State/Territorial Older Americans Act Plans on Aging and Inclusion of Malnutrition-Related Conditions and Interventions Impacting Healthy Aging

Mary Beth Arensberg (mary.arensberg@abbott.com)
Abbott Nutrition https://orcid.org/0000-0002-9825-2251
Jaime J. Gahche
National Institutes of Health
Johanna T. Dwyer
National Institutes of Health
Adam Mosey
ADvancing States
Damon Terzaghi
ADvancing States

Research Article

Keywords: Older Americans Act (OAA) aging plans, malnutrition, sarcopenia, frailty, obesity, older adults, nutrition

Posted Date: February 17th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1039031/v1

Abstract

Background

to meet the challenges of an aging population and improve public health it is imperative to reduce factors that decrease independence and increase morbidity. Malnutrition (particularly protein-energy undernutrition), sarcopenia, frailty, and obesity all result in disability but are potentially changeable. The purpose of this study was to determine whether state/territorial plans on aging for Older Americans Act (OAA) programs include nutrition-related conditions/interventions that could impact healthy aging.

Methods

OAA aging plans available on the ADvancing States website in February 2021 (n=52) were searched for number of mentions of defined nutrition terms including malnutrition, sarcopenia, frailty, obesity, and if terms were included in plans' goals/objectives, strategies/actions or solely in the narrative.

Results

33% of plans mentioned malnutrition; 8% (goals/objectives), 15% (strategies/actions). 62% mentioned frailty; 6% (goals/objectives), 15% (strategies/actions). None mentioned sarcopenia. In contrast 21% mentioned obesity; 2% (goals/objectives), 2% (strategies/actions). Nutrition intervention mentions were nearly nil. There were no significant differences in frequency of term mentions by region or by states with higher % older adults or obese adults. Malnutrition, sarcopenia, frailty, and obesity adversely affect healthy aging and contribute to disability/poorer health outcomes but are mentioned infrequently in state/territorial plans on aging.

Conclusions

the incorporation of OAA nutrition programming to include addressing malnutrition in 2022 plans can best be realized by clearly specifying definitions of malnutrition-related conditions and incorporating them among the measurable goals/objectives, defined strategies/actions, and outcomes.

Background

Americans are living increasingly longer. By the end of this decade 20% of the United States (US) population will be 65 years or older. Those 85+ years are the fastest growing age group [1]. Although many older adults are healthier than ever before, many others are afflicted with age-related conditions resulting in difficulties in carrying out activities of daily living [2]. At the same time, even when older adults' physical/cognitive declines make it difficult to live independently, they want to "age in place" at home rather than in an institution [3]. The COVID-19 pandemic has further reinforced these beliefs [4].

Powerful economic incentives exist for helping older adults to successfully age in place. Institutional care/other expenses for those aged 65+ already account for over 2/3rds of mandatory, non-defense federal spending and future percentage increases are unlikely. Additionally, public health providers and policymakers increasingly recognize the importance of social determinants of health and are moving more services from clinical to community settings, even as there are fewer available caregivers [1].

To meet these challenges and improve public health, it is imperative to focus on prevention and reduce factors that increase morbidity and decrease independence. Malnutrition (particularly protein-energy undernutrition), sarcopenia, frailty, and obesity are potentially modifiable conditions that increase disability risk [5–8]. For example, improving nutrition and decreasing weight loss in undernourished individuals can help reduce frailty risk [9]. Chronic disease also increases disability risk. Over 80% of older Americans have at least one chronic disease and older adults with major noncommunicable diseases face earlier and steeper slopes of functional decline and increased disability [2]. Many chronic diseases are associated with dietary risk factors and nutrition-related conditions such as malnutrition, sarcopenia, or obesity [6]. In the US, the community incidence and potential overlaps of malnutrition, sarcopenia, and frailty remain largely unknown, although obesity prevalence is well documented [10, 11], increasing risk for inadequate screening, assessment, and intervention.

Older Americans Act (OAA) programs can help address this public health need. The OAA Title III congregate/home nutrition programs and Title VI nutrition services for older Native Americans are the primary community-based federal nutrition programs supporting older adults, regardless of income. The Dietary Guidelines for Americans (DGA) guide both programs and the 2020 DGAs identified malnutrition, sarcopenia, and frailty as concerns for older adults and obesity as a concern for all adults [12].

Nationally, advocacy groups have called for malnutrition screening in OAA participant surveys and programs as well as for required malnutrition quality measures to assess the value/effectiveness of older adults' healthcare [13]. A 2019 Government Accountability Office report recommended improved oversight of federally-funded OAA meals programs and more focus on older adult nutrition in the 2025 DGAs [14]. The Administration for Community Living (ACL), which administers OAA programs, responded it would build on the 2020-2025 DGAs and continue to update the evidence on older adult nutrition. The 2020 OAA reauthorization [15] made several modifications to OAA titles for nutrition programs and called for greater attention to malnutrition [16]. Reducing malnutrition is now included in the OAA Title III Nutrition Services Program's purpose and malnutrition screening is part of the definition of its disease prevention/health promotion services.

It is unknown how these efforts are being translated into state/territorial, tribal, and local actions and where opportunities exist for preventive strategies. The OAA requires state/territorial units on aging to submit multi-year plans (including intentions for OAA nutrition programs) and the ACL issues regular guidance

directing the plans' focus. This study investigated whether publicly available state/territorial plans on aging, tribal agency grants, and related ACL federal guidance mentioned nutrition-related conditions and interventions that could impact healthy aging, including malnutrition, sarcopenia, frailty, and obesity.

Methods

Study sample

ADvancing States represents the 56 US state/territorial units on aging and disabilities and long-term services/supports directors. Its website provides a map linking to individual state/territorial aging plans [17]. In February 2021, this map was used to access available aging plan documents (50 states, Washington DC, and Guam).

Measures

Search terms for nutrition conditions/interventions potentially having an impact on healthy aging were identified. These defined nutrition terms were nutrition, malnutrition/underweight/undernutrition, sarcopenia, frail/frailty, obesity/overweight, dietary supplements/oral nutrition supplements/meal replacements. Three investigators conducted a review of 5 plans to develop a search process for defined nutrition terms within the aging plan documents. Specifically, after they independently searched the same 5 plans, results were examined, differences were adjudicated, and a consistent search approach was confirmed. Final analyses were completed by April 2021; the same 3 investigators independently reviewed 1/3rd of alphabetically ordered remaining 47 plans, with overlap for 19% of plans (2 investigators reviewed the same plan). The investigators used a simple electronic search function to search each aging plan document, recording the overall numeric frequency of mentions of the defined nutrition terms as well as frequency of mentions in any goals/objectives and/or strategies/actions.

In February 2021, the 3 investigators also searched ACL's guidance at that time for state/territorial units on aging plans [18] and Title VI grants [19, 20] for mentions of the defined nutrition terms. Title VI grants were not publicly available and could not be searched.

Statistical analysis

Statistical analyses were conducted using SAS 9.4 (SAS Institute, Inc, Cary, NC). The percentage of states/territories mentioning at least one of the defined terms was calculated. Means, standard deviations and quartiles were estimated for each of the defined terms. Finally, the mean number of mentions was compared among states with lower and higher percentages of older adults and obesity in their population. "Lower" and "higher" were defined by the lower 50th percentile compared to the highest percentile of older adults or obese adults as a percentage of the state's population. Differences between groups were tested using a univariate t statistic and all significant differences reported were statistically significant at the $p < 0.05$ significance level.

Results

State/territorial units on aging plans were available for 50 states, the District of Columbia, and 1 territory (Guam) on the ADvancing States website in February 2021. The term *nutrition* was included at least once in all 52 state/territorial aging plans (Figure 1). About 54% of states/territories mentioned it at least once as part of goals/objectives and 87% included it under strategies/actions. In contrast, specific mentions of various aspects of nutritional status were far fewer. Of the 52 state/territorial plans reviewed, 33% mentioned *malnutrition/undernutrition/underweight* at least once; but only 8% of mentions were as part of goals/objectives and 15% as part of strategies/actions. The terms *frailty/frail* were mentioned in 62% of the plans; however, only 6% of mentions were in goals/objectives and 15% in strategies/actions. Furthermore, 21% of the plans mentioned *obesity/overweight* and only 2% mentioned in goals/objectives, and 2% in strategies/actions. There was little mention of interventions *dietary supplements/oral nutrition supplements/dietary supplements* and no plans mentioned *sarcopenia*.

On average, in state/territorial aging plans the mean number of mentions of *nutrition* was relatively high; 31.1 ±23.0 SD, although the number varied greatly from one state to another (Table 1). Fifty percent of plans had 25.5 or more mentions of *nutrition* and 25% of plans had 40.5 or more mentions of *nutrition*. However, most mentions did not single out *nutrition* in goals/objectives (mean 1.8 ±3.3) or strategies/actions (mean 6.6 ±10.1), rather they simply referred to *nutrition* in the verbiage describing more general aspects of the aging plan and its programs. In contrast, none of the terms describing various aspects of nutrition status such as *malnutrition/undernutrition/underweight, sarcopenia, obesity/ overweight* received a mean of even a single mention. Frailty was mentioned on average 2.7 times in aging plans but only in the text, and not in goals/objectives or in strategies/actions.

Table 1

Descriptive statistics for defined nutrition term mentions in 52 US state/territorial unit on aging plans*

Terms searched	Mean	Standard deviation	25th quartile	Median	75th quartile
Nutrition # Overall mentions	31.1	23.0	14.5	25.5	40.5
# mentions in Goal/Objective	1.8	3.3	0.0	1.0	2.0
# mentions in Strategy/Action	6.6	10.1	1.0	4.0	7.0
Malnutrition/undernutrition/underweight # Overall mentions	1.2	3.2	0.0	0.0	1.0
# mentions in Goal/Objective	0.1	0.4	0.0	0.0	0.0
# mentions in Strategy/Action	0.3	1.1	0.0	0.0	0.0
Frailty/frail # Overall mentions	2.7	4.0	0.0	1.0	3.5
# mentions in Goal/Objective	0.1	0.3	0.0	0.0	0.0
# mentions in Strategy/Action	0.2	0.5	0.0	0.0	0.0
Obesity/overweight # Overall mentions	0.4	1.0	0.0	0.0	0.0
# mentions in Goal/Objective	0.0	0.1	0.0	0.0	0.0
# mentions in Strategy/Action	0.1	0.4	0.0	0.0	0.0

*Plans reviewed were those available on the ADvancing States website in February 2021.

Table 2

Mean number defined nutrition term mentions in aging plans by percentile US state population ≥ 65 *

Terms searched	% of the population that is ≥ 65 years of age**	
	≤15.5%	>15.5%
Nutrition # overall mentions	27.4	35.2
Nutrition # mentions in Goal/Objective	1.7	1.9
Nutrition # mentions in Strategy/Action	5.9	7.4
Malnutrition/undernutrition/underweight # overall mentions	1.1	1.2
Malnutrition/undernutrition/underweight # mentions in Goal/Objective	0.1	0.2
Malnutrition/undernutrition/underweight # mentions in Strategy/Action	0.4	0.3
Frailty/frail # overall mentions	2.6	2.8
Frailty/frail # mentions in Goal/Objective	0.1	0.0
Frailty/frail # mentions in Strategy/Action	0.3	0.1
Obesity/overweight # overall mentions	0.5	0.4
Obesity/overweight # mentions in Goal/Objective)	0.0	0.0
Obesity/overweight # mentions in Strategy/Action)	0.1	0.0

*Mentions of defined nutrition terms in 50 US state unit on aging plans by available on the ADvancing States website in February 2021 and grouped by lower, upper 50th percentile of US state population ≥ 65 years of age

**Statistical differences were not found for any terms by % of the population that was ≥ 65 years of age

To test whether states/territories with a large proportion of older persons might give more attention to nutrition, the mean number of mentions for the defined nutrition terms was compared between states with the lowest and highest percentage of older adults in the state's population. *Nutrition* was mentioned on average 27.4 times among states with a lower percentage of older adults compared to 35.2 times among states with a higher percentage of older adults, but the difference was not statistically different. Similarly, no significant differences were found between states with lower compared to higher percentages of

older adults for any of the other defined nutrition terms. No statistically significant differences were evident either between the mean number of mentions for the defined nutrition terms when states that had lower percentages of obesity were compared with those with higher obesity (data not shown).

Figure 2 depicts the term *nutrition* by quartile of mentions. It also indicates the states/territories that had a higher number of mentions of *malnutrition/undernutrition/underweight* anywhere in their aging plans. Higher mentions were defined as ≥ 1 mention compared to 0 mentions for the states as a whole. Only New York, Massachusetts, Utah, and Colorado stood out; their aging plans fell in the top quartile of mentions of *nutrition* among all the states and had higher mentions of *malnutrition/undernutrition/underweight*. No significant differences in the number of mentions or associations were observed for states with higher number of mentions of *nutrition* and *malnutrition/undernutrition/underweight* singly or both terms together, or when evaluated by states grouped regionally.

Federal ACL guidance examined was that available in February 2021, for state/territorial aging plans and Title VI grants to Native Americans. There were no mentions of *malnutrition*, *sarcopenia*, or *obesity* in guidance for either of the programs and *frailty* was mentioned only once in ACL's Title VI guidance.

Discussion

To our knowledge, this is the first study focused on nutrition-related terms described in state/territorial units on aging plans. Nutrition was mentioned frequently in the overall plans, but unexpectedly it was mentioned only infrequently in plans' goals/objectives and strategies/actions. Moreover, nutrition was rarely defined operationally, making it difficult to know whether the term referred to a program description, the type/amount of food provided by OAA programs, or to participants' nutrition status.

There were few mentions of the other nutrition terms searched for, whether they referred specifically to nutrition-related conditions or to possible nutrition interventions. The limited mentions and rare inclusions in goals/objectives or strategies/actions are disappointing but not surprising, because the terms were not explicitly included in ACL's guidance at the time. No statistically significant associations were found between number of term mentions, percent of state populations who were 65+, percent of state populations who were obese, or state's region of the country. This finding suggests the need to more closely link these conditions or interventions to preventive health needs and public health goals.

The results reveal several additional opportunities for both federal and state/territorial agencies to enhance impact of OAA programs on healthy aging. First, provision of operational definitions in future federal guidance for all nutrition-related terms along with strategies and actions associated with them would be helpful. Lack of a clear operational definition for nutrition in ACL guidance may have led to confusion at the state/territorial level and a failure to more frequently include nutrition in state/territorial plan goals/objectives and strategies/actions. Operational definitions are needed for both the goal of maintaining/improving nutrition status of OAA program participants as well as for meeting participants' nutrition needs by serving high quality, healthy food. ACL guidance could assist in providing uniform definitions for various ways nutrition contributes to OAA programs and outcomes. More direct federal guidance on how OAA programs potentially have an impact on nutrition-related conditions is another opportunity for further development. At the time, ACL guidance available on state/territorial aging plans did not explicitly address malnutrition, sarcopenia, frailty, or obesity; all common conditions among older adults [6]. ACL has since moved to include malnutrition in its guidance for state/territorial 2022 plans [21]. This is a positive step, but other nutrition-related conditions/interventions are not addressed. It is still too early to know how ACL's new guidance may influence state/territorial plans. Further, it does not appear ACL has issued any new guidance on Title VI grants.

Second, better prevalence estimates of nutrition-related conditions are necessary. The paucity of information on prevalence of malnutrition, sarcopenia, and frailty among OAA program participants may have partly accounted for their low number of mentions in state/territorial aging plans. The national prevalence of malnutrition among community-living older Americans is unknown, although it may be substantial. A systematic review, meta-analysis and meta-regression of protein-energy malnutrition by region estimated a North American prevalence of 6.1% among community living older adults [22]. Rates of sarcopenia are also not clearly defined in the US; internationally sarcopenia estimates for community-dwelling older adults are 1-29% or greater, depending on definitions used [23]. Similarly, US frailty rates are not tracked; globally frailty community prevalence in older adults can vary significantly from 4-59% [24].

OAA agencies may have assumed all participants were at risk and there was no need for further focus since many older adults exhibit at least one nutrition-related condition. However, better data on prevalence and overlap of malnutrition, sarcopenia, and frailty, as well as obesity among OAA participants are essential because interventions to prevent/treat these conditions vary greatly depending on underlying causes [11]. Failure to screen/direct appropriate interventions to those OAA participants most likely to respond may dilute program effectiveness.

State/territorial units on aging could consider greater integration of screening, assessment, and intervention for these conditions within OAA's network of disease prevention/health promotion services. Both malnutrition and obesity were among the chronic conditions identified in a report on OAA participation's effect on health care utilization, but there was no analysis specific to OAA programs and malnutrition and obesity outcomes; sarcopenia and frailty were not even identified [25]. Technical assistance and additional resource allocation could make this more likely as the aging services network is already stretched thin [26] and even the recent further funding allocated to OAA programs through COVID-19 relief legislation had no additional funding for malnutrition. There is also an important role for ACL's National Resource Center on Nutrition and Aging, including in surveys and in prevalence/outcomes research for nutrition-related conditions.

Third, it may be that the limited mentions of nutrition-related conditions and interventions in plans reflected lack of input by registered dietitian nutritionists (RDNs) at state/territorial-levels. The 2020 OAA reauthorization specified an RDN must federally administer OAA nutrition programs and in the future nutrition's impact on healthy aging will likely be given more attention at the federal level. States/territories could adopt a similar approach by requiring an RDN administer state/territorial OAA nutrition programs.

Fourth, there are opportunities to enhance community awareness and attention to nutrition-related problems among community dwelling older adults, potentially including working closer with state public health and social service agencies. More guidance on/attention to malnutrition, sarcopenia, frailty, and obesity screening, assessment, and interventions in state/territorial aging plans could influence state master plans on aging and cascade down to local agencies' plans. This is of particular concern for 3 states (California, Florida, Texas) where 25% of all older Americans will reside by decade's end, and 7 additional states (Georgia, Illinois, Michigan, New York, North Carolina, Ohio, Pennsylvania) which will account for another 25% of the older adult population [1]. The potential community-level public health need is underscored by a recent county-specific study of malnutrition among older Texans (65+); household poverty status, low food access, low educational level, and rurality were all significantly associated with crude death rates from malnutrition [27].

Fifth, our findings suggest there may be opportunities to help improve nutrition and health equity. Native Americans represent less than 2% of the US population, but nationally have some of the highest rates of food insecurity, poverty, diet-related diseases, and other socioeconomic challenges [28, 29]. Malnutrition, frailty, and the social determinants of nutritional health are areas of particular concern among Native Americans [30, 31]. This provides an area for future development and collaboration at the federal level between ACL and other agencies engaged in nutrition and health services for this population.

Finally, our experience suggests scrutiny of state/territorial units on aging plans may provide opportunities for future public health and prevention research, particularly as OAA programs have been identified as helping community-dwelling older adults age in place [32]. This research could focus on the intersection of nutrition and other areas related to healthy aging and federally funded community programs and services.

Strengths and Limitations

One strength of our study is that, to our knowledge, it is the first to review state/territorial aging plans to identify mentions of specific nutrition terms, including conditions with potential impact on healthy aging. It also provides a benchmark for evaluating state/territorial aging plans and ACL guidance going forward, as 2019 GAO report recommendations, 2020-2025 DGAs, and 2020 OAA Reauthorization provisions become fully implemented.

Our study had several limitations. The method for identifying defined nutrition terms in aging plans was a simple count and may have been subject to error. Yet when investigators initially independently reviewed a small sample of the same aging plans, differences in counts were limited. The use of the ADvancing States website was a logical, publicly available resource. More current aging plans may have been available on state/territorial websites, but a search of these 50+ individual websites was beyond the investigation's scope.

Conclusions

Although nationally representative data are currently limited in the US, it is possible to obtain community indices of malnutrition, sarcopenia, frailty, and obesity [10, 11]. Obesity and frailty are likely more prevalent among older Americans than malnutrition and sarcopenia, both in the population as well as in OAA nutrition programs; screening and assessment studies are needed to confirm this. OAA programs provide an important preventive health vehicle to help address these challenges at the community level and improve healthy aging and public health. State/territorial units on aging plans should consider giving greater attention to the conditions so local agencies can then do more and older adult nutrition improves. A critical step is for more explicit federal guidance encouraging state/territorial aging plans and Title VI grants to include these nutrition-related conditions as part of their measurable goals/objectives, strategies/actions, and program outcomes. ACL's August 2021 guidance for plans effective on/after October 1, 2022, specifies states/territories will be required to "ensure incorporation of the new purpose of nutrition programming to include addressing malnutrition [21]. This provides the opportunity to impact healthy aging through OAA programs, particularly if it can be coupled with recommendations to operationalize such guidance and address other nutrition-related conditions.

Abbreviations

US
United States
OAA
Older Americans Act
DGA
Dietary Guidelines for Americans
ACL
Administration for Community Living

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are available from the ADvancing States website, which represents the 56 US state/territorial units on aging and disabilities and long-term services/supports directors; http://www.advancingstates.org/initiatives/aging-policy-and-programs/map-state-plans-aging

Competing interests

MBA is an employee and stockholder of Abbott.

JJG has no financial disclosures.

JTD is a member of the scientific advisory boards of McCormick and Company, Bay State Milling, and the Mushroom Council, was a consultant in 2020 for Nestle and in 2019 for Motif FoodWorks, holds stock in several food and drug companies and is editor of *Nutrition Today*; AM is an employee of ADvancing States.

DT is an employee of ADvancing States.

Funding

Not applicable

Authors' contributions

MBA, JJG, JTD: conceptualization/design; MBA, AM: data acquisition; MBA, JJG, JTD, AM, DT: data analysis/interpretation; MBA, JJG, JTD: writing of original manuscript; MBA, JJG, JTD, AM, DT: revision of manuscript. All authors have approved the final article version submitted.

Acknowledgements

Not applicable

Authors' information

Not applicable

References

1. Super N. Three trends shaping the politics of aging in America. Public Policy & Aging Report. 2020;30(2):39–45. https://doi.org/10.1093/ppar/praa006
2. Fong JH. Disability incidence and functional decline among older adults with major chronic diseases. BMC Geriatrics. 2019;19(1):323. https://doi.org/10.1186/s12877-019-1348-z
3. Farber N, Shinkle D, Lynott J, Fox-Grage W, Harrell R. Aging in place: a state survey of livability policies and practices. A research report by the National Conference of State Legislatures and the AARP Public Policy Institute. 2011. https://assets.aarp.org/rgcenter/ppi/liv-com/aging-in-place-2011-full.pdf. Accessed 24 Aug 2021.
4. Tergesen A. How Covid-19 will change aging and retirement. The Wall Street Journal. 2020. https://www.wsj.com/articles/how-covid-19-will-change-aging-and-retirement-11605452401 Accessed 24 Aug 2021.
5. Sousa-Santos AR, Afonso C, Borges N, et al. Sarcopenia, physical frailty, undernutrition and obesity cooccurrence among Portuguese community-dwelling older adults: results from Nutrition UP 65 cross-sectional study. BMJ Open. 2020;10(6):e033661. https://doi.org/10.1136/bmjopen-2019-033661
6. Roberts SB, Silver, R.E., Das, S.K., et al. Healthy aging–nutrition matters: start early and screen often. Adv Nutr. 2021;12(4):1428–1448. ttps://doi.org/10.1093/advances/nmab032
7. Robinson SM. Improving nutrition to support healthy ageing: what are the opportunities for intervention? Proc Nutr Soc. 2018;77(3):257–264. https://doi.org/10.1017/S0029665117004037
8. Shlisky J., Bloom DE, Beaudreault AR, et al. Nutritional considerations for healthy aging and reduction in age-related chronic disease. Adv Nutr. 2017;8(1):17–26. https://doi.org/10.3945/an.116.013474
9. Roberts HC, Lim SER, Cox NJ, Ibrahim K. The challenge of managing undernutrition in older people with frailty. Nutrients. 2019;11(4):808. https://doi.org/10.3390/nu11040808
10. Gahche JJ, Arensberg MB, Weiler M, Dwyer JT. Opportunities for adding undernutrition and frailty screening measures in US national surveys. Adv Nutr. 2021;May 19. https://doi.org/10.1093/advances/nmab056
11. Dwyer JT, Gahche JJ, Weiler M, Arensberg MB. Screening community-living older adults for protein energy malnutrition and frailty: update and next steps. J Comm Health. 2020;45(3):640–660. https://doi.org/10.1007/s10900-019-00739-1
12. US Department of Agriculture, US Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition. 2020. https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf. Accessed 24 Aug 2021.
13. The Malnutrition Quality Collaborative. National Blueprint: Achieving Quality Malnutrition Care for Older Adults, 2020 Update. 2020. https://www.defeatmalnutrition.today/sites/default/files/National_Blueprint_MAY2020_Update_OnlinePDF_FINAL.pdf. Accessed 24 Aug 2021.
14. US Government Accountability Office. (2019). Nutrition assistance programs: Agencies could do more to help address the nutritional needs of older adults, GAO-20-18. 2019. https://www.gao.gov/assets/gao-20-18.pdf. Accessed 24 Aug 2021.

15. Supporting Older Americans Act of 2020. United States: 116th Congress, Public Law 116-131. 2020. https://www.congress.gov/116/plaws/publ131/PLAW-116publ131.pdf. Accessed 24 Aug 2021.
16. Colello KJ, Sussman JS. Older Americans Act: 2020 Reauthorization. Congressional Research Service Report R46439. 2020. https://crsreports.congress.gov/product/pdf/R/R46439. Accessed 24 Aug 2021.
17. Map of state plans on aging. ADvancing States Web site. 2021. http://www.advancingstates.org/initiatives/aging-policy-and-programs/map-state-plans-aging. Accessed 1 Feb 2021.
18. Administration for Community Living. State Unit on Aging Directors Letter #02-2019. 2019. https://acl.gov/sites/default/files/about-acl/2020-08/1_14-01%20SUA%20Directors%20Letter%20%2302-2019%20State%20Plan%20Guidance_508_08172020.pdf. Accessed 1 Feb 2021.
19. Administration for Community Living. Instructions for application for Older Americans Act (OAA), Title VI 2020 grants. 2019. https://acl.gov/sites/default/files/grants/508-Compliant%20FY2020%20TitleVI%20App%20Instructions.pdf. Accessed 1 Feb 2021.
20. Administration for Community Living. Application for Older Americans Act Title VI 2020-2023 grant funds. 2019. https://acl.gov/sites/default/files/grants/508-Compliant%20FY2020%20TitleVI%20App.docx. Accessed 1 Feb 2021.
21. Administration for Community Living. State Unit on Aging Directors Letter #01-2021. 2021. https://acl.gov/sites/default/files/about-acl/2021-08/State%20Plan%20Guidance_Plans%20Due%20Oct%202022%20-%20ACL%20SUA%20Directors%20Letter%20%2301-2021.pdf. Accessed 24 Aug 2021.
22. Crichton M, Craven D, Mackay H, Marx W, de van der Schueren M, Marshall S. A systematic review,meta-analysis and meta-regression of the prevalence of protein-energy malnutrition: associations with geographical region and sex. Age Ageing. 2018;48:38–48. https://doi.org/10.1093/ageing/afy144
23. Cruz-Jentoft AJ, Landi F, Schneider SM, et al. Prevalence of and interventions for sarcopenia in ageing adults: a systematic review. Report of the International Sarcopenia Initiative (EWGSOP and IWGS). Age Ageing. (2014);43(6):748–759. https://doi.org/10.1093/ageing/afu115
24. Collard RM, Boter H, Schoevers RA, Oude Voshaar RC. Prevalence of frailty in community-dwelling older persons: a systematic review. J Am Geriatr Soc. 2012;60(8):1487–1492. https://doi.org/10.1111/j.1532-5415.2012.04054.x
25. Mabli J, Ghosh A, Schmitz B, et al. Evaluation of the effect of the Older Americans Act Title III-C Nutrition Services Program on participants' health care utilization. Cambridge, MA: Mathematica Policy Research. 2018. https://acl.gov/sites/default/files/programs/2018-10/NSPevaluation_healthcareutilization.pdf. Accessed 24 Aug 2021.
26. O'Shaughnessy C V, Mosey A, Roherty M, Terzaghi D. Older Americans Act: the foundation of the Aging Services Network. Arlington, VA: ADvancing States. 2021. http://www.advancingstates.org/sites/nasuad/files/Older%20Americans%20Act%20The%20Foundation%20of%20the%20Aging%20Services%20Network%20Updated.pdf. Accessed 24 Aug 2021.
27. Bergeron CD, John J M, Sribhashyam M, et al. County-level characteristics driving malnutrition death rates among older adults in Texas. J Nutr Health Aging. 2021;1-7. https://doi.org/10.1007/s12603-021-1626-2
28. Tomayko EJ, Mosso KL, Cronin KA, et al. Household food insecurity and dietary patterns in rural and urban American Indian families with young children. BMC Public Health. 2017;17(1):611. https://doi.org/10.1186/s12889-017-4498-y
29. Jernigan VBB, Huyser KR, Valdes J, Simonds VW. Food insecurity among American Indians and Alaska Natives: A national profile using the Current Population Survey-Food Security Supplement. J Hunger Environ Nutr. 2017;12(1):1–10. https://doi.org/10.1080/19320248.2016.1227750
30. Warne D, Wescott S. Social determinants of American Indian nutritional health. Curr Dev Nutr. 2019;3(Suppl 2):12–18. https://doi.org/10.1093/cdn/nzz054
31. Turner Goins R, Schure M, Winchester B. Frailty in older American Indians: The Native Elder Care Study. Gerontol Geriatr Med. 2019;5:2333721419855669. https://doi.org/10.1177/2333721419855669
32. Boll AM, Ensey MR, Bennett KA, et al. A feasibility study of primary care liaisons: linking older adults to community resources. Am J Prev Med. 2021;September 5. https://doi.org/10.1016/j.amepre.2021.05.034

Figures

Figure 1

Percentage of 52 state/territory aging plans with at least one mention of defined nutrition terms*

* US state/territory unit on aging plans reviewed were those available on the ADvancing States website in February 2021; results reflect percentage of at least one mention in overall plan and in plan goal/objective, and strategy/action

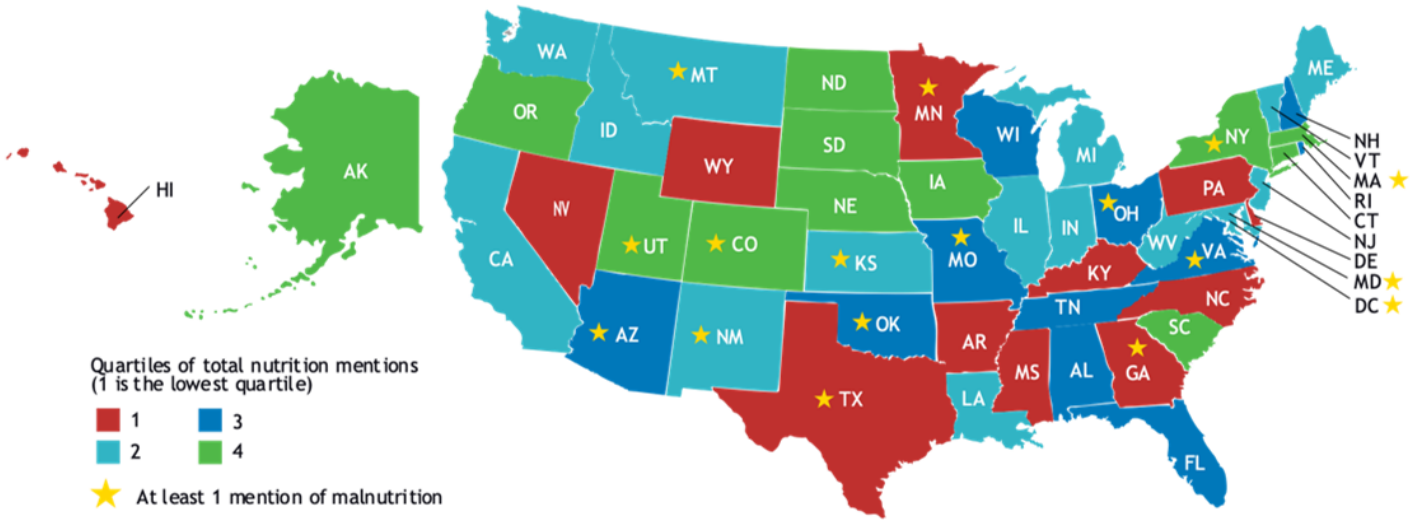

Figure 2

states by quartile of nutrition mentions and higher number malnutrition mentions in aging plans*

*State unit on aging plans reviewed were those available on the ADvancing States website in February 2021.