



The Role of Inpatient Malnutrition Care to Address Health Disparities among Older Adults

Naila Wahid, MHA; Christina Badaracco, MPH, RDN, LDN; Angel F. Valladares, MPH; Ashley Depriest, MS, RDN; Alyssa Collins, MS, RD, LDN; Kristi Mitchell, MPH

MALNUTRITION REFERS TO deficiencies, excesses, and imbalances in the intake of nutrients over prolonged periods of time, resulting in loss of fat stores, muscle wasting, or the overall inability to maintain essential body functions.¹ Malnutrition is a complex and burdensome condition, often associated with higher rates of postoperative complications, mortality, and lengths of stay.² Fewer than half of older adults meet the Dietary Guidelines for Americans.³

The burden of malnutrition, although prevalent across all backgrounds and settings, disproportionately affects subpopulations, including underserved groups and older adults.^{4,5} Malnutrition occurs more frequently among non-Hispanic Black, Hispanic, low-income, and rural households.⁶ Systematic reviews have found an association between malnutrition and unfavorable clinical outcomes (eg, hospital mortality and length of stay).^{4,7} Malnutrition interventions initiated in inpatient settings are associated with decreased mortality risk, length of stay, and readmission rates, and increased quality of life.⁸ Among older adults, malnutrition risk factors include the presence of comorbid conditions, lower income, functional limitations and/or disabilities, and dining alone.⁹

Food insecurity (or the inability to acquire enough food to meet the needs of all household members) is a related yet distinct issue that disproportionately affects vulnerable populations.¹⁰

The rate of food insecurity in Black, Hispanic or Latino, and Native American households is approximately twice the rate in White households. Female-headed households also report higher food insecurity compared with the national average.¹¹ Because dietary patterns in households with food insecurity can lead to nutritional deficiencies (ie, inadequate vitamins, minerals, and macronutrients), it is a particularly high-risk factor for malnutrition. Therefore, ensuring equitable access to nutritious food and malnutrition care—particularly in underserved communities—can be critical for addressing health disparities.

Timely identification of malnutrition risk, which can be supported by use of the quality measures developed through the Malnutrition Quality Improvement Initiative (MQii), can help to improve identification and diagnosis of malnutrition and the related issue of food insecurity that influence overall well-being, enabling more timely and comprehensive interventions to address these disparities.^{4,12} This article presents MQii-based examples of the relationship between malnutrition and health disparities and offers implications for clinical nutrition practice.

MALNUTRITION'S INFLUENCE ON CLINICAL OUTCOMES FOR OLDER ADULTS

Malnutrition can have many deleterious effects on health status, including diminished mental capacity and adverse physiological function.¹³ Although malnutrition affects more than 30% of hospitalized patients, only 9% of discharged patients had documentation of a malnutrition diagnosis code in 2018.^{14,15} According to Guenter and colleagues,¹⁴ unaddressed malnutrition (whether unidentified or untreated) can worsen

health outcomes and increase risk of readmissions and costs of care. For example, clinical outcomes (eg, length of stay, hospitalization costs, readmission rates, complications, and in-hospital mortality) tend to be higher for patients with a malnutrition diagnosis compared with those without a malnutrition diagnosis.⁸

Given that hospitalized older adults experience malnutrition at higher rates and the evidence of poorer outcomes for malnourished patients, it is critical to identify patients who are malnourished or at-risk of malnutrition in hospital settings to minimize adverse outcomes.

Opportunities to Address Disparities in Malnutrition Care

The MQii is a project of the Academy of Nutrition and Dietetics, Avalere Health, and other stakeholders who provided input through a collaborative partnership to advance malnutrition care across the nation. The MQii supports a national Learning Collaborative of more than 300 US health care institutions committed to advancing malnutrition standards of care. To accomplish this goal, hospitals have implemented a combination of electronic clinical quality measures to track and monitor care for older adults in inpatient settings, and complementary process improvement initiatives.

Quality measures serve as tools to help quantify health care processes, outcomes, patient perceptions, and organizational structures associated with the ability to provide high-quality health care.¹⁶ Through their use, providers can be empowered to quantify gaps in all areas of health care and to address health disparities in malnutrition care specifically.

The Global Malnutrition Composite Score¹⁷ is an electronic clinical quality

This article is published as part of a supplement supported by the Academy of Nutrition and Dietetics with funding from Abbott Nutrition, a Division of Abbott.

<https://doi.org/10.1016/j.jand.2022.06.015>

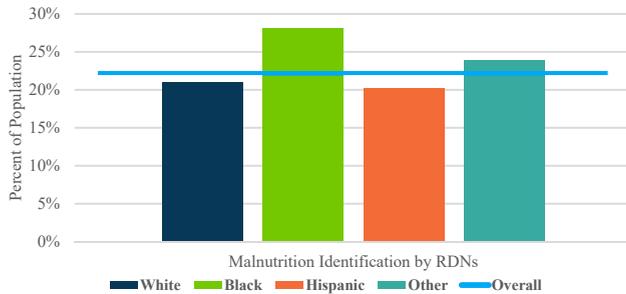


Figure 1. Malnutrition identification rate by registered dietitian nutritionists (RDNs) in acute care hospitals, stratified by patient race/ethnicity, in 2019.

measure endorsed by the National Quality Forum and adopted by the Centers for Medicare and Medicaid Services¹⁸ to identify and manage malnutrition in hospitalized adults. It is composed of four component measures related to malnutrition screening, malnutrition assessment by a registered dietitian nutritionist (RDN), malnutrition diagnosis documentation, and malnutrition care plan development to support optimal malnutrition care for adults aged 65 years and older admitted to inpatient service. Collectively, these four measures (which can also be tracked as independent measures) are intended to better identify patients who are malnourished or at-risk of malnutrition, and who may also benefit from being screened for the related issue of food insecurity.

An analysis of 2019 MQii Learning Collaborative data revealed disparities in the burden of malnutrition across different racial and ethnic groups as identified by RDNs (Figure 1). These findings align with prevalence rates in other literature that indicate higher rates of malnutrition among the Black population (Figure 1).¹⁹

In addition, the readmission rate for non-Hispanic Black individuals with

malnutrition was more than 26%, compared with <19% among non-Hispanic White individuals (Figure 2). In another study, Basu and colleagues²⁰ found that disparities in readmissions rates by race/ethnicity were affected by patients' type of insurance coverage. Notably, uninsured minority populations had a slightly lower risk of readmissions compared to privately insured or Medicare patients of any race.

In addition to racial and ethnic disparities, MQii data also revealed lower measure component performance scores in rural hospitals compared to urban hospitals (Figure 3). On average, rural hospitals performed lower than urban hospitals on three out of four component measures (particularly for conducting nutrition assessments and documenting a care plan for those identified as malnourished) (unpublished data).

The performance differences may be attributed to lower access to providers in rural settings (ie, fewer RDNs to provide care). Without access to RDNs, and with a growing rate of rural hospital closures, rural residents may be less aware of the importance of nutrition to promote optimal health.²¹ Less exposure to RDNs may also limit

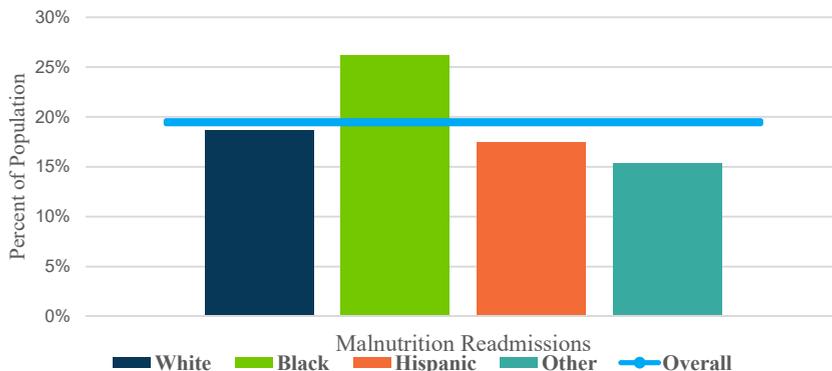


Figure 2. 2019 Hospital readmissions for patients with malnutrition, stratified by race/ethnicity.

identification of beneficial services that could meet people's needs related to malnutrition and food insecurity. Moreover, older adults may have fewer opportunities for social interaction in rural areas, which often influence emotional well-being and physical health.²² Loss of appetite and impaired self-care, which are common symptoms of depression, have been found to affect nutritional status.²³

THE ROLE OF QUALITY MEASUREMENT IN ALLEVIATING MALNUTRITION AND ADDRESSING HEALTH DISPARITIES

As shown by the MQii Learning Collaborative, implementing a standardized approach to optimize malnutrition care in hospital settings provides an important opportunity to address health disparities in malnutrition care. Hospitals have many opportunities to address malnutrition through patient and provider education, quality improvement initiatives, and quality measurement. Advantages of utilizing malnutrition-focused quality measures in the inpatient setting have included increased rates of:²⁴

- identification of patients with malnutrition risk who may require additional screening for food insecurity;
- provision of early and effective interventions for patients with malnutrition and food insecurity;
- documentation of provider concerns regarding malnutrition and food insecurity for transmission to the next-in-line provider(s); and
- referral for additional evaluation by an RDN and connection to resources—such as prescriptions for food pharmacies (or referral-based programs to increase access to healthy foods), home-delivered meals, and connection to community-based organizations that address food and nutrition needs—after discharge.

Regular measurement of variables reflecting the quality of malnutrition care can also help to minimize unnecessary care and improve treatment for patients who may otherwise experience worse outcomes in the case that their malnutrition was not identified.

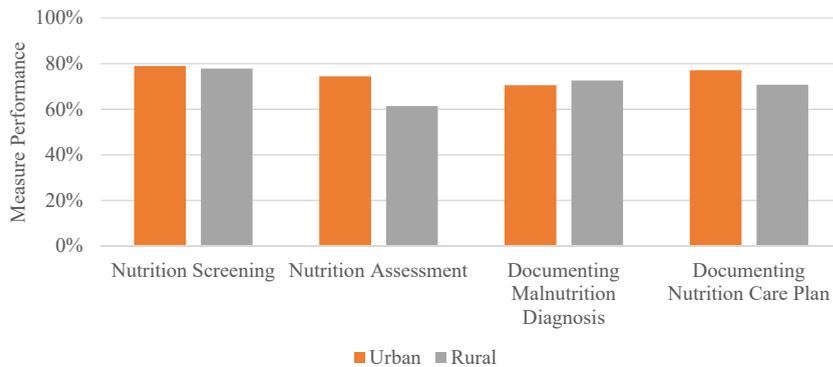


Figure 3. 2019 Malnutrition Quality Improvement Initiative quality measure component performance, comparing rural vs urban acute care hospitals.

MQii Learning Collaborative Hospitals Exemplify Success in Improving Malnutrition Care and Addressing Health Disparities

Demonstrating the MQii Learning Collaborative’s commitment to improving malnutrition care delivery, two Learning Collaborative hospitals have undertaken innovative initiatives to improve health and advance equity through their malnutrition care processes. Health equity refers to the underlying commitment to strive for justice and fairness in accessing optimal health, with special attention for the most vulnerable populations based on social determinants of health (such as education and socioeconomic status).²⁵

The first example is WellStar Health System, the largest health care system with 34 locations in Georgia with a mission to “enhance the health and well-being of every person we serve” and ultimately work to close the gap of health inequities, such as access to health care and nutritious food. WellStar Kennestone utilizes video chat technology for translation services and

ensures that patients who are hard of hearing have access to visual services while keeping patients safe and distanced during the coronavirus disease 2019 (COVID-19) pandemic. As part of its commitment to equitable treatment, WellStar offers kosher, halal, vegan, and vegetarian options to respect religious practices and personal preferences. Implementing and tracking malnutrition-focused quality measures in the hospital can lead to reduced disparities in accessing nutritious foods and health care services following discharge (see Figure 4).

University of North Carolina at Chapel Hill (UNC Health) is the second example of advancing health equity through malnutrition care (see Figure 5). UNC Health has created initiatives to execute its broader mission of addressing food insecurity to make nutrition and health services more accessible to all people in their community. During inpatient admissions at UNC Medical Center, clinical teams screen all patients for food insecurity using the Hunger Vital Sign screening tool.²⁶ RDNs and nutrition and dietetic technicians, registered, connect with

local programs to verify up-to-date operational and contact information about local social services and food resource programs. The handouts include food pantries, meal service programs, and community kitchens where hot meals are served. The resources explain how to apply for federal nutrition programs and RDNs offer them to all patients with food insecurity.

The success of these hospitals’ comprehensive, patient-centered programs demonstrates the benefits of identifying risk early and providing coordinated care. They further address upstream social risk factors (ie, macro-level factors that influence health and health systems, policies, and social, physical, economics, and environmental factors) to improve health outcomes.²⁷

Expanded Malnutrition Care in Acute Care Settings Helps Address Food Insecurity

A standardized care process for malnutrition in acute care settings addresses the significant clinical burden of malnutrition and can set the foundation to explore food insecurity in greater detail. Proper nutrition requires consistent access to healthy food, knowledge of and transportation to grocers and vendors, and financial resources to purchase food. This can be even more challenging for older adults, who often face mobility or cognitive challenges in the planning, acquisition, and preparation of healthy foods.⁹ The absence of any combination of these can contribute to food insecurity.

According to the US Department of Agriculture’s Economic Research Service, 10.5% of households were food insecure or had very low food security throughout 2020.¹⁰ Food insecurity can also contribute to obesity, diabetes, depression, and other chronic conditions, while also worsening outcomes for patients with comorbid conditions.^{28–30}

Screening and referrals to support services addressing food insecurity can be integrated into the recommended malnutrition clinical workflow shown in Figure 6, which can be supported by use of malnutrition quality measures.

Failure to recognize malnutrition and food insecurity by providers can worsen the health and social risk factors of underserved populations and

From the Field

“**WELLSTAR HEALTH SYSTEM** strives to complete malnutrition screening within 12 hours of admission and a dietitian assessment within 24 hours of identifying risk. Receiving our MQii data helps us not only track how we are doing as an individual hospital, but also provides context with comparisons to other, similar hospitals. Standardizing malnutrition screening ensures we are applying the malnutrition care process equitably across all patients.”

Figure 4. From the field.

From the Field

“**UNC MEDICAL CENTER** provides food insecure patients with supplemental food bags via an on-site food pantry program that supports all inpatient services and outpatient oncology and pediatric clinics. We connect teammates with NCCARE360, a statewide referral network that integrates healthcare and human service organizations aimed to facilitate connecting patients to community resources. We also developed a training titled Registered Dietitians Advocating Inclusion, Diversity and Equity (RD AIDE) to promote dialogues about identity and the complex ways that race affects people in healthcare settings.”

Figure 5. From the field.

perpetuates health inequities that affect racial and ethnic subpopulations, rural populations, and older adults.¹⁷ Integrating quality measurement and evidence-based malnutrition care in interdisciplinary clinical settings may promote the identification of malnutrition and food insecurity risk by food and nutrition practitioners and lead to effective treatment, ultimately improving health outcomes.³¹

Identifying food insecurity during a hospital visit grants providers an

opportunity to connect patients to follow-up care in community settings (see [Figure 2](#)). Outpatient settings also benefit from nutrition-focused quality improvement programs, which have shown reductions in resource use and in cost.³² There is also an opportunity to encourage full utilization of community and federal nutrition support services. For example, fewer than 50% of eligible older adults are enrolled in the Supplemental Nutrition Assistance Program—the nation’s largest federal nutrition

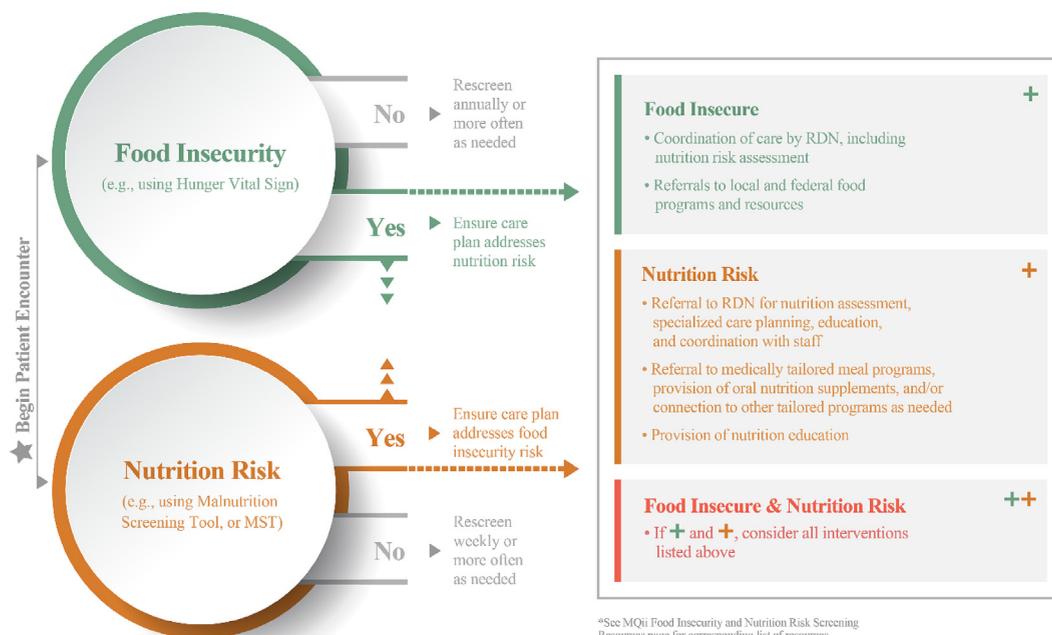
assistance program—attributed to social isolation and lack of awareness.³³

Influence of COVID-19

The imperative to address food insecurity is even stronger since the prevalence of food insecurity and its effects on malnutrition have been heightened during the COVID-19 pandemic. The pandemic has increased the burden of employment disruptions, poverty, loss of public transportation, delays in food and meal delivery, and social isolation, while disrupting access to nutritious food.^{9,34,35} For individuals infected with COVID-19, the physiological effects may further exacerbate malnutrition symptoms through inflammation and digestive complications that influence nutrient absorption. Those at higher risk for malnutrition are also more likely to be hospitalized with complications due to impaired immune function, higher risk of infection, and greater disease severity.³⁶ These findings add to the evidence regarding the malnutrition-related disparities seen across different patient populations and elevate the importance of addressing them.

Perform Screenings for Food Insecurity & Nutrition Risk

Connect to Patient Resources, Clinical & Community Services*



*See MQi Food Insecurity and Nutrition Risk Screening Resources page for corresponding list of resources.

Figure 6. Food insecurity and malnutrition risk screening workflow.

CONCLUSIONS

As the Centers for Medicare and Medicaid Services, private payers, and other key health care stakeholders consider opportunities to address health inequities, expanding malnutrition measurement may help reveal gaps in nutrition care and provide opportunities for providers to refer their malnourished and/or food insecure patients to appropriate resources. The Global Malnutrition Composite Score can serve as an anchor for addressing disparities in acute inpatient settings by laying a foundation for multidisciplinary care teams to collect actionable data, measure progress, and direct community resources to those found to be malnourished, food insecure, or at risk for these conditions. Screening for and identifying malnutrition in the hospital can help flag individuals who may also be food insecure. Conversely, identifying food insecurity may indicate potential malnutrition due to lower consumption of foods with essential nutrients.³⁷

RDNs participating in the MQii Learning Collaborative report that they connect patients in need to community services (eg, Supplemental Nutrition Assistance Program-Education and referral-based medically tailored meal delivery). In addition, RDNs who work in these community settings also play important and direct roles in delivering needed services that help to address and/or prevent the disparities described above. RDNs throughout the United States continue to take leadership roles in identifying and managing malnutrition. Further opportunities to collaborate with community-based organizations to implement pilot studies and generate evidence about effective nutrition interventions across care transitions may also be explored to help identify and expand actionable solutions to ensure more equitable outcomes.

References

1. Malnutrition Quality Improvement Initiative. Updated MQii toolkit: glossary of terms. Accessed June 16, 2022. <https://malnutritionquality.org/wp-content/uploads/glossary-of-terms.pdf>
2. Saunders J, Smith T. Malnutrition: causes and consequences. *Clin Med (Lond)*. 2010;10(6):624-627.
3. Choi YJ, Crimmins EM, Kim JK, Ailshire JA. Food and nutrient intake and diet quality

- among older Americans. *Public Health Nutr*. 2021;24(7):1638-1647.
4. Reber E, Gomes F, Vasiloglou MF, et al. Nutritional risk screening and assessment. *J Clin Med*. 2019;8(7):1065.
5. Fávoro-Moreira NC, Krausch-Hofmann S, Matthys C, et al. Risk factors for malnutrition in older adults: a systematic review of the literature based on longitudinal data. *Adv Nutr*. 2016;7(3):507-522.
6. Morales DX, Morales SA, Beltran TF. Racial/ethnic disparities in household food insecurity during the COVID-19 pandemic: a nationally representative study. *J Racial Ethn Health Disparities*. 2021;8(5):1300-1314.
7. Magesh S, John D, Li WT, et al. Disparities in COVID-19 outcomes by race, ethnicity, and socioeconomic status: a systematic review and meta-analysis. *JAMA Netw Open*. 2021;4(11). 2021;e2134147.
8. Uhl S, Siddique SM, McKeever L, et al. *Malnutrition in Hospitalized Adults: A Systematic Review*. Agency for Healthcare Research and Quality; 2021. Report No 21(22); EHC035.
9. Netterville L. National Resource Center on Nutrition and Aging. Addressing food insecurity and malnutrition in older adults in the age of COVID-19. Updated April 2021. Accessed June 16, 2022. https://acl.gov/sites/default/files/programs/Senior_Nutrition/AddressingFoodInsecurityMalnutritionCOVID19.docx
10. US Dept of Agriculture, Economic Research Service. Food insecurity in the US. Updated September 8, 2021. Accessed June 16, 2022. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/key-statistics-graphics/>
11. Hunger Task Force. *Nutrition equity*. Accessed June 16, 2022. <https://www.hungertaskforce.org/about-hunger/priority-campaigns/nutrition-equity/>
12. Dawson MA, Blancato B. To advance health equity, measure hospital malnutrition care. *Health Affairs Blog*. Accessed June 16, 2022. <https://www.healthaffairs.org/doi/10.1377/forefront.20210930.667648/full/>
13. Siddiqui F, Salam RA, Lassi ZS, et al. The intertwined relationship between malnutrition and poverty. *Front Public Health*. 2020;8:453.
14. Agency for Healthcare Research and Quality, Effective Healthcare Program. Research protocol: malnutrition in hospitalized adults. *Reviewed December*. Accessed June 16, 2022. <https://effectivehealthcare.ahrq.gov/products/malnutrition-hospitalized-adults/protocol>
15. Guenter P, Abdelhadi R, Anthony P, et al. Malnutrition diagnoses and associated outcomes in hospitalized patients: United States, 2018. *Nutr Clin Pract*. 2021;36(5):957-969.
16. Center for Medicare and Medicaid Services. *What is a quality measure*. Accessed June 16, 2022. <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/NTM-What-is-a-Quality-Measure-SubPage>
17. The Academy of Nutrition and Dietetics. Clinical malnutrition. Accessed June 16, 2022. <https://www.eatrightpro.org/practice/practice-resources/clinical-malnutrition>
18. 42 CFR Parts 412, 413, 482, 485, and 495. Medicare Program; Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals and the Long-Term Care Hospital Prospective Payment System and Policy Changes and Fiscal Year 2023 Rates; Quality Programs and Medicare Promoting Interoperability Program Requirements for Eligible Hospitals and Critical Access Hospitals; Costs Incurred for Qualified and Non-qualified Deferred Compensation Plans; and Changes to Hospital and Critical Access Hospital Conditions of Participation. Final rule (FR DOC #2022-16472) US Department of Health and Human Services, Centers for Medicare and Medicaid Services. Accessed August 2, 2022. <https://public-inspection.federalregister.gov/2022-16472.pdf>
19. Sheean P, Farrar IC, Sulo S, Partridge J, Schiffer L, Fitzgibbon M. Nutrition risk among an ethnically diverse sample of community-dwelling older adults. *Public Health Nutr*. 2019;22(5):894-902.
20. Basu J, Hanchate A, Bierman A. Racial/ethnic disparities in readmissions in US hospitals: the role of insurance coverage. *Inquiry*. 2018;55. 2018;46958018774180.
21. Government Accountability Office. Rural hospital closures: affected residents had reduced access to health care services. December 22, 2020. Accessed June 16, 2022. <https://www.gao.gov/products/gao-21-93>
22. National Academies of Science. *Social Isolation and Loneliness in Older Adults: Opportunities for the Health Care System*. The National Academies Press; 2020.
23. Jung SE, Bishop AJ, Kim M, Hermann J, Kim G, Lawrence J. Nutritional status of rural older adults is linked to physical and emotional health. *J Acad Nutr Diet*. 2017;117(6):851-858.
24. National Quality Forum. *Prevention and Population Health Final Report: fall 2020 cycle*. Accessed June 16, 2022. https://www.qualityforum.org/Publications/2021/10/Prevention_and_Population_Health_Final_Report_-_Fall_2020_Cycle.aspx
25. Braveman P. What are health disparities and health equity? We need to be clear. *Public Health Rep*. 2014;129(Suppl 2):5-8.
26. Gattu RK, Paik G, Wang Y, Ray P, Lichenstein R, Black MM. The Hunger Vital Sign identifies household food insecurity among children in emergency departments and primary care. *Children (Basel)*. 2019;6(10):107.
27. Bharmal N, Derosé KP, Felician M, Weden MM. Understanding the upstream social determinants of health. May 2015. Accessed June 16, 2022. https://www.rand.org/content/dam/rand/pubs/working_papers/WR1000/WR1096/RAND_WR1096.pdf
28. Huizar MI, Arena R, Laddu DR. The global food syndemic: the impact of food insecurity, malnutrition and obesity on the healthspan amid the COVID-19 pandemic. *Prog Cardiovasc Dis*. 2021;64:105-107.
29. Pourmotabbed A, Moradi S, Babaei A, et al. Food insecurity and mental health: a

- systematic review and meta-analysis [published correction appears in *Public Health Nutr.* 2020 Jul;23(10):1854]. *Public Health Nutr.* 2020;23(10):1778-1790.
30. Holben DH, Marshall MB. Position of the Academy of Nutrition and Dietetics: Food insecurity in the United States. *J Acad Nutr Diet.* 2017;117(12):1991-2002.
 31. Academy of Nutrition and Dietetics. Quality Strategy and Health Equity Guide. Accessed June 16, 2022. <https://www.eatrightpro.org/practice/quality-management/quality-strategies>
 32. Hong K, Sulo S, Wang W, et al. Nutrition care for poorly nourished outpatients reduces resource use and lowers costs. *J Prim Care Community Health.* 2021;12.
 33. US Dept of Agriculture. SNAP participation rates by state, elderly people. Accessed June 16, 2022. <https://www.fns.usda.gov/usamap/2019>
 34. Handu D, Moloney L, Rozga M, Cheng FW. Malnutrition care during the COVID-10 pandemic: considerations for registered dietitian nutritionists. *J Acad Nutr Diet.* 2021;121(5):979-987.
 35. National Academy of Social Insurance. Published. The Impact of the COVID-19 pandemic on access to health care. Accessed June 16, 2022. <https://www.nasi.org/research/medicare-health-policy/the-impact-of-the-covid-19-pandemic-on-access-to-health-care/>
 36. Antwi J, Appiah B, Oluwakuse B, et al. The nutrition-COVID-19 interplay: a review. *Curr Nutr Rep.* 2021;10(4):364-374.
 37. Avery A. Food insecurity and malnutrition. *Komp Nutr Diet.* 2021;1:41-43.

AUTHOR INFORMATION

This article was written by Naila Wahid, MHA, consultant II, and Christina Badaracco, MPH, RD, LDN, research scientist II, Avalere Health, Washington, DC; Angel F. Valladares, MPH, associate principal, IQVIA, Durham, NC; Ashley Depriest, MS, RDN, a certified nutrition support clinician and clinical nutrition manager, WellStar Kennestone Regional Medical Center, Marietta, GA; Alyssa Collins, MS, RD, LDN, a certified nutrition support clinician and clinical dietitian II, UNC Health, Chapel Hill, NC; and Kristi Mitchell, MPH, senior advisor, Avalere Health, Vienna, VA; at the time of the study she was practice director, Avalere Health, Washington, DC.

Address correspondence to: Naila Wahid, MHA, Avalere Health, 1201 New York Ave, Washington, DC 20005. E-mail: nwahid@avalere.com

STATEMENT OF POTENTIAL CONFLICT OF INTEREST

The Malnutrition Quality Improvement Initiative is a project of the Academy of Nutrition and Dietetics, Avalere Health, and other stakeholders who participated in and provided guidance and expertise in this collaborative partnership. N. Wahid is an employee of Avalere Health. A. Valladares is an employee of IQVIA. A. Depriest is an employee of WellStar Kennestone Regional Medical Center. A. Collins is an employee of UNC Health. K. Mitchell is a senior advisor at Avalere Health.

FUNDING/SUPPORT

The Academy of Nutrition and Dietetics provides resources and services to support the Malnutrition Quality Improvement Initiative (MQii) and does not receive funding for the MQii. Avalere Health's work to support the MQii was funded by Abbott.

ACKNOWLEDGEMENTS

The authors thank Michelle Bruno, MPP (Avalere Health), Jessica McGee, MS, RD, CSP-CC, LD, CNSC (UNC Health); Francine Walker, RD, LDN, CNSC (UNC Health); Lana Nasrallah, MPH, RD, LDN (UNC Health); and Beth Macintosh, MPH, RD, LDN (UNC Health).

AUTHOR CONTRIBUTIONS

N. Wahid drafted the manuscript. All coauthors reviewed, contributed to, and commented on subsequent drafts of the manuscript.