ACL Administration for Community Living

IssueBRIEF

AoA Administration on Aging

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Older Americans Act Title III-C Nutrition Services Program: **Examining the Diagnoses Underlying Adverse Health Events**

BACKGROUND

Individuals typically face declining physical and cognitive function as they age. Older adults (ages 65 or older) experience hospitalizations at rates two to four times greater than prime-age adults (ages 18 to 64), and both hospitalization and readmission rates increase with age among Medicare beneficiaries age 65 and older (Gorina et al. 2015; McDermott et al. 2017). Many older adults live with chronic health conditions, including diabetes and heart disease, which can lead to complications and limitations in activities of daily living (AARP Chronic Care 2009). Additionally, more than 30 percent of individuals age 65 and older fall each year, and in half of the individuals, falls are recurrent (Dionyssiotis 2012).

The underlying diagnoses associated with adverse health events among older adults vary widely, and include both chronic and acute conditions. Congestive heart failure, osteoarthritis, cardiac dysrhythmias, chronic obstructive pulmonary disease (COPD), pneumonia, and acute cerebrovascular disease are common diagnoses associated with hospitalizations (McDermott et al. 2017). Home-health patients were most frequently diagnosed with diabetes, congestive heart failure, COPD, hypertension, and cerebrovascular disease (Caffrey et al. 2011). About three-quarters of emergency department visits by older adults result from illness, with the remainder resulting from injury (Albert et al. 2017).

The Older Americans Act Title III-C Nutrition Services Program (NSP) strives to promote the health and well-being of, and reduce hunger and food insecurity among, older adults by providing congregate and home-delivered meals. Overseen by the Administration on Aging (AoA) within the Administration for Community Living of the U.S. Department of Health and Human Services, the NSP is the largest program in the United States that provides prepared meals to older adults in need. It also provides a range of services, including nutrition education and counseling, opportunities for social engagement, and health promotion and disease prevention activities.

The most recent evaluation of the effectiveness of the NSP on health outcomes found that the most prevalent adverse health events among congregate and home-delivered meal participants were hospital admissions, emergency department visits, and home health episodes (Mabli et al. 2018). The evaluation also found that the likelihood of experiencing an adverse health event was lower for nursing home admissions and similar for other events including home health episodes and emergency department visits for congregate meal participants compared to nonparticipants. The opposite was true for home-delivered meal participants, who were more likely than nonparticipants to experience hospital admissions, emergency department visits, and nursing home admissions.

This issue brief examines the most common diagnoses underlying adverse health events experienced by NSP participants. Although research on the NSP has focused on the program's effects on health and well-being, little is known about the diagnoses underlying adverse health events among participating older adults (Frongillo and Wolfe 2010; Mabli et al. 2017, 2018; Racine et al. 2012;

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Thomas et al. 2015, 2018; Wright et al. 2015). Understanding these diagnoses is particularly important for contextualizing the program effects presented in the most recent NSP evaluation (Mabli et al. 2018). For example, although NSP participants and nonparticipants differed in the likelihood of experiencing several types of adverse health events, it is unknown whether the severity of these events and the types of diagnoses differed among these two groups. Identifying these diagnoses can help program administrators tailor the health-promotion and disease-prevention services offered by many service providers in the Aging Network and can help providers more strongly integrate their programming with other community health partners.

METHODS

The data used in the analysis were collected as part of the Title III-C NSP Evaluation (Mabli et al. 2017, 2018). To estimate the effect of receiving a congregate or home-delivered meal on a range of outcomes, the study team compared outcomes for participants and a matched comparison group of program-eligible nonparticipants using data collected in surveys conducted in 2015 to 2017, as well as Medicare claims and enrollment data obtained through the Centers for Medicare & Medicaid Services (CMS) Research Data Assistance Center. The original evaluation sample consisted of 2,255 individuals. Restricting the sample to participants and nonparticipants with valid Medicare claims information resulted in the inclusion of 1,341 individuals in the analysis.

This brief examines the diagnoses experienced by 676 participants and nonparticipants who had a hospitalization, emergency department visit, or home health episode over a 12-month period. These three types of events were the adverse health events participants were most likely to experience in the evaluation report (Mabli et al. 2018). Because individuals could experience multiple adverse health events during this period, each event is included as a separate observation. The diagnoses are based on ICD-10 Clinical Classification Software (CCS) primary diagnosis codes. The analysis only includes primary diagnoses associated with these events and experienced by at least 1 percent of program participants in the 9 months before the 12-month period. The primary or principal diagnosis on a Medicare claim identifies the condition that was mainly responsible for the patient's visit to the hospital or health care provider, with additional diagnoses identified during treatment also listed on the claim.

Findings are analyzed separately for congregate and home-delivered meal participants and nonparticipants as well as for individuals living in lower-income or higher-income households. Individuals were defined as living in lower-income households if their monthly income (calculated from the NSP outcomes survey as a percentage relative to the federal poverty threshold) was less than the median value in the sample (129 percent for congregate meal participants and 122 percent for home-delivered meal participants). Individuals living in higher-income households had monthly incomes greater than or equal to the median value.

FINDINGS

Most common diagnoses underlying events among congregate meal participants

The 10 most common primary diagnoses underlying adverse health events experienced by congregate meal participants account for more than two-thirds of these events (Table 1). The most frequent diagnosis was rheumatoid arthritis, osteoarthritis, or another connective tissue disorder (hereafter called *arthritis*) (12 percent). Other common diagnoses were diseases of the respiratory system, including COPD (10 percent), pneumonia (5 percent), or respiratory failure (4 percent); and diagnoses related to heart disease including nonspecific chest pain (9 percent) and cardiac dysrhythmias (6 percent). Urinary tract infection (UTI) (9 percent), superficial injuries (5 percent), fractures (4 percent), and diabetes (4 percent) were also common.

Most common diagnoses underlying events among home-delivered meal participants

Home-delivered meal participants experienced a wide array of diagnoses associated with their adverse health events. For this group, the top 10 diagnoses cover about 60 percent of all events (Table 2). The most common diagnosis was arthritis (9 percent), followed by genitourinary symptoms (8 percent) and mood disorders (7 percent).[1] Fractures and superficial injuries each represented 6 percent of adverse health events, as did diabetes. Skin infections, hypertension, and COPD (each 5 percent) and congestive heart failure (4 percent) were the next most common diagnoses.

[1] Genitourinary symptoms consist of diseases, anomalies, trauma, or conditions of the genital organs or urinary structure.

TABLE 1: Common primary diagnoses among congregate meal participants who experience adverse health events

Diagnosis	Percentage
Rheumatoid arthritis, osteoarthritis, and other connective tissue diseases	11.67%
COPD	9.93%
Nonspecific chest pain	9.43%
UTI	9.06%
Cardiac dysrhythmias	5.53%
Superficial injury; contusion	4.73%
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	4.64%
Fractures	4.49%
Respiratory failure	4.47%
Diabetes	4.44%

Source: Medicare claims and enrollment data matched to AoA NSP outcomes survey, 2015–2016, weighted data.
Note: The most common diagnoses reported for individuals who experienced a hospitalization, emergency department visit, or home health episode in the 12-month observation period. Tabulations are based on an unweighted sample size of 294 events experienced by 117 congregate meal participants.

Differences in diagnoses between congregate meal participants and nonparticipants experiencing adverse health events

Although the share of congregate meal participants experiencing most types of adverse health events was either similar to or smaller than the share of nonparticipants experiencing these events (Mabli et al. 2018), the diagnoses associated with these events differ between these two groups. Compared to nonparticipants, congregate meal participants were more likely to have a diagnosis of nonspecific chest pain (7 percentage points), UTI (5 percentage points), or COPD or pneumonia (4 percentage points each) (Table 3). Conversely, participants were less likely than nonparticipants to have a primary diagnosis of fracture, open wounds, or arthritis (5 percentage points each).[2]

Some of these differences mainly reflect the experiences of lower-income individuals. Among lower-income households, participants were much less likely than nonparticipants to have a primary diagnosis of arthritis and were much more likely to be diagnosed with UTI or COPD. Among higher-income households, participants were less likely than nonparticipants to have hypertension but more likely to have conditions associated with dizziness or vertigo or a superficial injury.

Differences in diagnoses between home-delivered meal participants and nonparticipants experiencing adverse health events

There are large differences in the types of diagnoses for adverse health events experienced by home-delivered meal participants compared to nonparticipants. Participants were more likely than nonparticipants to have primary diagnoses of genitourinary symptoms (8 percentage points), mood disorders (6 percentage points), skin infections (5 percentage points), or chronic skin ulcers or pneumonia (3 percentage points each); these diagnoses were all very uncommon among nonparticipants (Table 4). Participants were less likely to be diagnosed with hypertension (9 percentage points), diabetes (6 percentage points), nonspecific chest pain (5 percentage points), or cardiac dysrhythmias or COPD (3 percentage points each).[3]

[2] Results for the full list of diagnoses prevalent among congregate meal participants are included in supplemental table 1.

[3] Results for the full list of diagnoses prevalent among home-delivered meal participants are included in supplemental table 2.

TABLE 2: Common primary diagnoses among home-delivered meal participants who experience adverse health events

Diagnosis	Percentage
Rheumatoid arthritis, osteoarthritis, and other connective tissue diseases	8.61%
Genitourinary symptoms and ill-defined conditions	8.17%
Mood disorders	7.17%
Fractures	6.45%
Diabetes	6.05%
Superficial injury; contusion	5.55%
Skin and subcutaneous tissue infections	5.31%
Hypertension	5.02%
COPD	4.90%
Congestive heart failure	4.30%

Source: Medicare claims and enrollment data matched to AoA NSP outcomes survey, 2015–2016, weighted data.
Note: The most common diagnoses reported for individuals who experienced a hospitalization, emergency department visit, or home health episode in the 12-month observation period. Tabulations are based on an unweighted sample size of 506 events experienced by 167 home-delivered meal participants.

TABLE 3: Differences in the prevalence of diagnoses underlying adverse events experienced by congregate meal participants and nonparticipants

Diagnosis	Percentage		
	Participants	Nonparticipants	Difference
Largest positive differences			
Nonspecific chest pain	9.4%	2.0%	7.4
UTI	9.1%	3.6%	5.4
COPD	9.9%	5.7%	4.2
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	4.6%	0.9%	3.7
Diabetes	4.4%	1.6%	2.8
Largest negative differences			
Other diseases of veins and lymphatics	0.4%	2.8%	-2.4
Hypertension	3.4%	5.8%	-2.4
Rheumatoid arthritis, osteoarthritis, and other connective tissue diseases	11.7%	16.6%	-5.0
Open wounds of extremities	1.6%	6.9%	-5.4
Fracture	4.5%	9.9%	-5.4

Source: Medicare claims and enrollment data matched to AoA NSP outcomes survey, 2015–2016, weighted data.
Note: The most common diagnoses reported for individuals who experienced a hospitalization, emergency department visit, or home health episode in the 12-month observation period. Tabulations are based on unweighted sample sizes of 302 congregate meal participants and nonparticipants.

TABLE 4: Differences in the most prevalent diagnoses underlying adverse events experienced by home-delivered meal participants and nonparticipants

Diagnosis	Percentage		
	Participants	Nonparticipants	Difference
Largest positive differences			
Genitourinary symptoms and ill-defined conditions	8.2%	0.3%	7.9
Mood disorders	7.2%	0.8%	6.3
Skin and subcutaneous tissue infections	5.3%	0.0%	5.3
Chronic ulcer of skin	3.4%	0.0%	3.4
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	4.3%	1.5%	2.8
Largest negative differences			
COPD	4.9	7.6	-2.7
Cardiac dysrhythmias	2.4	5.6	-3.2
Nonspecific chest pain	2.4	7.6	-5.3
Diabetes	6.0	12.0	-6.0
Hypertension	5.0	13.6	-8.6

Source: Medicare claims and enrollment data matched to AoA NSP outcomes survey, 2015–2016, weighted data.
Note: The most common diagnoses reported for individuals who experienced a hospitalization, emergency department visit, or home health episode in the 12-month observation period. Tabulations are based on unweighted sample sizes of 374 home-delivered meal participants and nonparticipants.

Most of these differences reflect the experiences of lower-income individuals. Among lower-income households, home-delivered meal participants were less likely than nonparticipants to be diagnosed with hypertension, diabetes, or cardiac dysrhythmias. Participants were more likely to have a primary diagnosis of genitourinary symptoms or mood disorders and to have a diagnosis of chronic skin ulcer. Participants in higher-income households generally had fewer large differences in types of diagnoses compared to nonparticipants; for example, participants and nonparticipants reported similar rates of genitourinary symptoms and mood disorders. There were a few exceptions; for example, among higher-income households, participants were more likely than nonparticipants to be diagnosed with skin infections and less likely to be diagnosed with nonspecific chest pain.

DISCUSSION

This brief identified the most common diagnoses for NSP participants experiencing adverse health events. Arthritis was the most frequent diagnosis for both congregate meal and home-delivered meal participants. Among congregate meal participants, other common diagnoses were respiratory diseases like COPD, chest pain, UTIs, dysrhythmias, and injuries. For home-delivered meal participants, the most common diagnoses after arthritis span a wide array of conditions including genitourinary symptoms, mood disorders, fractures, diabetes, injuries, and infections. Program administrators could consider incorporating health-promotion and disease-prevention activities related to common diagnoses into their programming to help participants manage their health conditions and mitigate risks involved with experiencing adverse health events.

The information presented in this brief complements the findings in a recent evaluation examining health care utilization by NSP participation. The evaluation found that congregate meal participants and nonparticipants had similar likelihood of experiencing an adverse health event such as a hospitalization, home health episode, or emergency department visit (Mabli et al. 2018). Although participants were not more or less likely than nonparticipants to experience these types of events, the types of diagnoses associated with these adverse health events differed between groups. Considering that congregate meal participants were more likely than nonparticipants to be diagnosed with nonspecific chest pain, UTIs, and respiratory diseases, health promotion activities provided by local sites should be assessed to ensure that participants receive information relevant to these diagnoses. At the same time, participants were less likely than nonparticipants to be diagnosed with arthritis, fractures, and open wounds, possibly reflecting the effectiveness of congregate meal sites' programming around falls prevention, or reflecting differences between participants and nonparticipants in their access to preventive care including fall prevention guidance. Learning more about whether NSP-eligible nonparticipants are aware of health promotion services offered through the NSP may improve program outreach and targeting and help to reduce the risk of fractures, wounds, and other consequences of falls.

The evaluation report found that home-delivered meal participants were more likely than nonparticipants to experience hospitalizations and emergency department visits (Mabli et al. 2018). These participants were also more likely than nonparticipants to be diagnosed with genitourinary symptoms, mood disorders, and skin infections and skin ulcers. Some of these types of diagnoses may be associated with lower mobility among homebound older adults. According to the evaluation report, more than 9 percent of home-delivered meal participants were chair bound, and about 2 percent were bed bound (Mabli et al. 2017). Infections and other acute primary diagnoses like pneumonia may be induced or exacerbated by secondary diagnoses, chronic conditions, and other illnesses or injuries that led participants to be homebound in the first place. AoA might consider offering NSP provider staff and meal delivery drivers additional education and training regarding how to effectively recognize signs of these diagnoses to help participants manage their health needs, or consider examining what health promotion services tailored to this population are available for dissemination. Participants were less likely than nonparticipants to be diagnosed with diabetes, hypertension, and nonspecific chest pain. Eligible nonparticipants could also benefit from targeted outreach and information about health services related to these diagnoses that the NSP provides as well as information about specialized meal deliveries. For example, the evaluation report found that about one in three home-delivered meal participants was on a special diet, and about 60 percent of those participants were on diabetic diets (Mabli et al. 2017). Promoting the availability of these types of specialized meal offerings to individuals currently not participating in the NSP may attract new older adults to the program and, in turn, help program administrators fulfill their mission of providing healthy meals and services to older adults in need.

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SUPPLEMENTAL TABLE 1: Differences in the prevalence of diagnoses underlying adverse events experienced by congregate meal participants and nonparticipants

Diagnosis	Percentage		
	Participants	Nonparticipants	Difference
Largest positive differences			
Nonspecific chest pain	9.4%	2.0%	7.4
UTI	9.1%	3.6%	5.4
COPD	9.9%	5.7%	4.2
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	4.6%	0.9%	3.7
Diabetes	4.4%	1.6%	2.8
Superficial injury; contusion	4.7%	2.3%	2.4
Conditions associated with dizziness or vertigo	3.9%	1.6%	2.3
Other aftercare	3.3%	1.0%	2.2
Congestive heart failure	3.4%	1.8%	1.6
Respiratory failure	4.5%	2.9%	1.5
Other nervous system disorders	2.1%	1.1%	0.9
Other liver diseases	0.0%	0.0%	0.0
Skin and subcutaneous tissue infections	1.9%	1.9%	-0.1
Other upper respiratory infections	0.7%	1.0%	-0.4
Other gastrointestinal disorders	3.2%	3.7%	-0.6
Genitourinary symptoms and ill-defined conditions	0.9%	1.6%	-0.7
Cardiac dysrhythmias	5.5%	6.3%	-0.8
Other injuries and conditions due to external causes	3.0%	4.0%	-1.0
Syncope	0.2%	1.2%	-1.1
Open wounds of head, neck, and trunk	0.6%	1.9%	-1.3
Sprains and strains	0.7%	2.1%	-1.3
Acute myocardial infarction	0.7%	2.2%	-1.6
Complications of surgical procedures or medical care	0.0%	1.6%	-1.6
Abdominal pain	1.7%	3.7%	-1.9
Acute and unspecified renal failure	0.1%	2.0%	-1.9
Other diseases of veins and lymphatics	0.4%	2.8%	-2.4
Hypertension	3.4%	5.8%	-2.4
Rheumatoid arthritis, osteoarthritis, and other connective tissue diseases	11.7%	16.6%	-5.0
Open wounds of extremities	1.6%	6.9%	-5.4
Fracture	4.5%	9.9%	-5.4

Source: Medicare claims and enrollment data matched to AoA NSP outcomes survey, 2015–2016, weighted data.
Note: The most common diagnoses reported for individuals who experienced a hospitalization, emergency department visit, or home health episode in the 12-month observation period. Tabulations are based on unweighted sample sizes of 302 congregate meal participants and nonparticipants.

SUPPLEMENTAL TABLE 2: Differences in the most prevalent diagnoses underlying adverse events experienced by home-delivered meal participants and nonparticipants

Diagnosis	Percentage		
	Participants	Nonparticipants	Difference
Largest positive differences			
Genitourinary symptoms and ill-defined conditions	8.2%	0.3%	7.9
Mood disorders	7.2%	0.8%	6.3
Skin and subcutaneous tissue infections	5.3%	0.0%	5.3
Chronic ulcer of skin	3.4%	0.0%	3.4
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	4.3%	1.5%	2.8
Superficial injury; contusion	5.5%	3.4%	2.2
Neoplasms of unspecified nature or uncertain behavior	1.6%	0.0%	1.6
Delirium, dementia, and amnestic and other cognitive disorders	1.3%	0.3%	1.1
Other nervous system disorders	2.8%	1.9%	0.9
Deficiency and other anemia	1.6%	0.7%	0.9
Late effects of cerebrovascular disease	1.7%	0.9%	0.9
Fracture	6.5%	6.0%	0.4
Other aftercare	2.1%	2.0%	0.1
Urinary tract infections	3.6%	3.6%	0.0
Rehabilitation care; fitting of prostheses; and adjustment of devices	0.0%	0.0%	0.0
Alcohol-related disorders	0.0%	0.0%	0.0
Other upper respiratory infections	1.1%	1.2%	-0.1
Other gastrointestinal disorders	2.4%	2.6%	-0.2
Pulmonary heart disease	0.1%	0.4%	-0.2
Sprains and strains	2.6%	3.0%	-0.3
Malaise and fatigue	0.9%	1.3%	-0.4
Congestive heart failure	4.3%	5.1%	-0.8
Other injuries and conditions due to external causes	0.4%	1.7%	-1.3
Rheumatoid arthritis, osteoarthritis, and other connective tissue diseases	8.6%	10.9%	-2.3
Abdominal pain	2.6%	5.1%	-2.4
COPD	4.9%	7.6%	-2.7
Cardiac dysrhythmias	2.4%	5.6%	-3.2
Nonspecific chest pain	2.4%	7.6%	-5.3
Diabetes	6.0%	12.0%	-6.0
Hypertension	5.0%	13.6%	-8.6

Source: Medicare claims and enrollment data matched to AoA NSP outcomes survey, 2015–2016, weighted data.
Note: The most common diagnoses reported for individuals who experienced a hospitalization, emergency department visit, or home health episode in the 12-month observation period. Tabulations are based on unweighted sample sizes of 374 home-delivered meal participants and nonparticipants.