no indications of food insecurity; raw score group 0) or marginally food secure (raw score group 1) and more likely to be classified as low (raw score groups 2–4) or very low food secure (raw score groups 5–6) based on the simulated raw scores. However, the prevalence of food insecurity among active duty service members would decrease. The largest decreases in the prevalence would be for those with marginal food security (73.8 percent), followed by those with low food security (65.7 percent), and very low food security (65.3 percent). Second, these results show that the simulated military food security scores differ significantly from the adjusted civilian scores in most cases. The military population had a lower prevalence of respondents affirming zero or one question and a higher prevalence among those affirming three, four, or six questions.

Table 5

**Difference in observed and simulated preliminary screening for the six-item Food Security Survey raw score and food security status distributions**

Raw score	Food security status	Observed	Simulated screening	Difference
0	High or marginal food security	5,648	8,292	2,644
1		826	160	-666
2	Low food security	760	181	-579
3		383	110	-273
4		346	101	-245
5	Very low food security	410	124	-286
6		880	285	-595
Number of service member respondents		9,253	9,253	0

Note: The number of service member respondents was estimated using unweighted data for military personnel from the 2022 Status of Forces Survey of Active Duty Members.

Food security status classifications are based on the count of affirmed food insecurity questions (i.e., raw score). A household is classified as highly food secure if the respondent affirmed none of the questions, marginally food secure if the respondent affirmed one question, low food secure if the respondent affirmed 2–4 questions, and very low food secure if the respondent affirmed 5–6 questions. Food security includes high and marginal food security and food insecurity includes low and very low food security.

Source: USDA, Economic Research Service using data from U.S. Department of War, Office of People Analytics, Status of Forces-Active Duty Members.

The purpose of table 5 is to show how many military respondents to the 2022 SOFS-A would potentially be impacted by changes to the food security screening procedures. According to the results, 2,644 service members, or about 28.6 percent, would have likely had their food security status changed if the SOFS-A used a preliminary food security screening procedure. This included about 1,978 service members (21.4 percent) who were classified as food insecure (low or very low food secure) under the current form of the SOFS-A with no food security screening procedures, but would likely be screened out of the SOFS-A food security survey module and classified as food secure based on their total household income and predicted responses to the food-affordability and acquisition questions (table 5, last column for raw scores 2–6).

Service members with low food security were the most likely to be impacted by the potential implementation of food security screening procedures in the SOFS-A. Households with low food security report reduced quality, variety, or desirability of diet, but little to no indication of reduced food intake. About 1,097 service members classified as having low food security would likely have had their food security status changed if the SOFS-A used a preliminary food security screening procedure (table 5, last column for raw scores 2–4). These service members represent about 41.5 percent of all 2,644 service members likely impacted by screening procedures and the majority (55.5 percent) of the food-insecure service members likely screened out of the food security survey module if the SOFS-A used a preliminary screening procedure (1,978 service members screened out with indication of low or very low food security).

## Discussion and Conclusion

This report set out to simulate the potential implications of adding the CPS-FSS preliminary food security screening procedure to the SOFS-A with methods for producing food security statistics for active duty service members that more closely align with similar statistics produced for civilians. To accomplish this, data from the 2022 SOFS-A and CPS-FSS were used to develop a predictive logistic model of the likelihood that higher-income service members—those with incomes above 185 percent of the Federal poverty line—experience food-affordability or acquisition problems. The estimated probability of experiencing food-affordability or acquisition problems for higher-income service members is based on this predictive model while all lower-income service members are assumed to likely experience these problems and are screened into the food security survey module under the CPS-FSS screening procedures. We weight the probabilistic simulated and observed military food security outcomes, for higher- and lower-income service members, respectively, to estimate the food insecurity prevalence among all active duty service members.

The findings suggest that approximately 82.8 percent of higher-income service members would likely be screened out of the food security survey module should DoW incorporate preliminary screening procedures in the SOFS-A. This change would have a measurable impact on food security measurement and reporting for the military population but follows the original intent of the optional screener questions to reduce respondent burden on households with incomes above 185 percent of the Federal poverty line (USDA, ERS, 2012). First, a simulation of the addition of food security

screening procedures in the SOFS-A points to decreases in the measured prevalences of food insecurity and very low food security among service members when compared to the prevalences observed with no screening. In 2022, approximately two in five (41.0 percent) service members reported living in food-insecure households in the last 12 months. However, after accounting for the potential effects of the CPS-FSS food security screening procedures, we found the prevalence of food insecurity among service members in 2022 could be as low as one in seven (14.1 percent), a prevalence rate closer to the 2022 prevalence for all U.S. civilian households (12.8 percent) (Rabbitt et al., 2023); although still statistically higher than the comparable civilian adult sample (7.3 percent). Similarly, the prevalence of very low food security among service members decreased from 20.2 percent to 6.8 percent in 2022. Just over a quarter of service members in the 2022 SOFS-A sample (28.6 percent of 2,644 service members) were simulated to have their food security status changed because of the food security screening procedure. Three-fourths (1,978 service members) of those who are simulated to have their food security status changed under the screening procedure were originally classified as food insecure, of which 44.5 percent were originally classified as very low food secure (881 service members). The remaining one-fourth (666 service members) who had their food security status changed under the simulated screening procedure were originally classified as marginally food secure, a less severe form of food insecurity where households experience problems or anxiety about accessing adequate food, but the quality, variety, and quantity of their food intake were not substantially reduced.

Second, the findings of this report require us to reconsider whether service members and their dependents are at a greater risk for experiencing food insecurity relative to their civilian peers. A recent report by Rabbitt and Beymer (2024) estimated that service members and their dependents were 2.5 times more likely to live in a food-insecure household than socioeconomically similar civilians. However, that analysis was not able to take advantage of the recent introduction of information about household income in the 2022 SOFS-A and so could not account for differences in food security screening procedures. Including household income information allowed this research to better match civilian adults to their military counterparts based on their economic resources while also simulating the impact of food security screening in the SOFS-A. Similar to Rabbitt and Beymer (2024), our findings suggest that active duty service members and their dependents (41.0 percent) were 5.6 times more likely to live in a food-insecure household than their civilian peers (7.3 percent) in 2022. After accounting for the potential effects of food security screening in the SOFS-A, the prevalence of food insecurity among active duty service members and their dependents decreased to 14.1 percent, although still statistically higher (1.9 times more likely to live in a food-insecure household) than that for demographically similar civilians in 2022 (7.3 percent).

As for generalizability, the study highlights the variation in screening procedures as a methodological difference in food security surveys that leads to different food security prevalence rates. We show that the study's results can be generalized to the military population but also find the difference in screened and unscreened prevalence rates can be generalized to other food security studies that seek to harmonize prevalence rates with simulation analysis. Past USDA research (Ohls et al., 2001) adjusted and validated a common food security screening procedure to ensure that food security statistics can be compared and, ultimately, generalized to populations of interest.

There are several limitations to the analyses in this report. First, the findings in this report are dependent upon the assumptions underlying the reweighting procedure, predictive model, and steps made to estimate service members' food security statuses based on the simulated food security screening procedure. There may be omitted variable bias if additional unobservable explanatory variables exist that result in better matches between the service members and civilian adults or more completely explain the likelihood of experiencing food-affordability or acquisition problems. Second, the food security data used in these analyses for service members and civilian adults rely on different survey methods for collection (e.g., population of interest, sampling framework, survey modality, survey questions using external and internal screening procedures, etc.). The SOFS-A is an online survey while the CPS-FSS uses telephone and in-person interviews to collect food security data. While there may be unique implications for food security measurement that differ based on these survey modes, Ahn et al. (2020) show that under certain assumptions online surveys can be used to create food insecurity prevalence estimates that are similar to those collected using national surveys, such as the CPS-FSS. Third, there are also temporal differences in the administration of these surveys, with the SOFS-A being fielded over several months in the fall while the CPS-FSS is typically fielded in the second week of December. As a result, seasonality in the reporting of food-insecurity behaviors and conditions may impact the comparability of these food insecurity prevalence estimates. Fourth, geographic information below the region level was not available for military members and, therefore, economic conditions that vary across States could not be accounted for in the analysis. State-level economic conditions and policy differences could potentially impact a military household's access to employment, affordable housing, food retail stores, food assistance programs, and other resources that would affect household resources for food. Finally, weighted response rates are lower for the SOFS-A than the CPS-FSS (13.8 percent versus 70.4 percent<sup>15</sup> in 2022); therefore, nonresponse bias may also impact the comparability of food insecurity statistics constructed using these datasets. Respondents to military surveys are disproportionately older and more senior (McGrath et al., 2019), characteristics less likely to be associated with food insecurity (Rabbitt & Beymer, 2024). DoW produces survey weights to correct for biases associated with known respondent characteristics, but there exists the possibility that response rates are correlated with unobservable traits that could be related to food insecurity.

This study provides insights into possible areas of future research. There are opportunities to test the robustness of military food security outcomes with various quantitative techniques. Most simply, sensitivity analysis of our simulation methods might include a further examination of predicted probabilities to determine a respondent's problems with food access or acquisition or their food security status. Machine learning classification, as a more advanced technique, might use civilian data for training algorithms to predict food security prevalence among active duty service members. Regardless of the analytical technique used, this technical exercise highlights that optional screener questions create a lower bound in food insecurity prevalence estimates. In these estimates, households with income above 185 percent of the Federal poverty line are found to be food secure during the implementation of screening procedures when these households, in fact, respond that they experience multiple indications of food insecurity. Thus, future research could highlight the degree to

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<sup>15</sup> Monthly response rates for the CPS are available from U.S. Department of Labor, Bureau of Labor Statistics. Response rates for the 2022 SOFS-A were calculated by U.S. Department of War.

which screening procedures lead to underreporting of food insecurity in all survey modules that use screening procedures, including the CPS-FSS. This could be achieved with a split panel data collection with and without screening procedures in any food security survey, including SOFS-A. Beyond the technical aspects of a novel application of the statistical approach, there are opportunities to explore the variation in demographics between military and civilian populations to understand how these predictive factors influence differences in populations' food security prevalence rates.

The findings in the report demonstrate the potential implications of including food security screening procedures in food security data collections. While including these procedures in any data collection increases the comparability of any resulting food security statistics with national statistics based on the CPS-FSS, this is not without a potential loss of information on the food security of respondents and their household members. The current report findings, for example, demonstrate that roughly a quarter of service members in the 2022 SOFS-A (28.6 percent or 2,644 of 9,253 total service members) would likely have been screened out of the food security survey module if the survey had included the CPS-FSS preliminary screening procedures. Therefore, a tradeoff exists between the comparability of food security measures based on differing data collection methods and the potential policy analysis and research utility of the data.

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