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## Service Provision, Hospitalizations, and Chronic Conditions in Adult Day Services Centers: Findings From the 2016 National Study of Long-Term Care Providers

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### Abstract

*Introduction*—This report presents the most recent nationally representative percentages of adult day services centers (ADSCs) with hospitalizations and chronic conditions by service provision. Service provision may further one or two of the primary goals of adult day services: to reduce the risk of hospitalizations and readmissions, and manage chronic conditions among their participants.

*Methods*—Estimates are from the 2016 Adult Day Services Center survey in the biennial National Study of Long-Term Care Providers conducted by the National Center for Health Statistics. Service provision was measured using scales that included five types of services: mental health, social work, therapeutic (physical, speech, or occupational), dietary and nutritional, and skilled nursing. Provision methods included by employees only or a mix of employees, arrangement, or referrals; by arrangement or referrals; and not provided. The percentage of ADSCs with hospitalizations was measured by having at least one participant discharged from an overnight hospital stay in the past 90 days. The number of chronic conditions included the four most prevalent types of chronic conditions reported by ADSCs (Alzheimer disease and other dementias, diabetes, depression, and heart disease). Analyses included univariate and bivariate statistics showing the percentages of ADSCs with hospitalizations and chronic conditions by service provision.

*Results*—Although a little more than one-half of ADSCs (52.6%) provided all five services, approximately one-tenth of ADSCs provided none of the five services. About 64.0% of ADSCs had hospitalizations among participants. Almost 7 in 10 ADSCs (69.2%) reported the prevalence of all 4 conditions in their center. Approximately three-fourths (74.3%) of ADSCs that provided all five services had hospitalizations among participants compared with almost one-third of ADSCs (31.5%) that provided none of the services. Almost 83.0% of ADSCs that provided all five services had all four conditions in their center, compared with approximately one-third (31.5%) of ADSCs that provided none of the five services.

**Keywords:** home- and community-based services • long-term services and supports

### Introduction

In 2016, 286,300 participants were enrolled in 4,600 adult day services centers (ADSCs) nationwide in the United States (1). ADSCs are a growing home- and community-based sector of long-term care with a primary goal of helping individuals with chronic conditions and disabilities remain living in the community and preventing or delaying institutionalization (2).

As part of their goal to prevent or delay institutionalization, ADSCs offer a variety of services, including mental health; social work; physical, occupational, or speech therapy; dietary and nutritional; and skilled nursing. They typically provide these services in a variety of ways including by center employees, by arrangement with outside providers or contractors, or by referrals to outside providers. Some ADSCs may provide and coordinate services with a mix of all three methods of provision. By providing a variety of services through mixed methods of provision, ADSCs may better meet the diverse needs of their participants, and prevent them from having to obtain services elsewhere. However, not all ADSCs offer all (or any) services (1). Service provision supports long-term care users with chronic



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conditions and disabilities, and those who have had hospitalizations, and has been found to reduce the likelihood of readmissions (3).

Hospitalizations among older adults are a strong predictor of future institutionalization or nursing home admission, and are associated with health and disability declines, lower quality of life, and greater health care costs (4–6). The increased risks associated with hospitalizations are of particular concern to ADSCs, and reducing hospitalizations and readmissions is a main goal for ADSCs. A recent study found that home health patients who also participated in an ADSC had lower rates of hospitalizations (7). In 2016, 4% of ADSC participants had at least one hospitalization in a 90-day period (8).

Often ADSCs have participants with diverse health needs, including common chronic conditions, such as Alzheimer disease and other dementias, depression, diabetes, and heart disease. In 2016, 38% of ADSC participants were diagnosed with Alzheimer disease and other dementias, 30% with diabetes, 28% with depression, and 27% with heart disease (8). These chronic conditions have been found to be associated with hospitalizations and readmissions in long-term care settings (4,9,10). Having a participant case mix with several different chronic conditions may increase the need to provide a wider variety of services and to have staff with knowledge about a number of conditions.

Despite ADSCs' primary goals of reducing hospitalizations and readmissions and managing chronic conditions among participants, national estimates on the relationship between service provision and hospitalizations and chronic conditions are limited. This report fills this gap by presenting 2016 national estimates of the percentages of hospitalizations in the past 90 days and the number of chronic conditions among ADSCs, by service provision.

## Methods

### Data source

Data in this report are from the 2016 Adult Day Services Center survey,

which is a component of the biennial National Study of Long-Term Care Providers (NSLTCP), conducted by the National Center for Health Statistics (NCHS). The 2016 NSLTCP used a census of ADSCs in the National Adult Day Services Association's (NADSA) database. To be eligible for the 2016 survey, an ADSC must (a) have been included in the NADSA database and in operation as of November 2015; (b) be licensed or certified by the state specifically to provide adult day services, or accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF), or authorized or otherwise set up to participate in Medicaid, or part of a Program of All-Inclusive Care for the Elderly (PACE); (c) have an average daily attendance of one or more participants based on a typical week; and (d) have one or more participants enrolled at the center at the designated location at the time of the survey.

Respondents to the survey are ADSC administrators, directors, or otherwise knowledgeable ADSC staff. The survey was administered by mail, web, and Computer-Assisted Telephone Interviewing (CATI) follow up for nonrespondents. The 2016 NSLTCP had a response rate of 61.8%. For additional information about NSLTCP and ADSC survey methodology and variable construction, see the 2016 NSLTCP survey documentation (11,12). The 2016 NSLTCP data are accessible via restricted use only. Information on how to access the data are available from: [https://www.cdc.gov/nchs/nsltcp/nsltcp\\_rdc.htm](https://www.cdc.gov/nchs/nsltcp/nsltcp_rdc.htm).

### Measures

For service provision, respondents were asked to mark which of the services they provided and how they provided them, referred to in this report as provision method. Services included mental health, social work, therapeutic (including physical, speech, or occupational services), dietary and nutritional, and skilled nursing. The provision methods described in the survey included the following:

- arranges to be provided by outside service providers (arrangement);
  - refers participants or family to outside service providers (referral); and
  - does not provide by any of these methods (no provision).
- This report describes services in terms of number of services provided and how they were provided.
- A six-category service provision scale was initially constructed using the five services to measure the number of services provided, ranging from zero (does not provide any of the five services) to five (provides all of the five services). In addition, a category for provision of one to four services is shown.
- Another provision scale was constructed to measure how services were provided with the following four mutually exclusive categories:
1. all five services provided by employees;
  2. all five services provided by arrangement or referrals;
  3. none of five services provided; and
  4. the remaining adult day services centers.
- The “provided by employees” category includes services that are provided by employees only or by a mix of employees, arrangement, or referrals. This report focuses on provision of all five services because it was the most efficient way of collapsing the information, and in doing this, ADSCs that provide the most services can be described. The remaining ADSCs category includes those providing one to four of the services by any combination of employees, arrangement, referrals, and no provision.
- Hospitalizations were measured using an item that asked ADSCs how many of their currently enrolled participants were discharged from an overnight hospital stay in the past 90 days. Trips to the hospital emergency department that did not result in an overnight hospital stay were excluded. The number of 90-day hospitalizations across ADSCs ranged from 0 to 93 participants with the following distribution: 35.8% had 0 hospitalizations;
- provides by paid center employees (employee provision);

19.3% had 1 hospitalization; 14.8% had 2 hospitalizations; 8.9% had 3 hospitalizations; 4.8% had 4 hospitalizations; 5.8% had 5 hospitalizations; and 10.6% had 6 or more hospitalizations. A binary variable was constructed measuring whether or not the center had at least one participant with a hospitalization.

The number of chronic conditions in ADSCs was measured using an aggregated item that asked how many currently enrolled participants of the ADSC had been diagnosed with any of the following conditions: Alzheimer disease or other dementias, diabetes, depression, and heart disease. This center-level measure ranged from zero if a center indicated it had no participants with any of the four conditions to four if a center reported having all four chronic conditions represented across one or more participants. Across all ADSCs, 2.0% had zero conditions; 5.2% had one condition; 7.7% had two conditions; 15.4% had three conditions; and 69.2% had all four conditions. This measure was collapsed into two categories for this report: zero to three conditions and all four conditions because there were too few ADSCs in the zero, one, two, and three conditions for individual analyses. Constructing it this way allowed for the scaling of ADSCs from least to most number of chronic conditions in a center, indicating centers with more complex needs among their participant case mix.

## Analyses

Overall national estimates on service provision, hospitalizations, and number of chronic conditions are reported first as context. Then, the percentage of ADSCs with hospitalizations by service provision is presented. Finally, the number of chronic conditions by service provision is reported.

Analyses took into account the complex survey design of the 2016 NSLTCF. Weights were used to adjust for unknown eligibility status of nonresponding ADSCs and for nonresponse bias. Results are nationally representative. See the 2016 NSLTCF documentation for details about the weighting methods (11). Cases with missing data were excluded from the

analyses on a variable-by-variable basis, ranging from 8.9% for hospitalizations to 14.1% for diagnoses of heart disease. Data analyses were performed using the following statistical packages: SAS, version 9.3 (SAS Institute, Cary, N.C.) (13); SAS-callable SUDAAN, version 11.0.0 (RTI International, Research Triangle, N.C.) (14); and Stata/SE, version 14 (StataCorp, College Station, T.X.) (15). Statements of differences among subgroups are based on two-tailed chi-squared and *t* tests with significance at the  $p < 0.05$  level. If a chi-squared test was statistically significant, a *post hoc t* test procedure was used to make pairwise comparisons among subgroups. A weighted least-squares regression method was used to test the significance of linear trends. Statistically significant differences and trends are indicated in the figures and discussed in the “Results” section.

## Results

### Overall national estimates

Table 1 shows the percentage of ADSCs by service provision, the percentage of ADSCs with hospitalizations in the past 90 days, and

the percentage of ADSCs by number of chronic conditions.

- More than one-half of ADSCs (52.6%) provided all five services (Table 1).
- About 37.0% of ADSCs provided one to four of the five services, with 11.2% providing four of the five services, 9.2% providing three of the five services, 10.5% providing two of the five services, and 6.4% providing one of the five services.
- Approximately one-tenth of ADSCs (10.2%) provided none of the five services.
- Nearly one-tenth (8.4%) of ADSCs provided all of the five services with employees and 10.3% provided all of the five services by arrangement or referral.
- More than two-thirds of ADSCs (64.2%) had at least one hospitalization among their participants.
- Overall, 30.8% of ADSCs reported zero to three of the conditions in their center and 69.2% reported all four conditions.

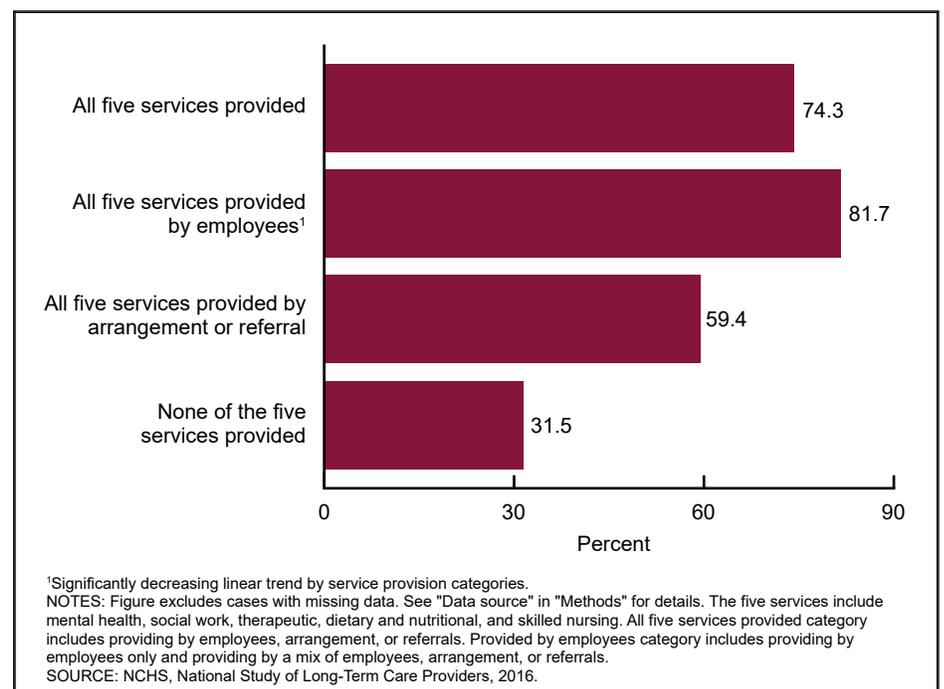


Figure 1. Percentage of adult day services centers with hospitalizations in the past 90 days, by service provision: United States, 2016

## Hospitalizations by service provision

Table 2 shows the percentage of ADSCs with hospitalizations by service provision. Figure 1 highlights these findings for the service provision methods.

- Almost three-fourths of ADSCs that provided all five services (74.3%) reported at least one hospitalization in the past 90 days.
- Almost one-third (31.5%) of ADSCs that provided none of the five services had hospitalizations.
- Among ADSCs that provided all five services with employees, 81.7% had hospitalizations compared with 59.4% of ADSCs that provided all five services by arrangement or referral.

## Number of chronic conditions by service provision

Table 3 shows the percentage of chronic conditions among ADSCs by number of chronic conditions and service provision. Figure 2 highlights findings for the service provision methods.

- Across ADSCs that provided all five services, 17.5% had zero to three of the four chronic conditions in their center and 82.5% had all four conditions.
- In ADSCs that provided none of the five services, 70.6% had zero to three of the four chronic conditions in their center and 29.4% had all four conditions.
- Among ADSCs that provided all five services with employees, 3.8% had zero to three of the four chronic conditions in their center and 96.2% had all four conditions.
- In ADSCs that provided all five services by arrangement or referral, 36.3% had zero to three of the four chronic conditions in their center and 63.7% had all four conditions.

## Conclusion

In summary, the majority of ADSCs (52.6%) provided all five services, and approximately 90.0% provided at least one service, showing a high level of service provision. However, about 10.0% of ADSCs provided none of these five services. A majority (64.2%) had at least one participant with a hospitalization

in the past 90 days. Almost 70.0% of ADSCs reported having all four chronic conditions (Alzheimer disease or other dementias, diabetes, depression, and heart disease) in their center, indicating that the majority of centers have a diverse set of health needs to meet. The percentage of hospitalizations was greatest (74.3%) for ADSCs providing all five services, especially in ADSCs providing all five services directly by employees (81.7%). Hospitalizations were lower among ADSCs that provided none of the five services (31.5%). As with hospitalizations, the percentage of all four conditions in an ADSC was highest in ADSCs that provided all five services (82.5%), particularly when all five services were provided by employees (96.2%), whereas this was lowest among ADSCs that provided none of the five services (29.4%).

The strength of this analysis includes the focus on the relationships among service provision, hospitalizations, and chronic conditions among a nationally representative sample of ADSCs. Despite these strengths, there were some limitations. The measurement of hospitalizations may be underrepresenting the actual percentage because of the timing of data collection, and the 90-day time period in the question. For example, an ADSC may have a current participant who has been hospitalized but has not yet been discharged and therefore not counted in the hospitalizations measure. Between 9% and 14% of ADSCs were excluded from the study because of missing data. In analyses comparing the included with the excluded, the two groups differed significantly for hospitalizations, all five services, and prevalence of diabetes. This could result in bias in the results. The 2016 NSLTCP survey has aggregated participant characteristics, and so it is impossible to assess co-morbidity (one or more conditions) at the participant level. Finally, due to the cross-sectional nature of the survey, causality cannot be inferred from the findings.

This report demonstrates that ADSCs with greater levels of participant needs, as indicated by increased hospitalizations and the number of chronic conditions, are more likely to provide a greater number of services in general and these services

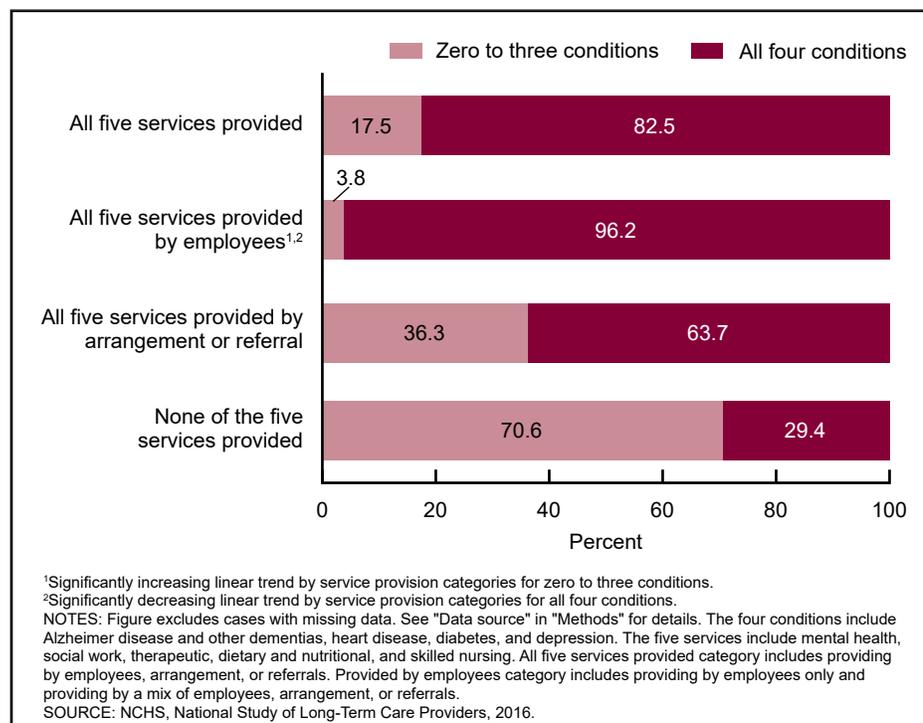


Figure 2. Percentage of adult day services centers, by number of chronic conditions and service provision: United States, 2016

are more often provided by employees and not solely by arrangement or referral. The level of participant needs, as indicated by hospitalizations, and chronic conditions among participants, were lower in ADSCs that provided select services by arrangement or referrals and in ADSCs that did not provide select services.

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**Table 1. Service provision, hospitalizations in the past 90 days, and number of chronic conditions in adult day services centers: United States, 2016**

Service provision scale	Percent	Standard error
Number of services		
Provides all five . . . . .	52.6	0.6
Provides one to four . . . . .	37.3	0.6
Provides four of five . . . . .	11.2	0.4
Provides three of five . . . . .	9.2	0.4
Provides two of five . . . . .	10.5	0.4
Provides one of five . . . . .	6.4	0.3
None of five provided . . . . .	10.2	0.4
How service is provided		
All five provided by employees . . . . .	8.4	0.4
All five provided by arrangement or referral . . . . .	10.3	0.4
None of five provided . . . . .	10.2	0.4
Remaining adult day services centers . . . . .	71.2	0.6
Hospitalizations in past 90 days		
Yes . . . . .	64.2	0.6
No . . . . .	35.8	0.6
Number of chronic conditions		
Zero to three . . . . .	30.8	0.5
All four . . . . .	69.2	0.5

NOTES: Percentages are rounded to the nearest tenth; estimates may not add up to totals because of rounding. The four conditions include Alzheimer disease and other dementias, heart disease, diabetes, and depression. The five services provided include mental health, social work, therapeutic, dietary and nutritional, and skilled nursing. Provides all five services category includes provided by employees, arrangement, or referrals. Provided by employees category includes providing by employees only and providing by a mix of employees, arrangement, or referrals. Remaining adult day services centers category includes those providing one to four services by a mix of employees, arrangement, referrals, and no provision.

SOURCE: NCHS, National Study of Long-Term Care Providers, 2016.

**Table 2. Percentage of adult day services centers with hospitalizations in the past 90 days, by service provision: United States, 2016**

Service provision scale	Hospitalizations in past 90 days (percent)		Standard error
	Yes	No	
Number of services			
Provides all five . . . . .	74.3	25.7	0.7
Provides one to four . . . . .	59.6	40.4	1.0
Provides four of five . . . . .	64.0	36.0	1.8
Provides three of five . . . . .	59.1	40.9	2.0
Provides two of five . . . . .	59.8	40.2	2.0
Provides one of five . . . . .	52.3	47.7	2.6
None of five provided . . . . .	31.5	68.5	2.0
How service is provided			
All five provided by employees . . . . .	81.7	18.4	1.9
All five provided by arrangement or referral . . . . .	59.4	40.6	1.9
None of five provided . . . . .	31.5	68.5	2.0
Remaining adult day services centers . . . . .	67.9	32.1	0.7

NOTES: The five services include mental health, social work, therapeutic, dietary and nutritional, and skilled nursing. Provides all five services category include providing by employees, arrangement, or referrals. Provided by employees category includes providing by employees only and providing by a mix of employees, arrangement, or referrals. Remaining adult day services centers category includes those providing one to four services by a mix of employees, arrangement, referrals, and no provision.

SOURCE: NCHS, National Study of Long-Term Care Providers, 2016.

**Table 3. Percentage of adult day services centers, by number of chronic conditions and service provision: United States, 2016**

Service provision scale	Number of chronic conditions (percent)		Standard error
	Zero to three	All four	
Number of services			
Provides all five . . . . .	17.5	82.5	2.0
Provides one to four . . . . .	40.4	59.7	1.1
Provides four of five . . . . .	33.2	66.8	2.7
Provides three of five . . . . .	38.4	61.6	2.1
Provides two of five . . . . .	44.4	55.6	2.1
Provides one of five . . . . .	50.0	50.0	1.8
None of five provided . . . . .	70.6	29.4	0.7
How service is provided			
All five provided by employees . . . . .	3.8	96.2	0.9
All five provided by arrangement or referral . . . . .	36.3	63.7	2.0
None of five provided . . . . .	70.6	29.4	2.0
Remaining adult day services centers . . . . .	28.2	71.8	0.7

NOTES: The four conditions include Alzheimer disease and other dementias, heart disease, diabetes, and depression. The five services include mental health, social work, therapeutic, dietary and nutritional, and skilled nursing. Provides all five services category includes providing by employees, arrangement, or referrals. Provided by employees category includes providing by employees only and providing by a mix of employees, arrangement, or referrals. Remaining adult day services centers category includes those providing one to four services by a mix of employees, arrangement, referrals, and no provision.

SOURCE: NCHS, National Study of Long-Term Care Providers, 2016.

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